is a clear case of 'project splitting' and the EPA Guidelines make reference to Case Law from the Court of Justice of the European union (CJEU) pointing to this fact.

The inclusion of the pending application to remove the 32m cap is very significant as ABP applied the 32m cap when granting the Terminal 2 planning permission (PL06F.220670) and having regard for transport capacity constraints.

Capacity

3. The combined capacity of Terminal 2 as permitted together with Terminal 1 shall not exceed 32 million passengers per annum unless otherwise authorised by a further grant of planning permission.

Reason: Having regard to the policies and objectives of the Dublin Airport Local Area Plan and capacity constraints (transportation) at the eastern campus.

REASONS AND CONSIDERATIONS (2)

The proposed development of Phase 2 of the terminal building would be premature pending the determination by the road authority of the detailed road network to serve the area and the commitment by the planning authority to design and fund all the external transport elements detailed in the Environmental Impact Statement to facilitate Phase 2. In these circumstances, to expand further the terminal capacity at this location would contravene the objectives EA2, EA3 and TP10 of the Dublin Airport Local Area Plan which seek to provide balanced road infrastructure to manage traffic and to cater for the comprehensive development of the airport.

Section 9 of the EIAR is titled 'Traffic & Transport'. This section only includes passenger numbers up to 32m. Maintaining a 32m cap up to 2035 goes against the aims of the National Aviation Policy for Ireland. This is a serious flaw and reflects the 'project splitting' nature of the application. Failure to take account of the impact of future Transport needs invalidates this planning application and therefore FCC should refuse the application on these grounds alone.

Table 9-1 Assessment Scenarios and forecast passenger growth

	2022		2025		2035	
	Permitted	**Proposed**	**Permitted**	**Proposed**	**Permitted**	**Proposed**
Flight Profile	Without RA	With RA	Without RA	With RA	Without RA	With RA
mppa	19.6	21	30.4	32	32	32

9.9 F19A/0449

With reference to F19A/0449, ANCA failed to define the NAO for Dublin Airport after starting the process. ANCA requested noise information from the daa under section 9(10) of the 2019 Act (https://www.fingal.ie/sites/default/files/2019-12/anca-rf01.pdf):

Accordingly, ANCA is now engaged in the process of consultation with the Planning Authority, determining whether the development the subject of F19A/0449 would give rise to a noise problem, in accordance with Section 34B(2) of the PDA.

To assist in making that determination, ANCA is exercising its power to request information under Section 9(10) of the 2019 Act, which provides that ANCA may, for the purposes of an assessment of the noise situation at the airport, direct the applicant to provide ANCA with such information as ANCA may reasonably require. As you are aware, assessment of the noise situation at the airport is one of ANCA's functions under Section 9(1) of the 2019 Act, which is incorporated into the Section 34B process under Section 34B(1)(b) of the PDA.

Appendix A to this letter outlines the specific information sought from daa at this point in the Section 34B process. This information is required to enable ANCA to, in the first instance:

- assess the noise situation at the airport;
- determine whether the proposed increase in the Capacity Limit would give rise to a 'noise problem'; and
- potentially inform the process of setting a Noise Abatement Objective (NAO) for Dublin Airport.

The application was withdrawn by the applicants in June 2020:

Dear Mr Mahon

RE: APPLICATION FOR PLANNING PERMISSION FOR A CHANGE OF USE TO PROVIDE FOR AN INCREASED COMBINED PASSENGER CAPACITY FOR ALL PASSENGER BUILDINGS FROM 32 MILLION PASSENGERS PER ANNUM (MPPA) TO 35 MPPA (OF WHICH 3 MPPA WILL BE CONNECTING PASSENGERS) IN THE TOWNLANDS OF CORBALLIS AND COLLINSTOWN, AT DUBLIN AIRPORT, CO. DUBLIN

FCC Reg Ref: F19A/0449

We refer to the above application and your most recent correspondence dated 9th April 2020. We wish to advise that daa plc has determined that the proposed increase in passenger capacity for all passenger buildings from 32mppa to 35mppa is no longer required in the short term. This is due to the recent impacts of Covid-19 on the number of passengers expected to utilise Dublin Airport over the next 12 – 24 months. As a result, we have advised the planning authority that the planning application is withdrawn pursuant to article 37(1) of the *Planning and Development Regulations 2001 – 2019*.

Future growth in passenger numbers at the airport will continue to be planned for in the long term and a subsequent planning application will be submitted to the planning authority in due course.

I trust that the above is in order and would appreciate a letter of acknowledgement.

Yours sincerely

Gavin Lawlor
Director
Tom Phillips + Associates

After the withdrawal of the application, ANCA decided to discontinue their role in assessing the noise situation at the airport and defining the Noise Abatement Objective (NAO). ANCA had the powers to continue their work and request any noise data from the daa but declined. Querying this decision, ANCA replied on July 15th stating that the data received from the daa was insufficient to facilitate a full assessment of the noise situation:

I refer to your correspondence of 5th July 2020.

I can confirm that planning application F19A/0449 has been withdrawn by the daa. Although the aircraft data as submitted by the airport authority as part of the planning application was informative, it was not sufficient to facilitate a full assessment of the noise situation at the airport. ANCA requested detailed additional information but a response to the request was not received in advance of the application being withdrawn. This information is on the planning section of our website. Notwithstanding this, it is the intention of ANCA that a full aircraft noise assessment will be undertaken for Dublin Airport. I do not have a date for the assessment at this time but can advise that there will be no pre-determined outcome.

There is currently no noise abatement objective for Dublin Airport. ANCA has, however, commenced a review of the noise mitigating measures at the airport under Section 21 of the Aircraft Noise (Dublin Airport) Regulation Act 2019. The outcome of this review will be posted on our website when available. As advised in previous correspondences, a request from you under Section 21(3)(a) can only be progressed when a noise abatement objective is in place at the airport.

Kind regards

Joe Mahon

Aircraft Noise Competent Authority
Fingal County Council | County Hall | Swords | County Dublin, K67 X8Y2

ANCA failed to continue the work of defining the Noise Abatement Objective for Dublin Airport even though it had the powers under section 9(10) of the Act to request the daa to provide any

data it required. It is very apparent that ANCA did not want to define the NAO unless there was a planning application lodged by the daa. And one can deduce that ANCA did not want to define the NAO before any planning application was lodged as it might jeopardise the daa's future activities. This action calls into question the true independence of ANCA and raises concerns over a conflict of interest.

9.10 INBOUND TOURISM VERSUS OUTBOUND TOURISM

In the CSO statistics on tourism (https://www.cso.ie/en/releasesandpublications/ep/p-syi/statisticalyearbookofireland2020/tt/tourism/) it states that €8.3bn was spent on overseas trips in 2019 by Irish residents.

In contrast, €5.1bn was spent by overseas residents in Ireland in 2019:

"*Excluding fares, expenditure by overseas travellers decreased by 0.9% in 2019, from €5,149 million in 2018 to €5,101 million. Of this €5,101 million, 60.3% was spent by overseas travellers for holiday/leisure/recreation purposes, 17.8% by those travelling to visit friends and relatives, 14.1% by business travellers and the remaining 7.8% by those travelling for 'Other' reasons*".

This equates to a net loss in tourism in 2019 of €3.2bn. From 2014 to 2019 there have been tourism deficits. One can assume that this pattern of losses will continue into the future. These losses facilitated by aviation have not been factored into the daa's or ANCA's Cost Effective Analysis. The analysis provided only factors in the positive effects of inbound tourism and ignores the negative effects of outbound tourism, facilitated by aviation.

10.0 SCENARIO P02 FAILS TO MEET THE NAO

10.1 SUMMARY

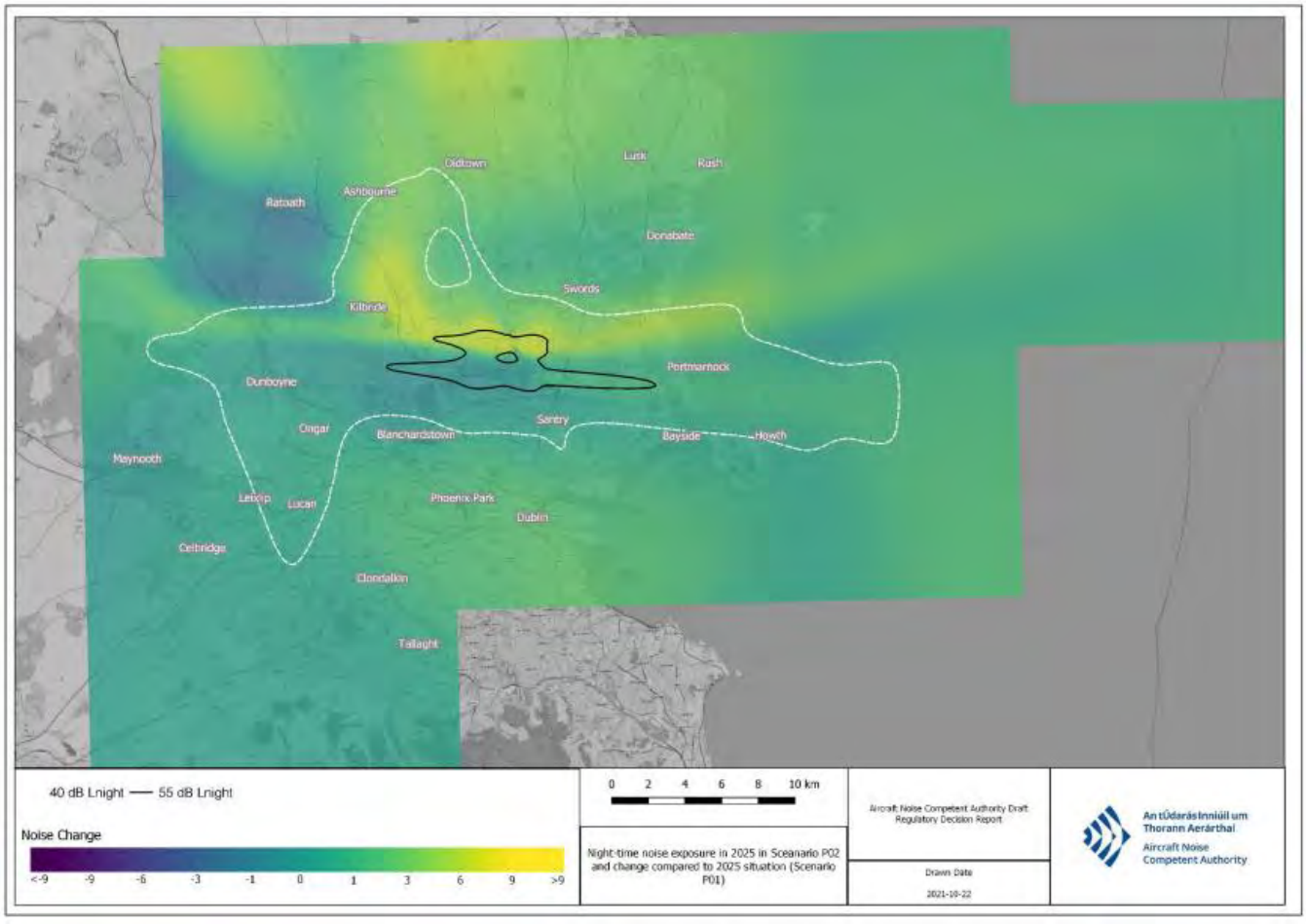
- Scenario P02 does not meet the NAO when taking population growth into account.
- Scenario P11 has just an increase of 2 people contained in the >55dB Lnight contour compared with 2019. This is well within the margins of error of the forecasts and should not be excluded from further analysis.
- ANCA used population with growth to dismiss scenario P11 yet attempted to ignore population with growth to justify the inclusion of P02.
- Night noise imposed on new populations from the North Runway for only a gain of 2 extra flights between 06:00-08:00 and 4 between 22:00-24:00, as outlined in the daa's forecasts.
- Scenario P11 shows less night-time impact than P02 and has lower numbers of HSD and HA.
- Including P02 and excluding P11 is not a Balanced Approach!

10.2 COMPARISON OF SCENARIO P02 AND SCENARIO P11

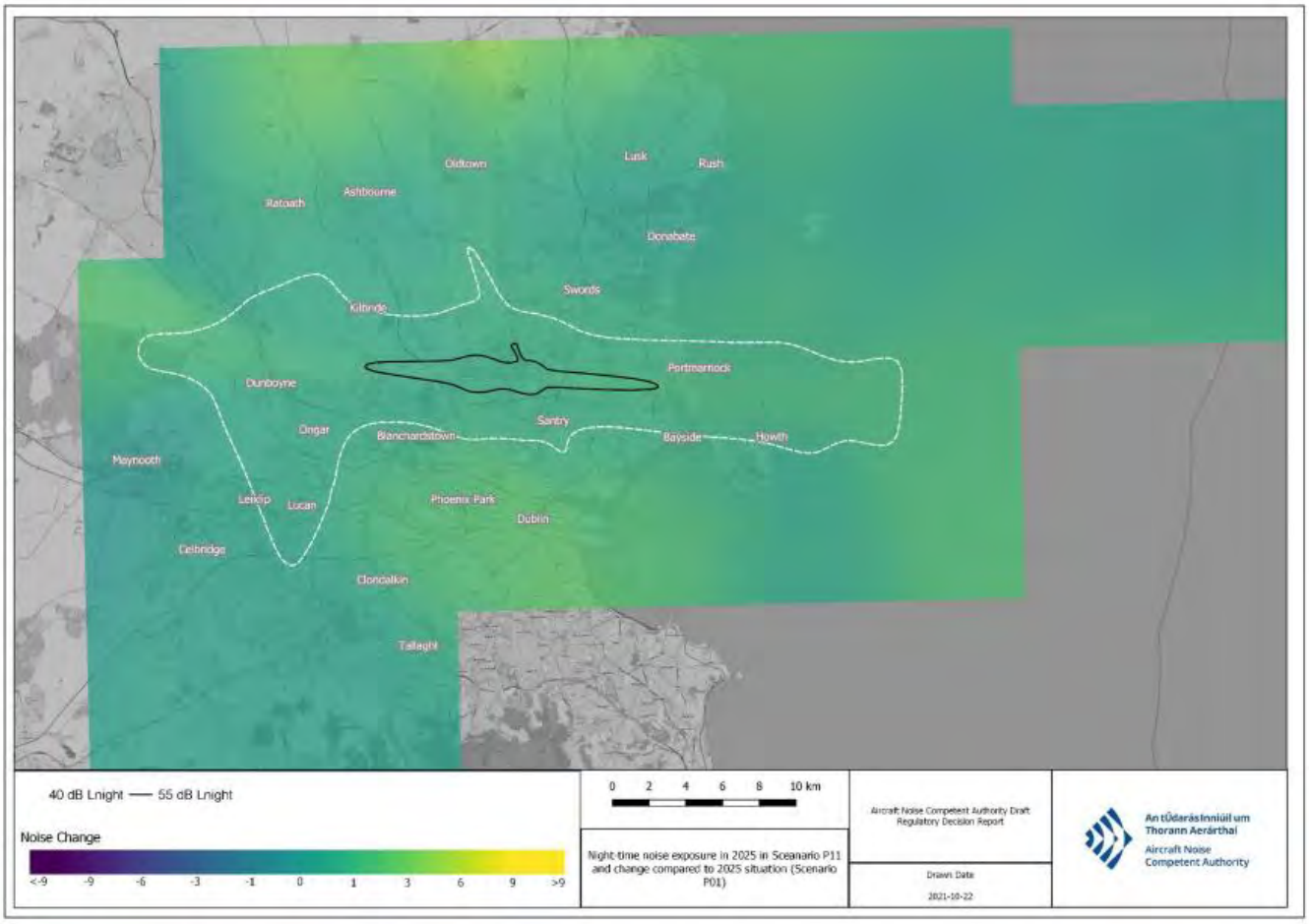
ANCA looked at a comparison of scenario P02 with P11. Scenario P02 is equivalent to the daa's Relevant Action proposal. Scenario P11 is equivalent to replacing Condition 5 with a NQS but leaving Condition 3(d) in place. This equates to having unlimited night-time flights on the South Runway only and no night-time flights on the North Runway.

Comparing the difference maps between scenarios 02 and 11 with scenario 01 (Permitted) one can see that scenario P11 causes no significant changes in noise exposure and a scenario that that ANCA should favour.

Scenario P02 introduces whole new populations to night-time noise for the first time, primarily in Malahide, Swords, St Margarets, The Ward and Coolquay



Draft Regulatory Decision – Appendix E (https://www.fingal.ie/sites/default/files/2021-11/appendix-e.pdf)



Draft Regulatory Decision – Appendix E (https://www.fingal.ie/sites/default/files/2021-11/appendix-e.pdf)

Effectively no new populations will be exposed to new levels of noise with scenario P11. This is an outcome that ANCA should be aspiring to achieve.

ANCA provided the population numbers for the different scenarios in terms of significant adverse effects but failed to include scenario P11 in table 7.22 of their Regulatory report:

Table 7.22: Population experiencing significant adverse effects due to changes in night time noise exposure in 2025

Scenario	Population Experiencing Significant Night time Noise Effects in 2025 arising from changes in aircraft noise exposure as per the EIAR significance criteria[121]
2025 P01 30.4 mmpa	0
2025 P02 32.0 mppa	1,879
2025 P03 32.0 mppa	3,677
2025 P04 32.0 mppa	23,414
2025 P05 32.0 mppa	17,547
2025 P07 32.0 mppa	17,050
2025 P08 32.0 mppa	4,629
2025 P09 32.0 mppa	14,984
2025 P10 32.0 mppa	22,379

It is also of significance that scenario P11 was omitted from the '*a11267_19_ca437_2.0-summary-of-results-including-mitigation.xls*' spreadsheet which was requested by ANCA to compare the various scenarios in terms of HSD, HA, >55dB Lnight, >65dB Lden and numbers significantly adversely affected by noise.

ANCA used the number of people >55dB Lnight to rule out scenario 11. But their analysis is flawed.

Here are the metrics for the NAO:

Expected Outcomes

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

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

- The number of people highly sleep disturbed and highly annoyed in 2030 shall reduce by 30% compared to 2019;
- The number of people highly sleep disturbed and highly annoyed in 2035 shall reduce by 40% compared to 2019
- The number of people highly sleep disturbed and highly annoyed in 2040 shall reduce by 50% compared to 2019 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.

Note there is no year or percentage reduction linked to >55dB Lnight and 65dB Lden. The numbers need to be reduced compared to 2019.

The Draft Regulatory Decision document focuses on >55dB Lnight and HSD only. In Fig 7.14 it shows the >55dB Lnight and >65dB Lden figures for 2025 for all the scenarios vs 2019.

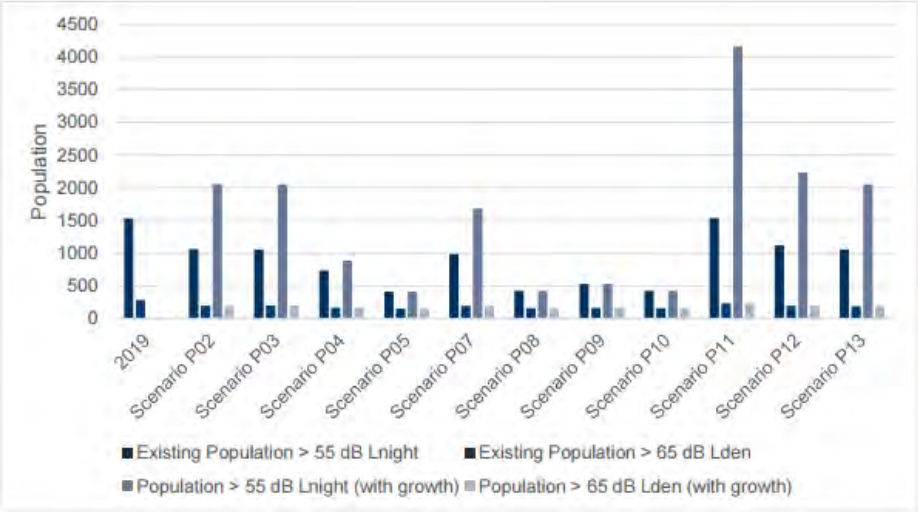


Figure 7.14: Population exposed to levels above the NAO priorities under different runway use and restriction scenarios with and without potential population growth

Scenario P11 exceeds 2019 when population growth is taken into account. Population growth is made up of future occupied, future consented planning and future zonings.

ANCA then compares future years to highlight the scenarios that exceeds >55dB Lnight in 2025/2030/2035/2040 with population growth. P11 exceeds the 2019 figure but so too does P02, the daa's proposal.

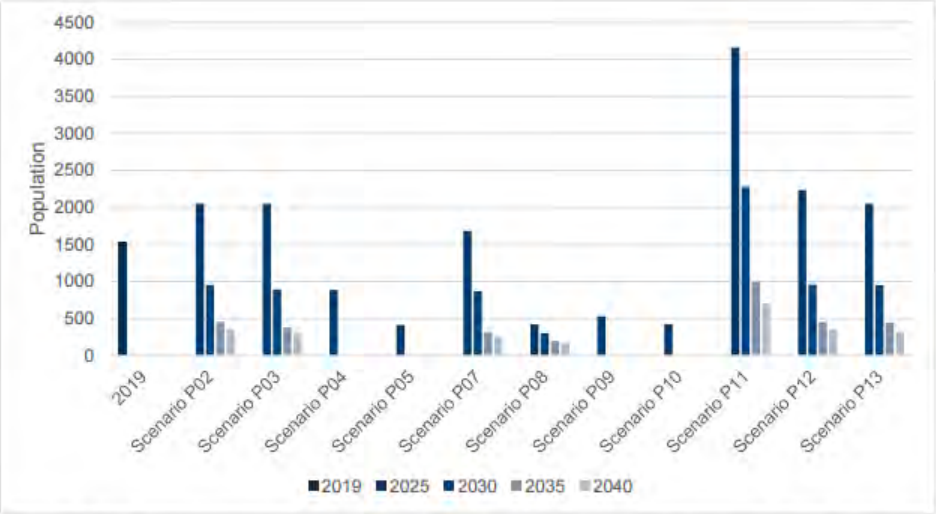


Figure 7.15: Population exposed to levels above the NAO night time priority of 55 dB L_{night} under different runway use and restriction scenarios with potential population growth over the period 2025 to 2040

P02 fails to meet the NAO when using population growth.

In the Regulatory decision on page 145, ANCA state:

"*The population growth assumptions utilised by the Applicant are documented. What is important to note is that these are estimates only and rely on an analysis of permitted developments and allocating lands zoned for residential development with an assumed number of dwellings and population per hectare. In preparing the analysis presented in Figure 7.15 above, it has been assumed that all forecast population growth has already occurred. ANCA's view is that this is unlikely to have occurred by 2025 but that it may have occurred by*

2030. For this reason, ANCA has not ruled out any scenario which exceeds the night time priority in 2025 when accounting for potential population growth except for Scenario P11.

It is important to note that any zoned land which is exposed to night time aircraft noise of above 55 dB Lnight would need to be subject to a planning application and a noise assessment with the specification of appropriate sound insulation. This is a requirement under Variation No. 1 of the County Development Plan. As such, the population which may be exposed to aircraft noise above the night time priority in the future will be influenced by planning decisions."

ANCA appear to be stating that with future zoned land, mitigation will be attached as a planning condition and therefore the population will not be affected. Variation No. 1 of the Fingal Development Plan 2017-2023 was adopted on December 9th, 2019. Therefore, it is a safe assumption that most of the Future Consented population will have mitigation attached to their planning conditions also.

ANCA have tried to use future population growth to remove P11, but P02 fails to meet the NAO too. Arguments are then made that the future population growth will not occur by 2025 and so P02 is not dismissed.

ANCA should be focused on the dwellings that are exposed to >55dB Lnight and have not had insulation installed as a mitigation measure. Why dismiss P11 due to population growth when mitigation in the form of insulation has been inserted as a planning condition?

The population growth figures that were supplied by the daa are broken down into:

- Future Occupied
- Future Consented
- Future Zoned

Totals	2018	2019	2025 Forecast	2025 Scen 02	2025 Scen 11	2030 Forecast	2030 Scen 02	2030 Scen 11	2035 Forecast	2035 Scen 02	2035 Scen 11	2040 Forecast	2040 Scen 02	2040 Scen 11
>55 Lnight	753	**1533**	280	1059	1535	243	756	1162	203	454	680	184	354	511
>55 Future Occupied	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>55 Future Consented	197	825	0	394	825	0	197	515	0	0	318	0	0	197
>55 Future Zoned	0	1800	0	600	1800	0	0	600	0	0	0	0	0	0
	950	**4158**	**280**	**2053**	**4160**	**243**	**953**	**2277**	**203**	**454**	**998**	**184**	**354**	**708**

In Fig 7.14 ANCA do not show the population growth for 2019, just the actual figure at that time which was 1533.

The top row in the table above is a comparison of >55dB Lnight exposure without population growth. Scenario P11 is 1535 which is just 2 people above the 2019 level and well within the tolerance of error with forecasts. Being above the 2019 figure by just 2 people should not be used as a mechanism to dismiss scenario P11.

In table 7.21 of the Regulatory Decision, it compares HSD and HA along with >55dB Lnight and >65dB Lden for the various scenarios. It is evident that P11 has lower HSD and HA than P02 (daa's proposal).

Table 7.21: Population HSD, HA and exposed above the NAO priorities in 2019 and in 2025 for the modelled runway use and restriction scenarios

Scenario	Population HSD	Population > 55 dB L_{night}	Population HA	Population > 65 dB L_{den}
2019 Situation	47,045	1,533	115,738	285
2025 P01 30.4 mmpa	22,500	280	64,241	119
2025 P02 32.0 mppa	37,080	1,059	79,405	196
2025 P03 32.0 mppa	35,757	1,055	77,962	201
2025 P04 32.0 mppa	35,260	737	78,838	167
2025 P05 32.0 mppa	36,363	412	78,774	151
2025 P07 32.0 mppa	36,699	989	78,921	192
2025 P08 32.0 mppa	35,784	422	78,301	161
2025 P09 32.0 mppa	34,896	528	77,553	163
2025 P10 32.0 mppa	36,463	426	78,686	158
2025 P11 32.0 mppa	35,799	1,535	77,630	236
2025 P12 32.0 mppa	37,159	1,119	79,641	199
2025 P13 32.0 mppa	36,275	1,055	78,606	189

In fact, P02 has one of the highest combinations of HSD and HA figures of all scenarios

The bottom row is the totals including population growth. 2025 scenario 02 (daa's proposal) is 2053 which is higher than 1533 in 2019 and therefore fails the NAO.

But ANCA state that it is unlikely the growth will have happened by 2025 and therefore do not exclude scenario P02. But this very same reason was used by ANCA to exclude P11.

Growth was used to dismiss P11 but not P02. This highlights the flaws in ANCA's analysis and illustrates how they have manipulated the logic to arrive at their desired outcome which facilitates the daa.

ANCA also state that the Zoned lands will be subject to planning permission. Therefore, planning will either be refused, or insulation required to mitigate against it. So why would ANCA use the Zoned numbers in this analysis?

The status of the 'consented' lands is also an unknown, as they could have received permission after Variation #1 of the Fingal Development Plan came into being, which

introduced the new Noise Zones, and therefore may have insulation required as part of any planning application and so these figures could also be excluded.

It is apparent that ANCA have set out with the intent to exclude P11 rather than consider it on its own merits. A proper analysis of the Zoned and Consented figures is required before ruling out P11.

In the Chapter titled 'Conditions 3(a)-3(d)', evidence is provided that the daa failed in their application to justify the need for dual departures between 06:00–08:00. ANCA have also failed to explain this in their regulatory decision and have provided no proof that they have forensically analysed the flight prediction data. Large populations of Fingal and Dublin West will be newly exposed to serious adverse night-time health effects from the North Runway for just 2 extra flights in the period 06:00–08:00 and 4 extra flights in the period 22:00–24:00, when comparing 2025 Proposed with 2025 Permitted.

There is not a strong enough case to exclude scenario P11 (South Runway for all night-time flights and leaving Condition 3(d) in place). The difference in exposure levels compared to 2025 Permitted would be minimal. P11 is a more preferable outcome than annoying a huge new cohort of the population for no benefit.

In section 7.6.11.3 of the Regulatory Report, ANCA discuss the forecasts beyond 2025 and without the 32m cap in place. ANCA state that this is not part of the planning application, but it is part of the wider growth policy for Dublin Airport. ANCA's analysis shows that the daa's proposal P02 will fail the NAO in 2030 with the anticipated increase in passenger numbers. P02 will only achieve 26.8% reduction in HSD numbers and thus fail the NAO. In comparison, P11 would reduce the HSD numbers by 33.2%.

The HSD and HA metrics were introduced by EU directive 2020/367 which amends Annex III of directive 2002/49/EC. These are used to assess the harmful effects of noise and therefore should be given priority status in this assessment.

In this assessment P11 has lower HSD and HA figures than P02. And P02 fails the NAO in 2030 with regard to HSD numbers when future passenger growth and population growth are factored in.

What is also evident is that scenario P01 (situation – keeping Conditions 3(d) and 5) has far lower HSD and HA numbers than P02:

Table 7.21: Population HSD, HA and exposed above the NAO priorities in 2019 and in 2025 for the modelled runway use and restriction scenarios

Scenario	Population HSD	Population > 55 dB L_{night}	Population HA	Population > 65 dB L_{den}
2019 Situation	47,045	1,533	115,738	285
2025 P01 30.4 mmpa	22,500	280	64,241	119
2025 P02 32.0 mppa	37,080	1,059	79,405	196

P01 has been effectively disregarded in this assessment and the focus has been on best alternatives. P01's HSD numbers are 39.3% lower than the daa's proposal P02. And P01's population >55dB Lnight is roughly one quarter that of P02's.

P01 is the best option to achieve the NAO in all circumstances. P01 will reduce the HSD value by 51% in 2030 even when including population growth and future passenger numbers beyond the 32m cap.

Section 6.62 of the SEA report visually compares scenarios P02 and P11. In section 6.60 it states:

"6.60 In terms of the alternatives to Condition 3(d), Alternative (v) (i.e. runway use pattern P11) is likely to have a negligible effect on protected sites and species, as with aircraft expected to operate as currently (with just the increase in night flights associated with lifting Condition 5) the overall level of noise will increase very slightly everywhere (i.e. for all of the designated sites within the ZoI), as shown in Figure 5.1. In contrast, the changes to operations associated with each of the other runway use patterns result in a much greater level of noise (of up to 9.5 dB) occurring along the descent and take-off routes of the North Runway as night-time flights begin to operate from here, and a potential reduction in noise (of up to 1.5 dB) along the descent and take-off routes of the South Runway as some of these flights are moved to the North Runway. These are also shown in Figure 5.1, with runway use pattern P02 shown for Alternative (vi), and Alternatives (vii) and (viii) represented by runway use patterns P13 and P04 respectively".

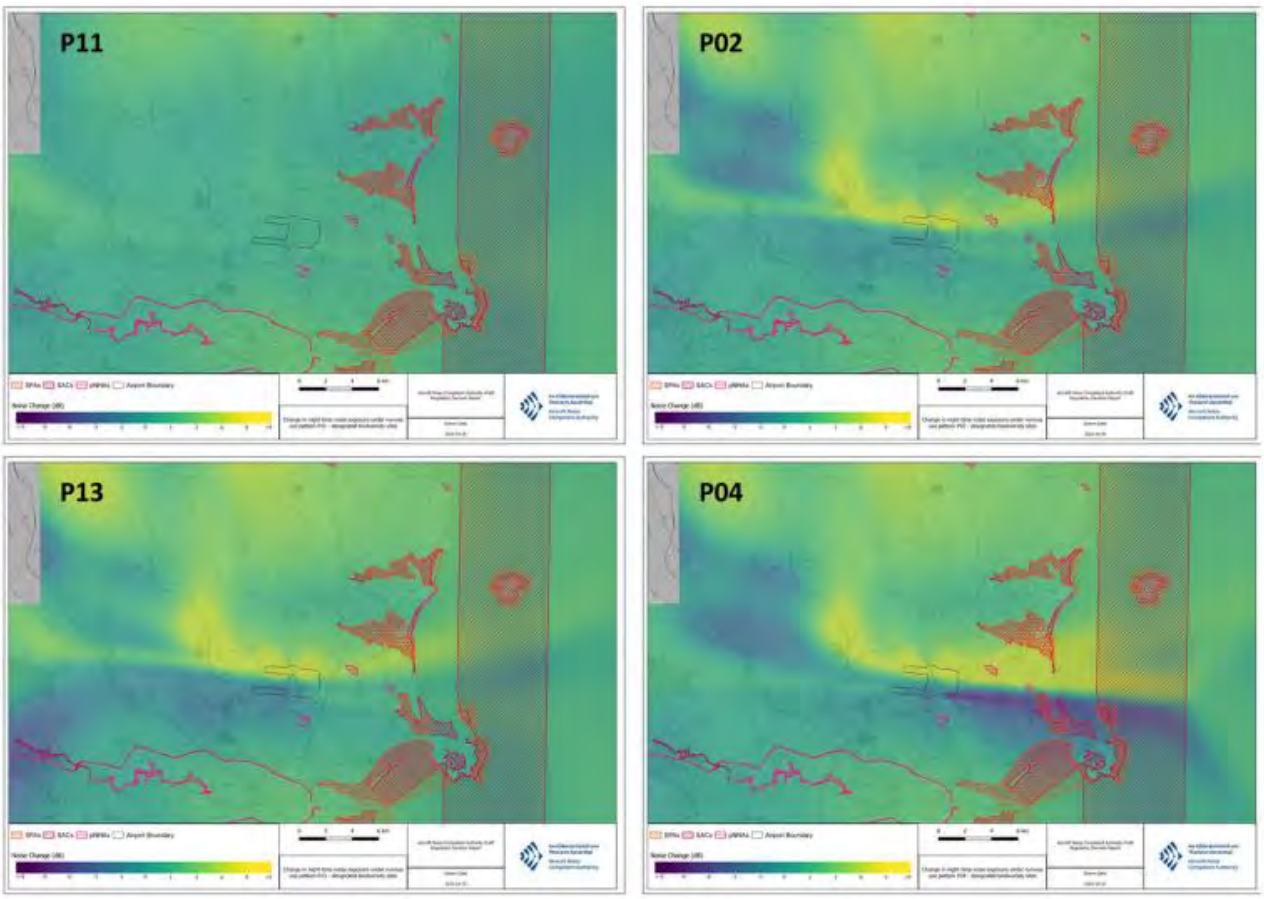


Figure 5.1 – Change in night-time noise exposure of RD Alternatives (v), (vi), (vii) and (viii) (represented by runway use patterns P11, P02, P13 and P04) at designated nature conservation sites in the vicinity of Dublin Airport

11.0 APPROPRIATE ASSESSMENT

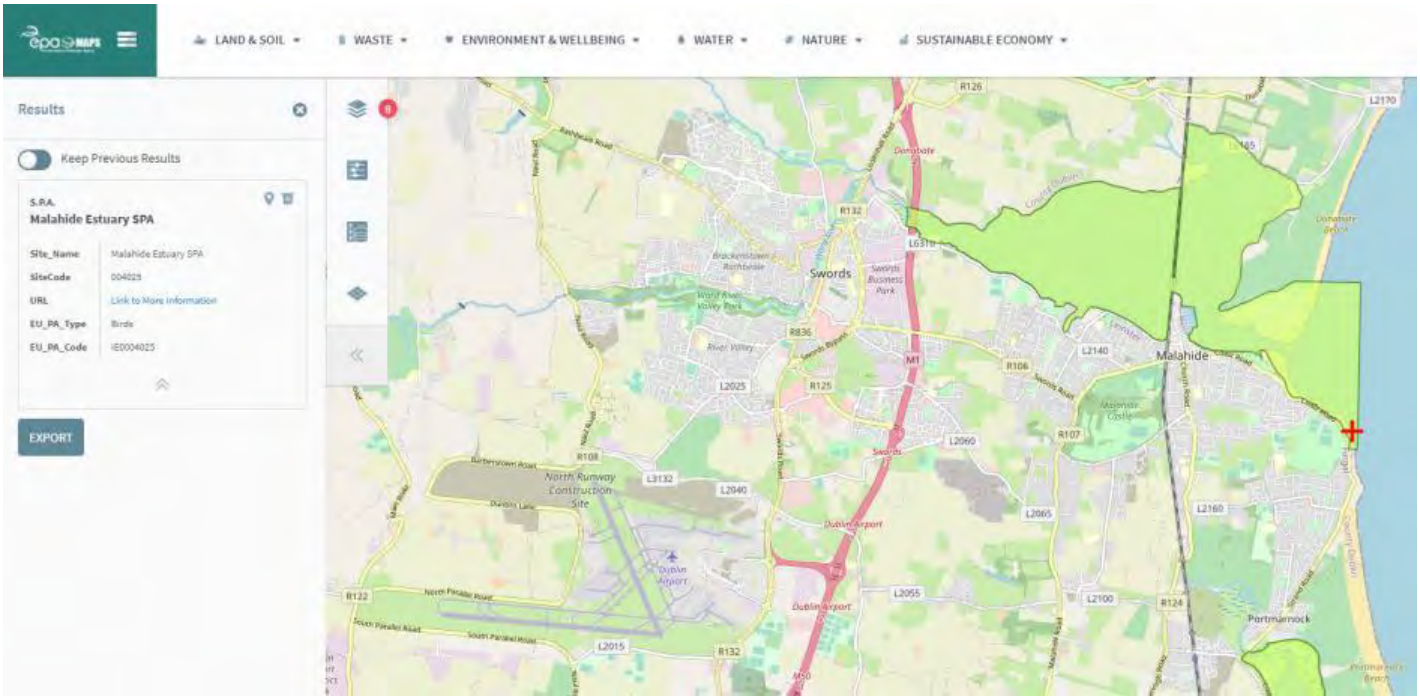
11.1 SCREENING REPORT

Under the Habitats Directive, EU member states are required to designate SACs for habitats listed in Annex I and Annex II of the Directive.

Under the Birds Directive, EU member states are required to identify and classify SPAs for rare or vulnerable species listed on Annex I of the Directive, as well as for all regularly occurring migratory species.

The screening report incorrectly states that the proposals can have no effects on SACs. Malahide SAC will be directly overflown by the plans to operate a divergent route for Easterly departures on the North Runway in mixed-mode operation. This divergent route has no planning permission and was never proposed in the original planning in 2004-2007 under Option 7b.

As can be seen this Easterly departure route on the North Runway has a 15 degree divergnce path and takes a route over Robswall Park in Malahide and over the Malahide SAC.



It is a failure of the screening process to even acknowledge this potential to affect a SAC and as a minimum, appropriate assessment is warranted.

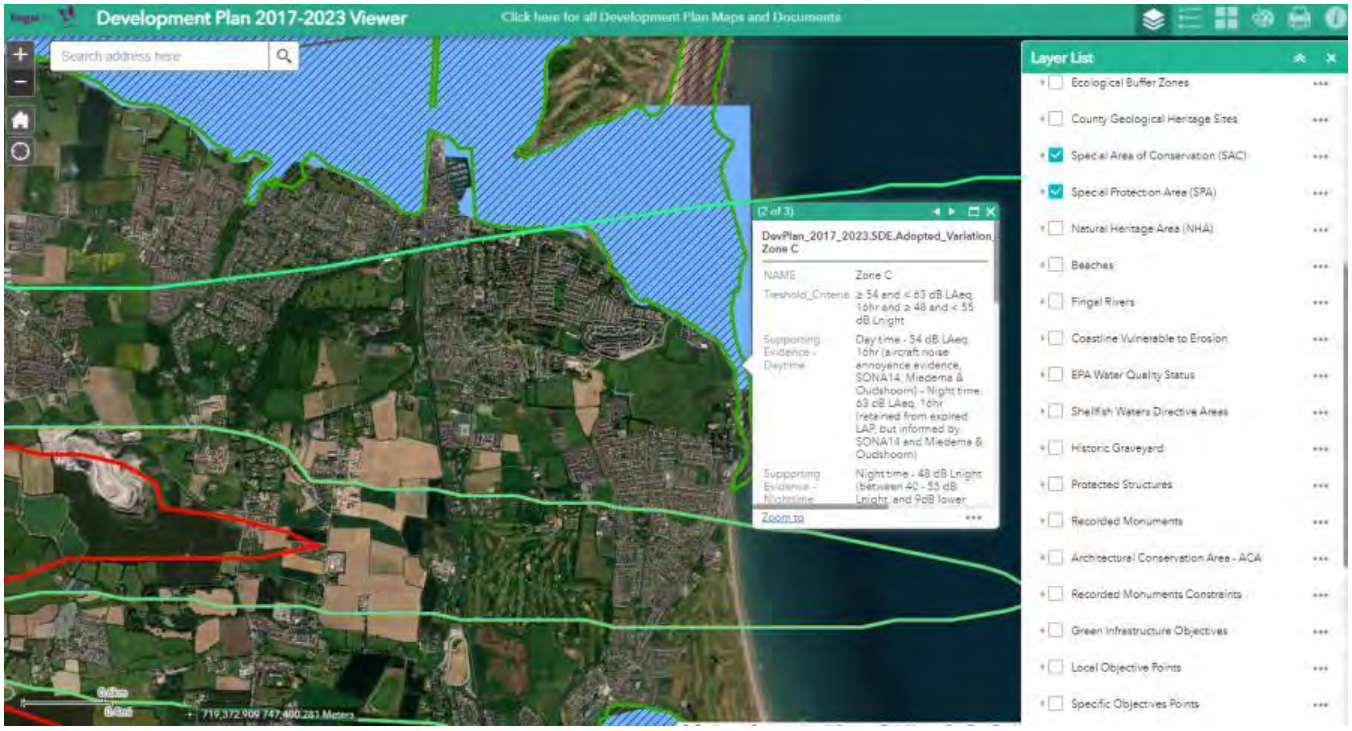
In fact, this screening report states in section 2.1.7 that:

"Flight paths will not pass over Malahide Estuary SPA, North Bull Island SPA or Howth Head Coast SPA, which are otherwise within 15km of Dublin Airport".

It is also very noticeable that the Lnight contours for 2025 Proposed do not appear to take departures on the North Runway into account as the noise contours don't stretch over this flight path.

Questions need to be raised why this is the case. This contradicts with the Fingal Development Plan, Variation #1, where 100% directional routes were modelled up to 2037. The Development Plan has this area around Robswall Park/Low Rock Malahide in Zone C, which caters for daytime noise levels >= 54 dB and < 63 dB LAeq16 and including night-time noise levels >= 48 dB and < 55 dB Lnight.

Fingal County Council and ANCA need to scrutinize the DAA to see if they have neglected to model departures on the North Runway for easterly departures.



In addition, easterly departures on the South Runway do not fly directly over Howth Head Coast SPA but are in very close proximity to it. This can be perceived as a current flight path, but as a minimum it should be assessed in this screening report.

There's also failure of the screening process to take the proposed night-time operations into account. The planning application is proposing to allow night-time flights on the North Runway between 23:00-24:00 and 06:00-07:00. No mention of screening for effects on the SACs and SPAs along the Irish coast potentially affected for these night-time operations.

Nor does the screening report examine the Noise Quota Count system and scrutinize its potential for a larger number of night-time flights on both runways that will impact on SPAs and SACs on the Irish coast.

11.2 LITERATURE REVEIW

In the summary of the literature review, which itself is very sparse, it states that noises > 60 dB(A) have been shown to elicit disturbance responses in some studies".

Here is a map displaying forecast 2025 Proposed N60 contours, which shows the number of events > 60 dB at night and how there are forecast to be between 25-49 noise events impacting on SACs and SPAs.

Another important feature to be noted that could have a significant effect on wildlife and birds will be the difference between the Covid-19 quiet period and a return to growth in aircraft movements. This difference in activity needs to be analysed and assessed.

Table 11 in the Appropriate Assessment Screening Report compares the number of aircraft movements > 60 dB LAmax between Permitted and Proposed scenarios.

Comparing 2025 Permitted and 2025 Proposed, the number of noise events > 60 dB LAmax increases from 35 to 45 (28.6% increase) for Baldoyle Bay and increases from 31 to 45 (45.2% increase) for Ireland's Eye.

11.3 SACs

The screening report for Appropriate Assessment makes very little reference to SACs. In its conclusion it states that

"the nearest SAC to the North Runway is Malahide Estuary SAC, located approximately 4km north-east and designated for a number of coastal and estuarine habitats. The SAC is not designated for any Annex II species (or mobile species). Taking into consideration the distance of the SAC from the North Runway, there is no potential for the increased number of night-time flights to have any effect on the qualifying habitats. For these reasons, this AA screening was therefore concerned with testing for LSE on Special Protection Areas only".

Incredibly, the report makes no reference to the other SACs in close proximity to Dublin Airport. How were they screened out?

In relation to the Malahide Estuary SAC, its qualifying interests are:

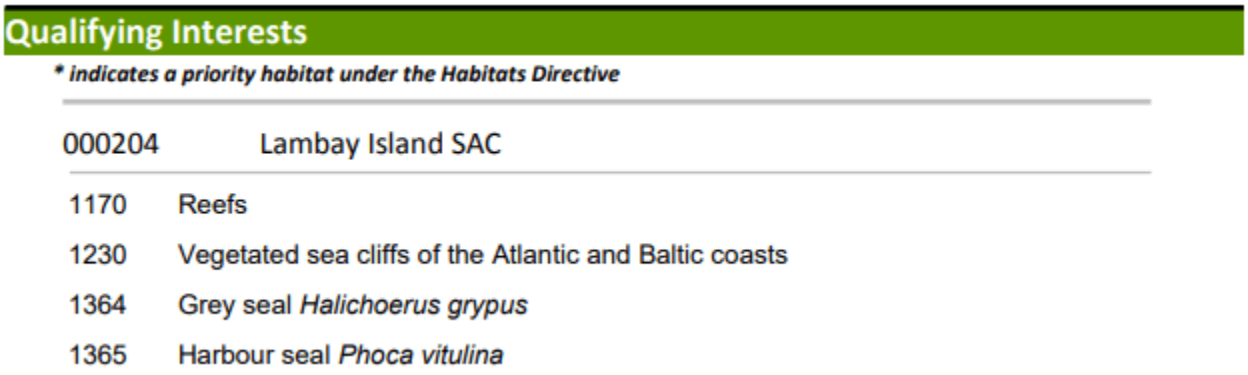
Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

000205	Malahide Estuary SAC
1140	Mudflats and sandflats not covered by seawater at low tide
1310	*Salicornia* and other annuals colonising mud and sand
1320	*Spartina* swards (Spartinion maritimae)
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
1410	Mediterranean salt meadows (Juncetalia maritimi)
2120	Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)*

All of the above are Annex I natural habitat types and should be listed and a screening decision made on each.

Lambay Island SAC contains both Annex I and Annex II species:



Qualifying Interests

** indicates a priority habitat under the Habitats Directive*

000204	Lambay Island SAC
1170	Reefs
1230	Vegetated sea cliffs of the Atlantic and Baltic coasts
1364	Grey seal *Halichoerus grypus*
1365	Harbour seal *Phoca vitulina*

The other SACs of interest:

- Rockabill to Dalkey Island SAC
- Baldoyle Bay SAC
- Howth Head SAC
- North Dublin Bay SAC
- Ireland's Eye SAC
- Rogerstown Estuary SAC
- South Dublin Bay SAC

As these SACs are not even mentioned, it is evident that that a thorough identification of the European Sites within the Zone Of Interest has not been carried out. All SACs in general have been screened out on the assumption that the proposed Relevant Action does not have any effect on SACs, as it "*does not propose any changes to the consented and under-construction layout of infrastructure associated with Dublin Airport North Runway nor does it propose any additional infrastructure at the airport*". No further evidence is provided.

It is worth noting that this lack of consideration of SACs contrasts with the screening report provided by Fingal County Council for Variation No.1 of the Fingal Development Plan 2017-2023. This variation was primarily focused on the development of new Noise Zones for Dublin Airport and so a comparison with this proposed Relevant Action is very appropriate. Comparing the two screening reports, it is evident that the Relevant Action screening report is deficient and not fit for purpose.

11.4 AA NATURA IMPACT STATEMENT

In section 3.26 of ANCA's Final AA Natura Impact Statement, it considers that only continuous noise is relevant for bird disturbance as aircraft noise is regular and consistent. This cannot be said of night-time noise and the new airport layout when the North Runway becomes operational. The design of the airspace includes more routes and the number of flights during many of the night-time hours are less than 10. From Table 13B-12 of Appendix 13B, there are just 20 movements between 01:00 and 05:00 or one flight every 12minutes. During 02:00 to 04:00 there are only 3 flights forecast. These rates are not continuous and therefore intermittent noise needs to be assessed also

In section 3.27, it states that aircraft produce sound less than 65dB LAmax below 3000ft when descending. This is contradicted by measurements at the noise monitoring sites around Dublin Airport. In fact, arrivals achieve higher LAmax values at the monitoring sites than departures.

At a Community Liaison Group (CLG) meeting in April 2017 (https://www.dublinairport.com/docs/default-source/meeting-documentation/aircraft-noise-monitoring-datac4fa448b73386836b47fff0000600727.pdf?sfvrsn=8f6e160f_2), a presentation from BAP was given titled 'Aircraft Noise Monitoring Data from Noise Monitoring Terminals (NMTs)'. On slide 15 BAP show a comparison between arrivals and departures for NMT 1 between January to June 2016, and the results show that arrivals achieve on average 80dB LAmax compared to 76dB LAmax for departures:

Bickerdike Allen Partners
Architecture Acoustics Technology

NFTMS Maximum Noise Levels

January to June 2016 - Arrivals

NMT	Monthly Average* Maximum Noise Level, L_{max} dB					
	January	February	March	April	May	June
1	80	80	80	80	80	79

January to June 2016 - Departures

NMT	Monthly Average* Maximum Noise Level, L_{max} dB					
	January	February	March	April	May	June
1	76	76	76	76	76	76

The EIAR Appendices include Easterly N60 contours which are of interest of SPAs and SACs:

The additional information report (Appendix J RFI 118) also contains LAmax contours for specific aircraft and of interest are the contours for departures from Runway 10L in the Easterly direction:

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LEGEND:

Noise Contours
70 and 80 dB(A) L_{Amax}:

Current Procedure
NADP1
NADP2

Rev	Date	Description	Initials

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Dublin Airport
NADP Assessment

L_{Amax} Noise Contours
Departure Runway 10L
Airbus A330-300

DRAWN: MP CHECKED: DR

DATE: January 2019 SCALE: 1:100000@A4

FIGURE No:

A11219/R02/DR020

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LEGEND:

Noise Contours
70 and 80 dB(A) L_{Amax}:

Current Procedure
NADP1
NADP2

Rev	Date	Description	Initials

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Dublin Airport
NADP Assessment

L_{Amax} Noise Contours
Departure Runway 10L
Boeing 737-800

DRAWN: MP CHECKED: DR

DATE: January 2019 SCALE: 1:100000@A4

FIGURE No:

A11219/R02/DR021

In relation to section 5.6, the daa's 2025 figures show an additional 20 flights between 06:00-07:00, but 18 less flights between 07:00-08:00, a difference of just 2 flights in the 06:00-08:00

timeframe. This is shifting the burden of noise an hour earlier and this needs to be accounted for.

Section 5.18 states that more efficient aircraft will produce less noise. However, as shown in this submission the LAmax figures comparing the more modern B38M aircraft with the older B737 show less than 1dB difference in 2019 at NMT 1 for arriving aircraft and a difference of 1.55dB for departing aircraft. These differences are imperceptible levels. In the Dublin Airport Noise Action Plan (https://www.fingal.ie/sites/default/files/2019-04/NAP%20Final.pdf) it references the change in aircraft types from 2003 to 2017. In 2003 46% of aircraft were quieter aircraft (Chapter 4 and 14), 83% in 2008 and 90% in 2017. Yet noise exposure levels grew exponentially in line with movement increases.

> In 2017 over 90% of aircraft using Dublin Airport were the quietest types (Chapter 4 and 14) compared to 83% in 2008 and 46% in 2003[5].

From the statement made in section 5.22. it is worth considering the noise monitor at the coast road, NMT 20, close to Baldoyle SPA and SAC. Below is the LAmax distribution between July and December 2019 (https://www.dublinairport.com/docs/default-source/airport-noise/noise-monitoring-report-july---september-2019.pdf?sfvrsn=98b7f129_0). Over 60% of movements are greater than 72dB LAmax and over 10% greater than 75dB LAmax.

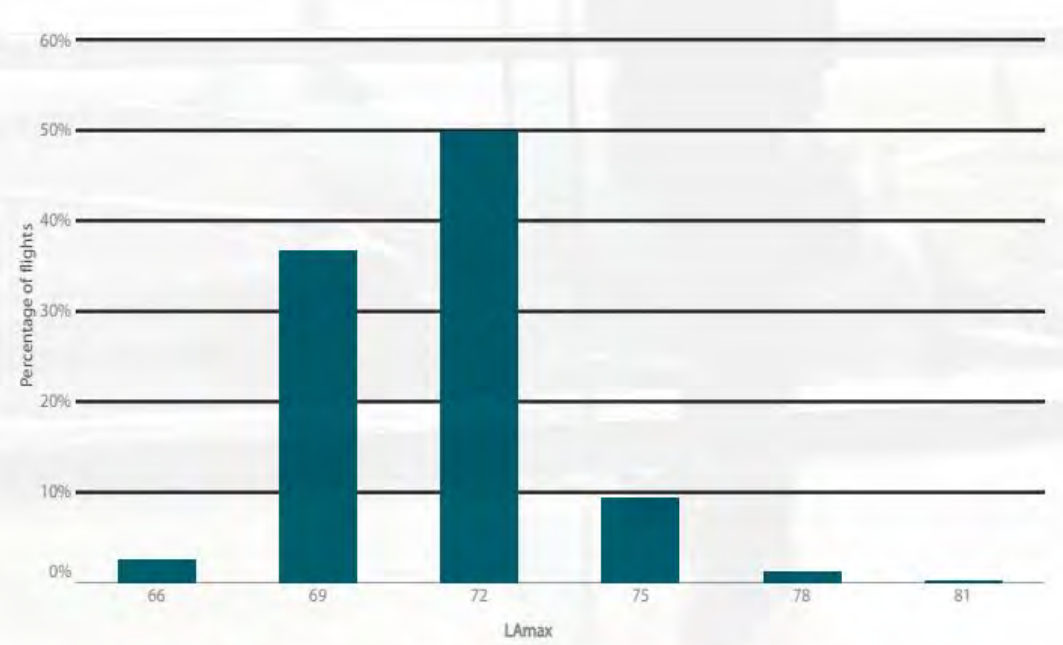


Figure 54: $L_{A,MAX}$ levels distribution for NMT 20, July – December 2019

In the EEA's 'European environment – state and outlook 2020' report, https://www.eea.europa.eu/publications/soer-2020/at_download/file, Box 11.3 refers to the effects of noise on wildlife. It refers to a study by Dominoni et al (2016) which showed that songbird species started their dawn song earlier due to aircraft noise compared to the same species unaffected by aircraft noise. It was also suggested that noise greater than 78dB(A) can impair acoustic communication in birds. This has also been supported by Gil et al (2014) and Sierro et al (2017) who further suggest 'higher fitness costs in relation to daily energy expenditure'.

One of the most studied effects of anthropogenic noise on wildlife is its impact on the singing behaviour of birds (Gil and Brumm, 2013). A study in the forest near Tegel airport in the city of Berlin found that some songbird species started their dawn song earlier than the same species singing in a nearby forest that was less affected by aircraft noise (Dominoni et al., 2016). The authors of the study concluded that the birds in the vicinity of the airport started singing earlier in the morning to gain more time for uninterrupted singing before the aircraft noise set in. In addition, it was found that during the day, chaffinches avoided singing during aircraft take-off when the noise exceeded a certain threshold, 78 dB(A), further suggesting that airport noise can impair acoustic communication in birds. ■

In conclusion the AA Natura impact Statement hasn't fully assessed the expected noise levels at the SPAs and SACs. It has underestimated the noise levels compared with real noise results from the monitoring stations. It also hasn't factored in the new routes that will become operational when the North Runway becomes operational or those new routes that are subject to the daa's Relevant Action. The report also assumes that night-time is continuous which has shown not to be the case. One also has to factor in the normal low ambient noise levels at these Natura sites when no aircraft are flying overhead. The change in noise levels can be significant.

Another important factor that needs to be considered is the potential change in dawn chorus due to the shifting of aircraft movements from 07:00-08:00 to 06:00-07:00, and what impact the increase in noise levels has on the birds due to higher energy expenditure on louder singing.

The assessment carried out cannot be relied upon to rule out negative impacts on the Natura sites in proximity to Dublin Airport.

11.5 SUBMISSION TO ANCA FROM SABRINA JOYCE-KEMPER

Ms Joyce-Kemper makes the points that the Appropriate Assessment is insufficient and that ANCA did not come to an AA determination before making the draft decision. There is no AA for the North Runway development. The North Runway granted permission under planning application F04A/1755, appealed to ABP under PLo6F.217429 and planning extension under F04A/1755/E1. At no stage was AA carried out for the development. The judgment in the Friends of the Irish Environment V An Bord Pleanála 2018 No.734 J.R. and Court of Justice Judgment C 254/19 which found that an extension to a permission was a project as defined under the EIA Directive and that definition was applicable to the Habitats Directive. As no AA has ever been carried out all potential impacts from the development since 2006 and any cumulative impacts with other developments granted since then must be assessed in order for a legal and valid appropriate assessment to be completed both by ANCA and by Fingal County Council. The current ANCA process and planning application could be deemed unauthorised development and that Fingal County Council and ANCA are precluded from considering a development consent that amends a previous consent that would have required an AA before it commenced.

This question on the lack of AA for the North Runway development was not addressed comprehensively in the Consultation Report.

Also included in this submission are the submissions from Ms Joyce-Kemper to the Planning Authority:

- SabrinaJoyceKemper.pdf
- 00718132.pdf

12.0 INSULATION SCHEME

12.1 SUMMARY

- Insulation installed in houses already insulated by the daa fails to mitigate against adverse noise levels as outlined in the report from the MLM Group.
- Insulation Scheme proposed by ANCA **insulates less houses** than in the planning application by the daa. A large number of houses in Coolquay, The Ward, St Margarets and Kileek Lane have been removed.
- In their draft decision, ANCA did not use the criteria 2 specification from the daa in their cost-effectiveness analysis. They only used criteria 1. The daa included all dwellings >55dB Lnight in 2025 for criteria 1 and all dwellings >50dB Lnight with a 9dB increase in 2022 Proposed compared with 2025 Permitted for criteria 2.
- Insulation Scheme only applies to the cohort deemed 'very significantly' affected. No mitigation for 'moderately' or 'significantly' affected dwellings.
- ANCA and the daa are proposing noise insulation as a mitigation measure to night-time noise increases within the St Margarets The Ward communities. This is contrary to Fingal County Council's advice within their own Development Plan, and testing carried out within the St Margarets The Ward area on housing that has already been insulated by the daa recently indicates the guidance referred to by Fingal County Council and the WHO cannot be achieved and will cause serious health issues of those affected by the proposed increase in night time noise.
- ProPG and WHO NNG Guidelines state an internal noise level of no more than 10-15 events > 45dB LAmax.
    - Based on N60 contours, 18,959 dwellings >= 10 events and 5,282 dwellings >=25 events for 2025 Proposed scenario. Mitigation for these dwellings is not taken into account. The cost-effectiveness analysis does not consider these large number of dwellings and so the application of the Balanced Approach is flawed.
- Conflicts with Fingal Development Plan as not all houses in Noise Zone B are being offered insulation,
- RFI #93 states that over-heating was not taken into account for insulation purposes. The response also does not take into account LAmax values as specified in the ProPG Guidelines and in BS8233:2014 section 7.7.2 note 4.
- No consultation with people potentially affected and requiring insulation.
- No medical expertise used in the analysis to determine the criteria for insulation.

- Large number of warehouses and offices in close proximity to Dublin Airport exposed to noise levels >60dB Lden and some exposed to levels >65dB Lden, potentially exceeding BS8233:2014 limits.
- Day time insulation scheme modelled with straight out routes and not with divergent routes. Dwellings excluded as a result and therefore subjected to harmful levels of noise. Scheme needs to be remodelled and North Runway operations suspended pending the remodelling.

12.2 DAA PROPOSAL

Land Use Planning. Residential Sound Insulation Grant Scheme.

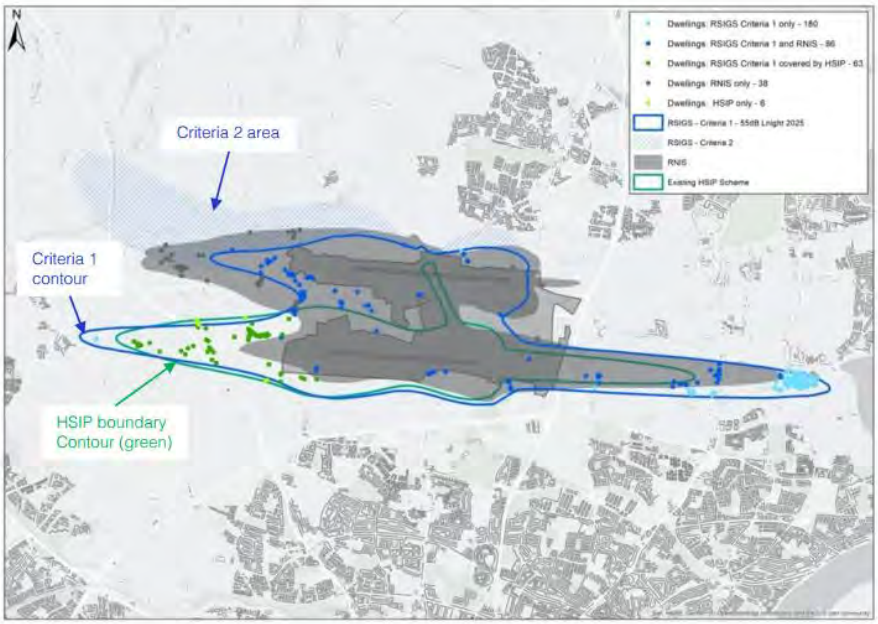
Minimising the potential for significant adverse effects arising from Scenario 2.

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.



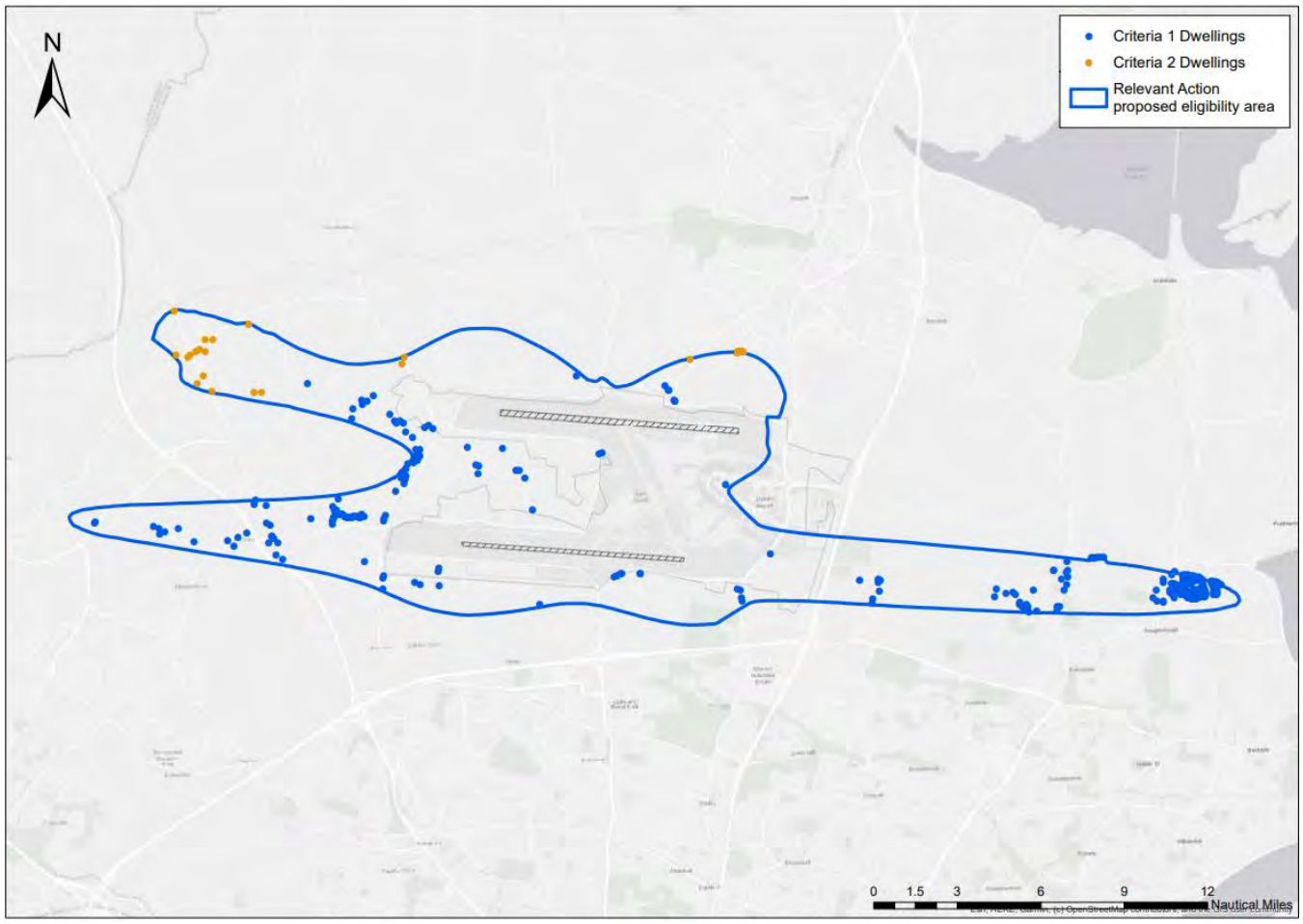
Dublin Airport Development of Proposed Noise Measures

For Criteria 1, there are 180 dwellings requiring insulation in the >55dB Lnight contour.

For Criteria 2, there are 54 dwellings requiring insulation based on >50dB Lnight and a +9dB change.

Arising from ANCA's draft decision the dwellings in Criteria 2 have changed. This is due to ANCA selecting 2025 as the reference year as opposed to 2022 used by the daa. As a result, the number of houses requiring insulation drops to circa 30 houses. The daa were intending to insulate 54 dwellings under criteria 2 but ANCA have reduced this to ~30.

12.3 APPENDIX L DRAFT REGULATORY DECISION



The choice of 2025 by ANCA for criteria 2 of the insulation scheme is a strange decision by ANCA. The intent of 'significance' with reference to an EIAR is to show the change before the development relevant to the change after development. It makes no sense to compare 2025 Proposed to 2025 Permitted. The residents will not be exposed to 2025 Permitted. That is a theoretical scenario. The significance should be related to when the development comes into operation. So, a comparison between real exposure levels to what is predicted when the development comes into force. Real exposure levels could be 2016, 2017, 2018, 2019, 2020 and 2021. It is assumed the North Runway will begin operations in 2022.

ANCA have chosen a baseline reference year of 2019 for their NAO yet have chosen 2025 Permitted as the comparison year.

2019 should not be used as the baseline reference year as highlighted in the accompanying documentation. 2016 is a more applicable year and the year used in the last Round of the END. And 2017 has been selected in the EU Commission's Action Plan 2021 "Towards zero pollution for air, water and soil".

The significance criteria should be the comparison of noise levels just before the North Runway opens and the anticipated noise levels for the first year after it opens. Because of the downturn in the aviation sector due to Covid, the current noise levels are well below what is to be expected for the population soon to be affected by the North Runway operations. The population affected are going to experience a significant increase in noise. Some of these residents may have experienced higher noise levels in 2018 and 2019 but have enjoyed a relative noise free environment for much of 2020 and 2021. Their noise exposure may increase in 2022 before the North Runway opens, but not to the levels of 2018 or 2019. They will experience a 'very significant' change in exposure when the North Runway opens and it's this significance that is important to their health and why it's a cornerstone of an EIAR. The population significantly affected by the change in noise levels should not be excluded solely based on a downturn in aviation due to Covid. Their health will be impacted by the sudden change in significance, and they need to be protected from such exposure. Protection of the population exposed to sudden rises in significant noise levels should be a fundamental duty of a Noise Regulator under EU598/2014. The Regulator cannot be excused of their duties by quoting Covid-19. 2018 and 2019 were the anomaly years as Fingal County Council recklessly allowed noise to spiral out of control.

ANCA have erred on their selection of 2025 as it fails the significance test. Comparison to a theoretical year of 2025 Permitted is meaningless. The significance test should be a comparison of what the exposure levels are just before and just after the North Runway opens.

12.4 CONSULTATION REPORT REGULATORY DECISION

In the Regulatory Decision report, figure 3.1 shows the revised RSIGS from ANCA:

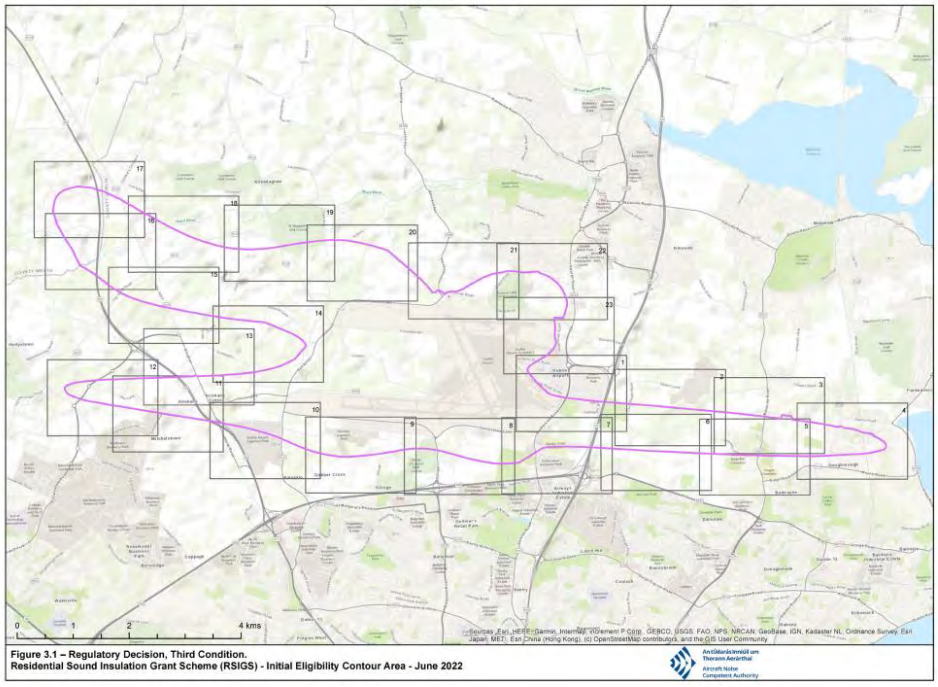
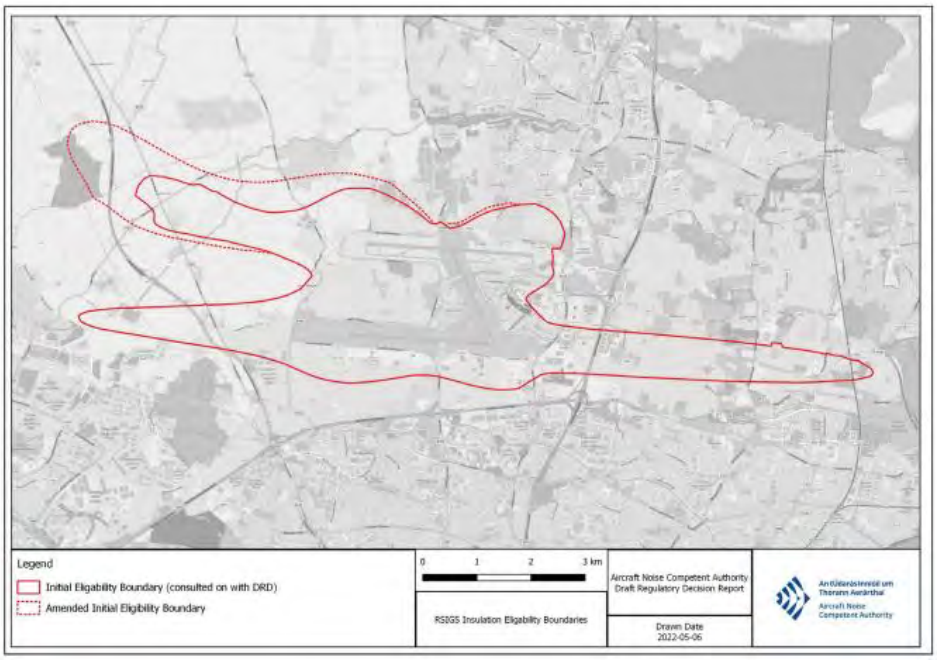


Figure 3.1 – Regulatory Decision, Third Condition.
Residential Sound Insulation Grant Scheme (RSIGS) - Initial Eligibility Contour Area - June 2022

In their Regulatory decision, ANCA have decided to extend the insulation scheme to reflect the 'very significant' determined from the 2022 forecast. Figure 14.1 of the Regulatory Report shows the difference in the RSIGS eligibility:



ANCA have changed criteria 2 to include dwellings exposed to a +9dB change in 2022 compared with 2019. This again falls short of what the daa proposed to insulate. The daa compared a +9dB change in 2022 with 2018 which allowed for more dwellings to be insulated.

ANCA are persisting with only insulating dwellings that are 'very significantly' affected by noise. This is against the advice of the HSE in their submission to ANCA. ANCA should be enforcing an insulation scheme for all dwellings 'significantly' affected by noise changes and not just 'very significantly' affected. Identifying 'Significance' is a key element of any EIAR and it is a threshold that should be reflected in any insulation scheme.

12.5 PRE-PLANNING

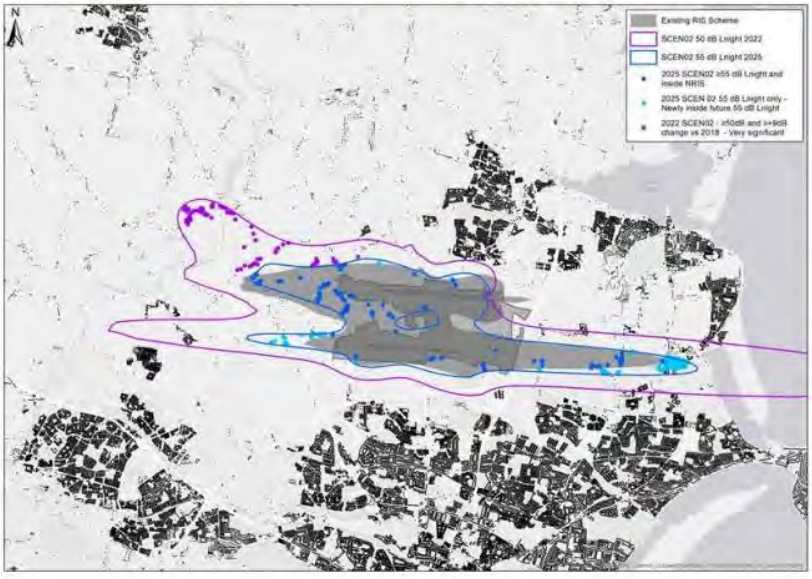
In a pre-planning presentation to Fingal County Council in November 2020, the daa presented details of their impending application. Included in the presentation are details of a new insulation scheme to take account of night-time noise.

- Grant scheme for sound insulation measures up to a value of €20,000 for dwellings:
  - Forecasted to be exposed to night-time noise levels of at least 55dB Lnight in **2025** or
  - Forecasted to be exposed to noise levels >50dB Lnight in **2022** arising from a change of at least 9 dB when compared with **2018**

The result was an intended 325 new dwellings to be insulated. For criteria 2, the daa were intending to insulate 83 dwellings >50dB Lnight in 2022 and have experienced a +9dB change relative to 2018. This is a far more appropriate comparison of when the North Runway opens compared to a real previous year.

Night Noise Insulation Grant Scheme

Based on exposure to noise levels >=55dB L_{night} 2025 or L_{night} >= 50dB (2022) and change >=+9dB
325 additional properties eligible noise insulation grant (over that currently covered by the NRIS).



	Dwellings
Total >=55dB Lnight 2025	360
Total >=50dB with +9dB change (2022 compared with 2018)	83
TOTAL DWELLINGS IN SCHEME	443
Dwellings already covered by existing NRIS	118
NEW DWELLINGS ELIGIBLE FOR NEW NIGHT NIS Grant	325

There are additional properties eligible under the current daytime scheme not included in these numbers = approx. 90 additional.

However, restricting to only those dwellings experiencing a +9dB change is a serious limitation of the scheme and not in line with EPA Guidelines on significance.

12.6 EIAR

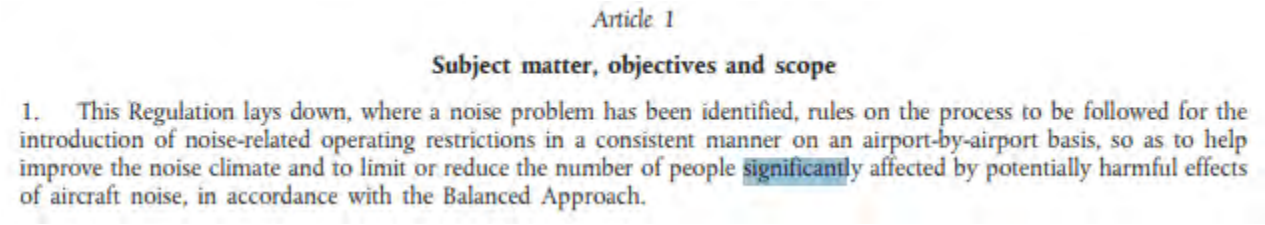
The daa's EIAR document presents table 13-3 to show the potential significance effect of absolute and relative changes in noise. Adding in the Lnight absolute and relative values shows the range of noise scenarios that cause significant effects.

Absolute Noise Level Rating Lnight	Change in Noise Level rating	0-0.9	1-1.9	2-2.9	3-5.9	6-8.9	>=9
< 40		Imperceptible	Imperceptible	Imperceptible	Not Significant	Slight	Moderate
40-44.9		Imperceptible	Imperceptible	Not Significant	Slight	Moderate	Significant
45-49.9		Imperceptible	Not Significant	Slight	Moderate	Significant	Significant
50-54.9		Not Significant	Slight	Moderate	Significant	Significant	Very Significant
55-59.9		Slight	Moderate	Significant	Significant	Very Significant	Profound
>=60		Moderate	Significant	Significant	Very Significant	Profound	Profund

Currently the daa are only proposing to insulate the dwellings shaded dark red (Very Significant and Profound effects). This is not acceptable and all dwellings in the light red shading (Significant effects) should be insulated.

For example, a dwelling in the 50-54.9 dB Lnight contour and which encountered a > 3 dB change should be insulated. Likewise, a dwelling in the 45-49.9 dB Lnight contour that experienced a > 6 dB increase in noise should also be insulated. And a dwelling in the 40-44.9 dB Lnight contour that experienced a noise increase >= 9 dB should also be insulated.

Article 1 of EU598/2014 states that the number of people 'significantly affected' by aircraft noise should be limited and reduced in accordance with the Balanced Approach. It does not state people 'very significantly' affected as proposed by the daa and ANCA.



Article 1

Subject matter, objectives and scope

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

In the UK Government's consultation document "Aviation 2050 The future of UK aviation" (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/769696/aviation-2050-print.pdf), it states that the Government is "*proposing new measures to improve noise insulation schemes for existing properties, particularly where noise exposure may increase in the short term or to mitigate against sleep disturbance*".

As a result, the Government proposes to extend the noise insulation beyond 63dB LAeq16 to 60dB LAeq16. Why haven't ANCA followed suit and what is ANCA's rationale for not doing so?

The Government also proposes to set a minimum threshold of 3dB LAeq for airspace changes leading to increased overflight which leave properties in the 54dB LAeq16 contour. So the UK Government acknowledges that a 3dB rise in noise levels warrants insulation.

3.121 The government is also:

- **proposing new measures to improve noise insulation schemes for existing properties, particularly where noise exposure may increase in the short term or to mitigate against sleep disturbance**

3.122 Such schemes, while imposing costs on the industry, are an important element in giving impacted communities a fair deal. The government therefore proposes the following noise insulation measures:

- **to extend the noise insulation policy threshold beyond the current 63dB LAeq 16hr contour to 60dB LAeq 16hr**
- **to require all airports to review the effectiveness of existing schemes. This should include how effective the insulation is and whether other factors (such as ventilation) need to be considered, and also whether levels of contributions are affecting take-up**
- **the government or ICCAN to issue new guidance to airports on best practice for noise insulation schemes, to improve consistency**
- **for airspace changes which lead to significantly increased overflight, to set a new minimum threshold of an increase of 3dB LAeq, which leaves a household in the 54dB LAeq 16hr contour or above as a new eligibility criterion for assistance with noise insulation**

Extending this to night-time movements, and following the 'significance' matrix above, all dwellings >50dB Lnight and experiencing a +3dB increase in noise should also be insulated. The criteria for changes in night-time noise requiring insulation should be:

- >40dB and +9dB
- >45dB and +6dB
- >50dB and +3dB
- >55dB

This is in agreement with the EPA EIAR Guidelines.

The Bap report titled 'Noise Information for the Regulation 598/2014 (Aircraft Noise Regulation) Assessment' (A11267_12_RP032_3.0) dated November 2020 lists the absolute noise impact criteria:

Table 1: Noise Impact Criteria (absolute) – residential

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

And in table 2 it lists the relative noise impact criteria:

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

In table 1, >55dB Lnight is ranked as 'High' and is used for the insulation scheme.

In table 2, 'High' includes changes in noise levels >6dB(A). Yet the daa only offered to insulate those dwellings exposed to 'Very High' (>9dB(A)).

ANCA failed to enforce enough health protection for populations exposed to 'High' relative levels of noise. The same 'High' criteria should be used in both circumstances.

Table 3 shows how the absolute and relative impacts are interpreted into magnitude of effect and is taken from the EPA Draft EIAR Guidelines:

Table 3: Summary of magnitude of effect – noise

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

BAP further state that '*A potential significant effect (adverse or beneficial) would be considered to arise if in Table 3 the magnitude of the effect was rated as significant or higher*'.

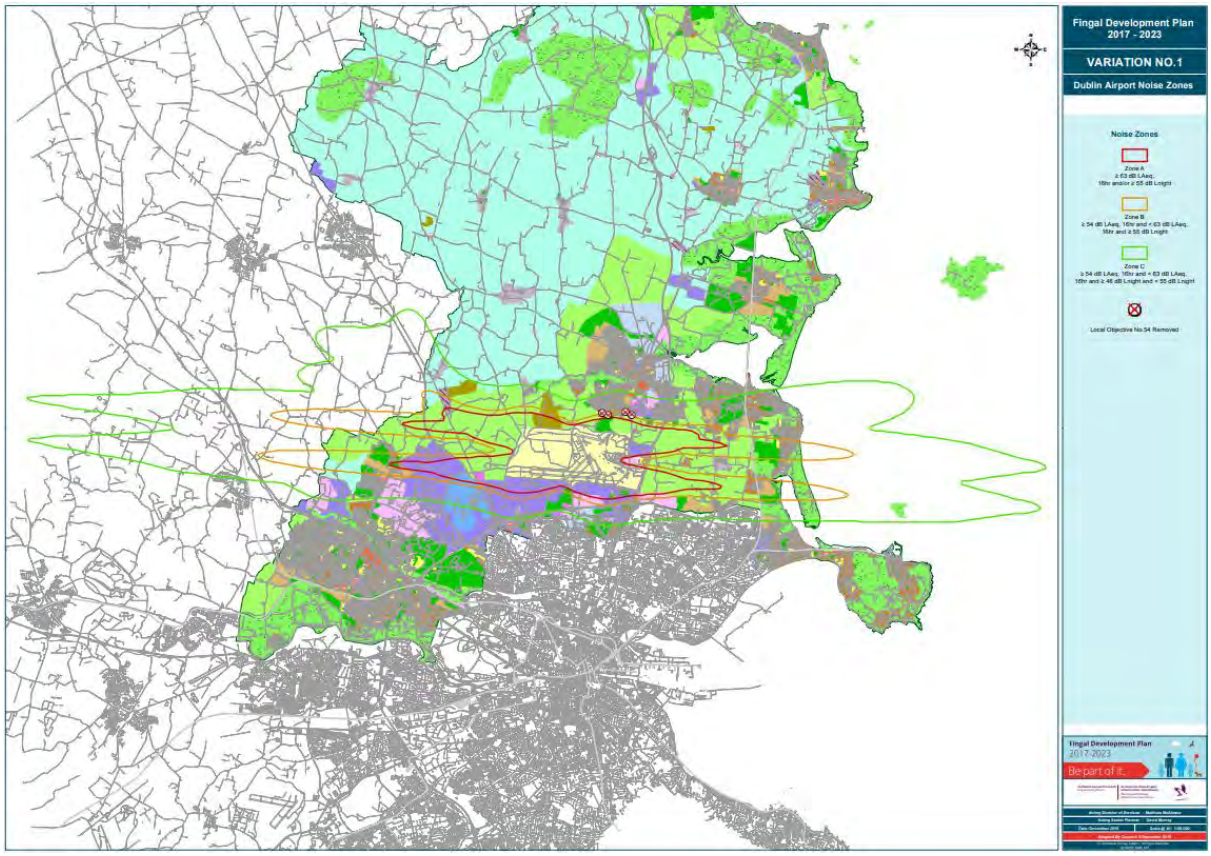
This is a very clear indication that the daa and ANCA have failed to mitigate against 'Significant' effects as defined by the EPA guidelines.

12.7 FINGAL DEVELOPMENT PLAN

Variation number 1 of Fingal Development Plan 2017-2023:

https://www.fingal.ie/sites/default/files/2020-01/map-adopted_variation_no_1.pdf

Zone B accounts for areas exposed to noise levels >55dB Lnight but ANCA are not intending to insulate dwellings within Zone B, conflicting with the Development Plan.



The Development Plan Zones take account of the fact that the areas in Zone B will experience noise >55dB Lnight during certain periods of the year. The requirement for anyone building in Zone B is that "*Appropriate well-designed noise insulation measures **must** be incorporated into the development in order to meet relevant internal noise guidelines*".

It is therefore very apparent that the noise insulation scheme proposed by ANCA conflicts with the Fingal Development Plan and many dwellings from Zone B will be omitted from the insulation scheme, thus not meeting the relevant internal noise guidelines.

It is also worth noting that the EIAR has no receptors around the Ward Cross or under the new North Runway flight path.

12.8 CONSULTATION REPORT – ADEQUACY OF NOISE INSULATION SCHEMES

With reference to the ANCA Public Consultation Report and with respect to their response to the "Adequacy of Noise Insulation Schemes" we would highlight some very gross misstatements and incorrect assertions as follows:

On page 36 it is stated that "*Noise Insulation Schemes are a common means of mitigating aircraft noise impacts*". This is a completely false statement when dealing with the Health Effects of Night-time noise and noise insulation does not mitigate this dangerous health issue. In order to further this argument on page 37 it is stated that "*Under the proposed scheme, where ventilators are provided, a ventilation strategy must be created for bedrooms in each eligible dwelling under the scheme, to be prepared in accordance with Part F of the Building Regulations. The aim of the Ventilator is to supply fresh air into bedrooms from the outside minimizing the requirement to open windows therefore maintaining the sound insulation performance.*"

We refer to the extracts below from the Building Regulations Technical Guidance Document Part F. The requirements for Purge Ventilation at section 1.2.4.6 is quite clear that it must be 1/20th of the floor area of the room and MUST be available at all times. Not as suggested by ANCA between noisy aircraft episodes to meet sound insulation requirements. With reference to Table 3 of The Technical Guidance Document the minimum General ventilation are the Ventilators ANCA are referring to and this by itself in no way meets the requirements of the Building Regulations. Also, in Summer when temperatures are high the Ventilators noted are of no assistance in cooling. The scenario ANCA portray are one similar to a jail cell where ventilation requirements complying to building Regulation requirements are being contravened to satisfy night-time flights. These are very serious misrepresentations of the real facts and must be addressed by An Bord Pleanala.

I.S. EN 13141-1:2004 and installed to manufacturers' instructions.

1.2.4.5 Manually controlled background ventilators may be used. Background ventilators that respond to pressure differential across the ventilator and automatically reduce opening area to adjust ventilation flowrate may also be used.

Purge Ventilation

Windows (habitable rooms)

1.2.4.6 For a hinged or pivot window that opens 30° or more, or for sliding sash windows, the height multiplied by the width of the opening part should be at least 1/20th of the floor area of the room.

For a hinged or pivot window that opens between 15° and 30°, the height multiplied by width of the opening part should be at least 1/10th of the floor area of the room.

If the room contains more than one openable window, the areas of all the opening parts may be added to achieve the required proportion of the floor area. The required proportion of the floor area is determined by the opening angle of the largest window in the room. Refer to Part B /TGD B of the Regulations for minimum opening sizes required for escape.

Where a risk of overheating is identified, a greater proportion of opening areas may be required: see TGD L 2019 paragraph 1.3.5.2 (d).

External doors (including patio doors) (habitable rooms)

For an external door, the height x width of the opening part should be at least 1/20th of the floor area of the room.

If the room contains more than one external door, the areas of all the opening parts may be added to achieve at least 1/20th of the floor area of the room.

If the room contains a combination of at least one external door and at least one openable window, the areas of all the opening parts may be added to achieve at least 1/20th of the floor area of the room.

Mechanical Extract Fans

1.2.4.7 Mechanical extract fans should be chosen to achieve the specified airflow rate having regard to location, length and type of ducting and size and type of discharge grille. Axial fans are normally only suitable for use with short length of through-the-wall ducting of the same size as the fan outlet. For bathrooms, axial fans may be acceptable for use with flexible ducting up to 1.5 m long and two 90° bends. Centrifugal fans can generally be used with flexible ducting of up to 3m and one 90° bend for extract rates of 60l/s (e.g. from kitchen) and up to 6m for extract rates of 15 l/s with two 90° bends (e.g. from bathrooms).

1.2.4.8 The appropriateness of a particular fan for a particular use should be verified by reference to manufacturer's data. The aerodynamic performance of extract fans should be established using the test methods specified in I.S. EN 13141-4:2011. For cooker hoods the test methods are specified in I.S. EN 13141-5:2004.

Room or Space	General Ventilation Minimum equivalent area of background ventilator[a] (mm^2)	Extract ventilation Extract fan[b] - Minimum intermittent extract rate (l/s)[h]	Purge ventilation Opening window or external door - Minimum provision[g]
Habitable Room	*7000[c,f]*	-	*1/20th of room floor area*
Kitchen	*3500[c,d,f]*	*60l/s generally 30l/s if immediately adjacent to cooker (e.g. cooker-hood not recirculating)*	*Window opening section (no size requirement)[d]*
Utility Room	*3500 [c,d]*	*30 l/s*	*Window opening section (no size requirement)[d]*
Bathroom	*3500 [c,d]*	*15 l/s*	*Window opening section (no size requirement)[d]*
Sanitary Accommodation (no bath or shower)	*3500 [c,d]*	*6 l/s[e]*	*Window opening section (no size requirement)[d]*

Notes:
(a) See paragraph 1.2.4.1 re: total equivalent area for all background ventilators.
(b) See paragraphs 1.2.4.9 and 1.2.4.10 re alternative of passive stack ventilation or continuous room ventilation with heat recovery.
(c) See paragraph 1.2.4.12 re the extent and location of background ventilation where there is only a single exposed façade and cross-ventilation is not possible.
(d) See paragraph 1.2.4.3 re ventilation provision where the provision of background ventilation and purge ventilation is not possible, e.g. when there is no external wall.
(e) As an alternative, the opening window section provided for purge ventilation may also be relied on for extract ventilation.
(f) See paragraphs 1.2.4.13 to 1.2.4.15 re: provision for ventilation of habitable rooms through other rooms or into courtyards.
(g) Opening window or external door minimum provisions given in this table are for ventilation purposes. Other requirements apply to the provision of openings for windows or external doors for example escape in case of a fire. Refer to Part B / TGD B for further guidance.
(h) The performance flowrates for intermittent extract fans should be tested in accordance with I.S. EN 13141-4:2011, Cooker Hood performance flowrates should be measured in accordance with I.S. EN 13141-3:2017.

12.9 DAY TIME INSULATION SCHEME - RNIS

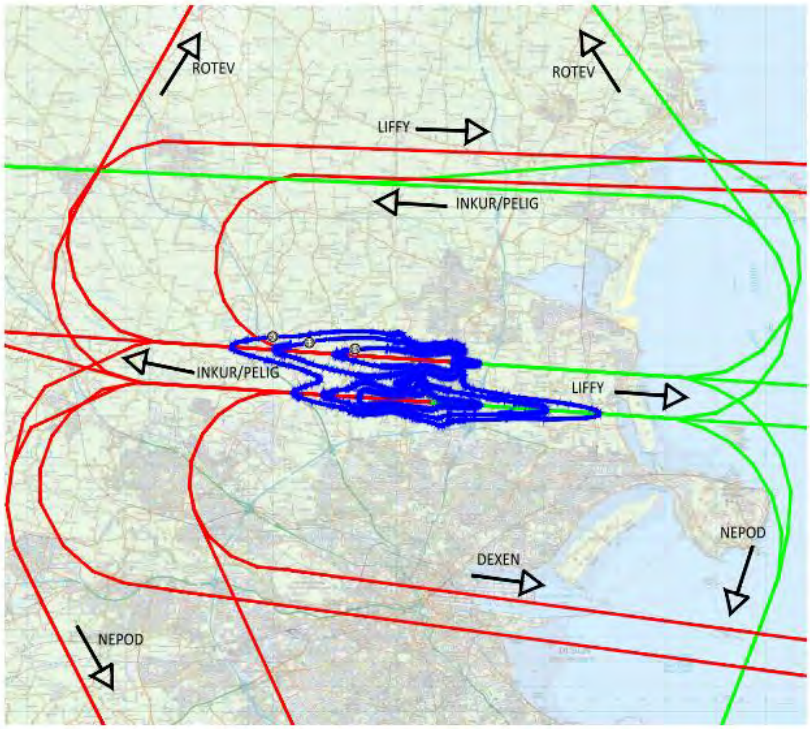
The Residential Noise Insulation Scheme is based on the 63dB LAeq16 contour.

In the insulation scheme report submitted to Fingal County Council for Condition 7 of the North Runway's Planning permission, BAP provide a report on the Option 7b contours for conditions 6, 7 and 9. In section 2.4 of this BAP report, it states:

"*For the parallel runways, **initial departure routes have been prepared based on the existing published routes for the south runway, with those for the north runway in effect replicating them**. There are four initial departure routes for each runway end, heading approximately north, south, east and west.*

*For category A & B aircraft, the initial turns are modelled as occurring shortly after the end of the runway. **For category C & D aircraft, the aircraft are modelled as flying straight for 5 nm before turning**. These C & D routes have been supplemented for departures to the west by routes that turn earlier. This assumption arises from a previous study of radar data which found that approximately 75% of the category C & D aircraft on runway 28 actually perform their initial turn earlier than described by the SIDs. **This is because they have reached an altitude of 3,000 ft or greater and are permitted to exit the environmental corridor at this altitude** if cleared by Air Traffic Control. Two additional 'Early Turn' routes per runway were therefore created for large aircraft, one with an initial turn to the north which subsequently headed east, to the LIFFY beacon, and one with an initial turn to the south which remained heading south, to the NEPOD beacon*".

The initial modelled departure routes are shown in Figure A9843-R03-Rev3-02 and the noise contours in Figure A9843-R03-Rev3-01:



LEGEND:

Noise Contours, 60, 63 and 69 dB $L_{Aeq,16h}$

Initial Departure Routes, Westerly

Initial Departure Routes, Easterly

REVISIONS

Bickerdike Allen Partners
Architecture Acoustics Technology

Dublin Airport
North Runway

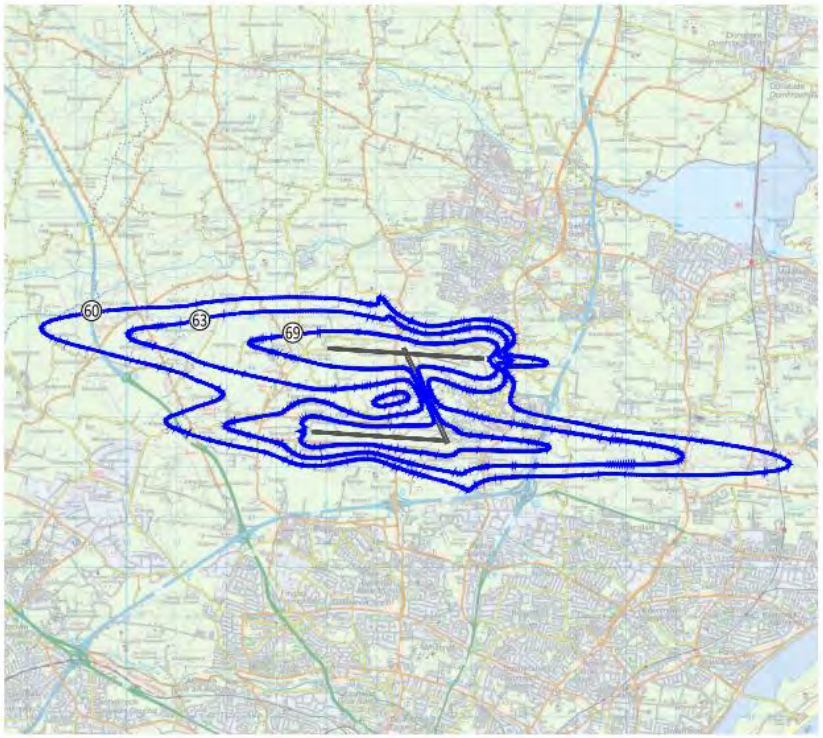
Airborne Aircraft Noise Contours
2022 HG Typical Busy Day Option 7B
and Initial Departure Routes

DRAWN: NW CHECKED: DC

DATE: October 2016 SCALE: 1:150000@A4

FIGURE No:

A9843-R03-Rev3-02



LEGEND:

Noise Contours, 60, 63 and 69 dB $L_{Aeq,16h}$

Modelled Runway Locations

REVISIONS

Bickerdike Allen Partners
Architecture Acoustics Technology

Dublin Airport
North Runway

Airborne Aircraft Noise Contours
2022 High Growth Typical Busy Day
Option 7B

DRAWN: NW CHECKED: DC

DATE: October 2016 SCALE: 1:75000@A4

FIGURE No:

A9843-R03-Rev3-01

As can be seen, these routes and contours are based on straight out operations mirroring the operation of the existing South Runway.

This is a serious flaw with the noise insulation scheme contours as no divergent routes were used. During the consultation process in 2016, the daa presented divergent routes for the public to choose from. Yet the insulation schemes were never modelled using these divergent routes. It is very clear to see that this is a serious issue with the insulation scheme and many homes affected by these divergent routes will not be covered by the scheme initially, therefore putting the health of the residents at risk.

This insulation scheme is not fit for purpose and does not model the intended routes to be used for the North Runway. The North Runway should not be allowed to open until this anomaly has been addressed.

13.0 NOISE MONITORING REPORTS

13.1 PROPG PLANNING GUIDELINES

The planning noise zones adopted by Fingal County Council in Variation number 1 of the Fingal Development Plan stipulate those applications for development in Zones A, B and C must carry out a noise assessment in accordance with the ProPG Planning Guidelines with respect to internal noise levels. The ProPG guidelines make use of LAmax as the key indicator for internal bedroom at night. Individual noise events should not exceed 45 dB LAmax more than 10 times a night. The guidelines also make reference to open windows and

"*where it is proposed that windows need to be closed to achieve the internal noise level guidelines, then full details of the proposed ventilation and thermal comfort arrangements must be provided*".

ACTIVITY	LOCATION	07:00 – 23:00 HRS	23:00 – 07:00 HRS
Resting	Living room	35 dB $L_{Aeq,16\,hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16\,hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16\,hr}$	30 dB $L_{Aeq,8\,hr}$ 45 dB $L_{Amax,F}$ (Note 4)

NOTE 1 The Table provides recommended internal L_{Aeq} target levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources. Ground-borne noise is assessed separately and is not included as part of these targets, as human response to ground-borne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.

NOTE 2 The internal L_{Aeq} target levels shown in the Table are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern, for example on a road serving a port with high levels of traffic at certain times of the night, an appropriate alternative period, e.g. 1 hour, may be used, but the level should be selected to ensure consistency with the internal L_{Aeq} target levels recommended in the Table.

NOTE 3 These internal L_{Aeq} target levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.

NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events (see Appendix A).

In Appendix A.10 the ProPG Guidelines make reference to the UK Government's Planning Practice Guidance and highlights the distinction between detectable impacts and adverse and significant adverse effects of noise on sleep.

- "Noise with the "potential for some reported sleep disturbance" is an "Observed Adverse Effect" that should be mitigated and reduced to a minimum; and
- Noise with the "potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep" is a "Significant Observed Adverse Effect" that should be avoided; and
- Noise that causes "regular sleep deprivation/awakening" is a "Significant Observed Adverse Effect" that should be prevented."

This focus on LAmax is also highlighted in the WHO Community Noise Guidelines 1999. It is therefore imperative that LAmax should be a critical assessment metric in the NAO.

The WHO Community Noise Guidelines 1999 are referenced in the BAP report titled "Dublin Airport Aircraft Noise Methodology Report" dated March 2020 and which was submitted to ANCA as part of their planning application to have the passenger numbers increased from 32m to 35m (F19A/0449).

In appendix A2.33 it states:

"*The 1999 WHO guidelines provide advice that for a good sleep**, indoor sound pressure levels should not exceed approximately 45 dB LAmax more than 10-15 times per night**. This guidance on internal noise levels remains current. Accounting for sleeping with a bedroom window slightly open (and a reduction from outside to inside of 15 dB), this translates to an outside sound pressure level of 60 dB LAmax*.".

The BAP report goes on further to explain how N60 contours can be used to show differences in scenarios for individual noise events:

"*N60 contours are therefore used in this assessment to illustrate how, for a given point on the ground, the number of aircraft events producing a level of 60 dB LAmax or more will change between various scenarios.*"

The WHO 2009 Night Noise Guidelines (NNG) makes reference to the Community Nosie Guidelines (1999):

"*If negative effects on sleep are to be avoided the equivalent sound pressure level should not exceed 30 dBA indoors for continuous noise. If the noise is not continuous, sleep disturbance correlates best with LAmax and effects have been observed at 45 dB or less. This is particularly true if the background level is low. Noise events exceeding 45 dBA should therefore be limited*

if possible. For sensitive people an even lower limit would be preferred. It should be noted that it should be possible to sleep with a bedroom window slightly open (a reduction from outside to inside of 15 dB). To prevent sleep disturbances, one should thus consider the equivalent sound pressure level and the number and level of sound events. Mitigation targeted to the first part of the night is believed to be effective for the ability to fall asleep."

The NNG comments further:

"*New information has made more precise assessment of exposure-effect relationship. The thresholds are now known to be lower than LAmax of 45 dB for a number of effects. The last three sentences still stand: there are good reasons for people to sleep with their windows open, and to prevent sleep disturbances one should consider the equivalent sound pressure level and the number of sound events. The present guidelines allow responsible authorities and stakeholders to do this. Viewed in this way, the night noise guidelines for Europe are complementary to the 1999 guidelines. This means that the recommendations on government policy framework on noise management elaborated in the 1999 guidelines should be considered valid and relevant for the Member States to achieve the guideline values of this document*."

The executive summary makes reference to the interim target (IT) of 55 dB Lnight,outside and for its recommendation in the situations where the NNG of 40 dB Lnight, outside is not achievable in the short term. But the "***IT is not a health-based limit by itself. Vulnerable groups cannot be protected at this level***".

The 2009 NNG makes reference to a comparison of 'Inside' to 'Outside'. The assumption is that the insulation value of a house is 30 dB with windows closed and 15 dB with windows open. With windows open 50% of the time then the value is 18 dB. The guidelines present a figure of 21 dB as a conversion factor between outside and inside and this takes account that even well insulated houses may have their windows open a large part of the year.

Another very important feature of night-time noise events is the difference between the background noise levels and these single events. Background noise levels are lower at night and therefore harder to mask the individual aircraft noise events. The environs of the flight paths to the West of Dublin Airport are rural, lending itself to quiet night-time ambient noise levels and therefore the changes from ambient to high aircraft noise levels is of high significance. This change from low background noise to high noise levels is seen with the report from the MLM Group included in this submission.

13.2 NOISE REPORTS

The DAA provide biannual noise monitoring reports and publish them on their website (https://www.dublinairport.com/corporate/sustainability-and-community/noise/airport-noise-noise-reports).

The January-June 2020 report shows a significant decrease in aircraft movements from March to June due to the Covid-19 pandemic. Table 4 provides overflying altitudes at the various noise monitoring terminals (NMTs) comparing with the same period in 2019:

Table 4: Average overflying height

	Height [ft]									
	NMT1		NMT2		NMT5		NMT6		NMT20	
	A	D	A	D	A	D	A	D	A	D
2019	900	2,600	1,100	2,600	1,100	2,800	1,200	2,800	1,500	3,400
2020	1,000	2,800	1,000	3,000	1,100	3,000	1,300	3,200	1,600	3,600

NMT1 monitors runway 28 departures and runway 10 arrivals. It's located at the 'Bay Lane' and is approximately 6.5km from the start of the runway.

Table 4 shows that arrivals were on average 100 ft higher at NMT1 and departures 200 ft higher. This can be explained by lighter load factors due to the loss of passengers during the Covid-19 pandemic.

The July-December 2019 report shows the average overflying height compared with the same period in 2018:

Table 4: Average overflying height

	Height [ft]													
	NMT1		NMT2		NMT3		NMT4		NMT5		NMT6		NMT20	
	A	D	A	D	A	D	A	D	A	D	A	D	A	D
2018	900	2,600	1,000	2,600	900	2,500	1,100	2,900	1,100	2,700	1,200	3,100	1,500	3,400
2019	1,000	2,500	1,000	2,600	1,000	2,500	1,100	2,800	1,100	2,700	1,200	3,100	1,500	3,400

And the January to June 2019 report compares the same period with 2018:

Table 4: Average overflying height

	Height [ft]									
	NMT1		NMT2		NMT5		NMT6		NMT20	
	A	D	A	D	A	D	A	D	A	D
2018	900	2,600	1,000	2,600	1,100	2,800	1,100	3,100	1,500	3,400
2019	900	2,600	1,000	2,600	1,100	2,800	1,200	2,800	1,500	3,400

Using these average overflying heights, the data shows that arrivals normally overfly NMT1 at 900ft and departures at 2600ft. The data in the first half of 2020 shows that these heights have increased but that can be explained by the lower loads due to lower passenger numbers. The report states that in the first half of 2020 there was a decrease of 65% in passenger numbers compared to the same period in 2019. And Runway 28 handled 88% of all the movements in this period.

The report provides the LAmax distribution for NMT1 in figure 12:

Figure 12 shows the $L_{A,MAX}$ distribution, for aircraft noise, for the first half year of 2020 for NMT 1.

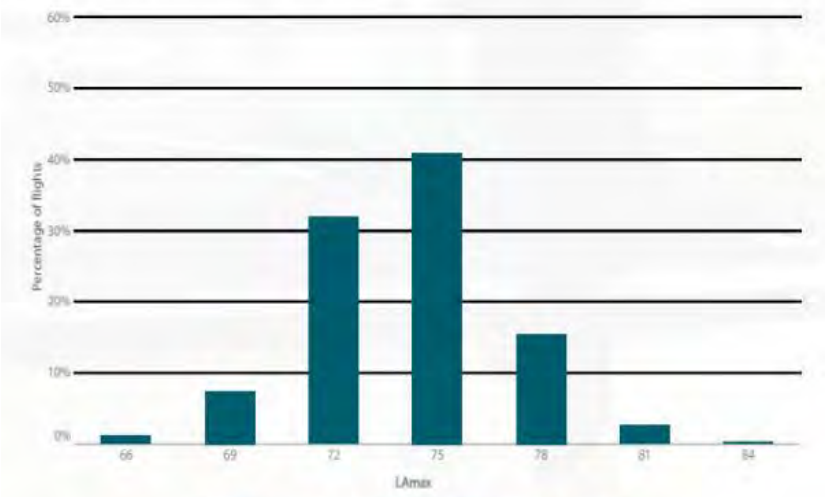


Figure 12: $L_{A,MAX}$ levels distribution for NMT 1, January - June 2020

Figure 12 shows that approximately 58% of aircraft movements detected at NMT1 had a LAmax value > 75 dB. Approximately 18% had a LAmax value > 78 dB and 2.5% > 81 dB.

Looking at the distribution of the LAmax values for the June-December 2019 time period, the percentage of events > 75 dB LAmax is approximately 68%. 26% are > 78 dB LAmax and 5% > 81 dB LAmax.

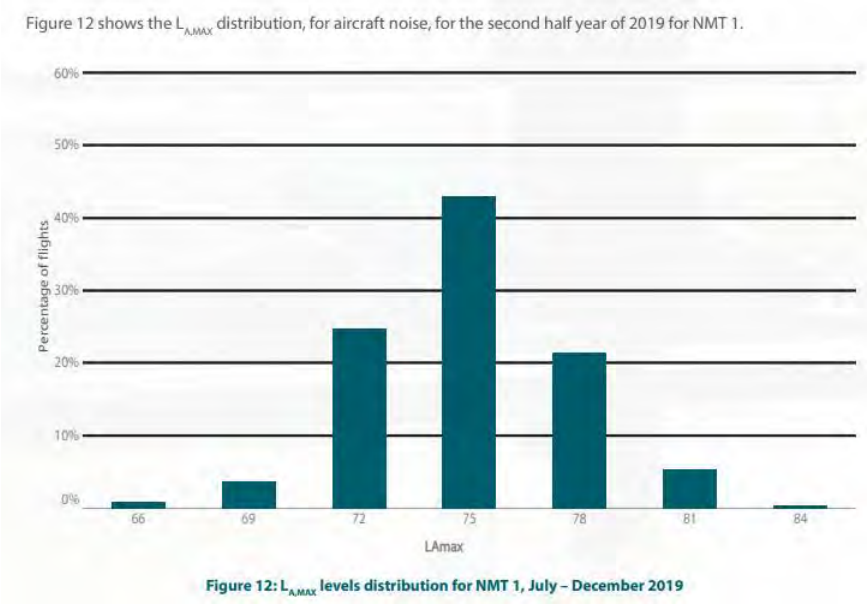


Figure 12: $L_{A,MAX}$ levels distribution for NMT 1, July – December 2019

The distribution for the first half of 2019 is similar. From these distributions and the lower heights of overflying aircraft one can deduce that the distribution for 2020 shows lower amount of LAmax events > 75 dB, which is below normal expected noise levels.

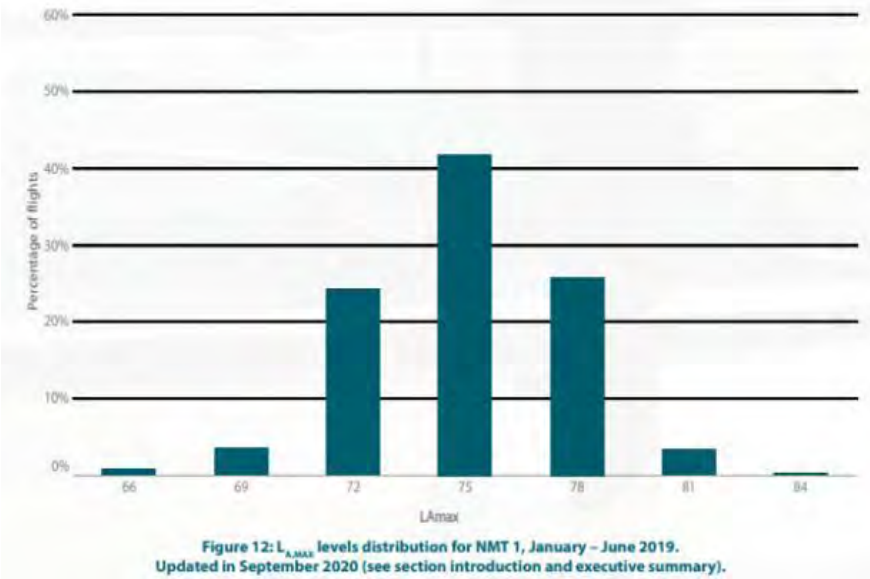
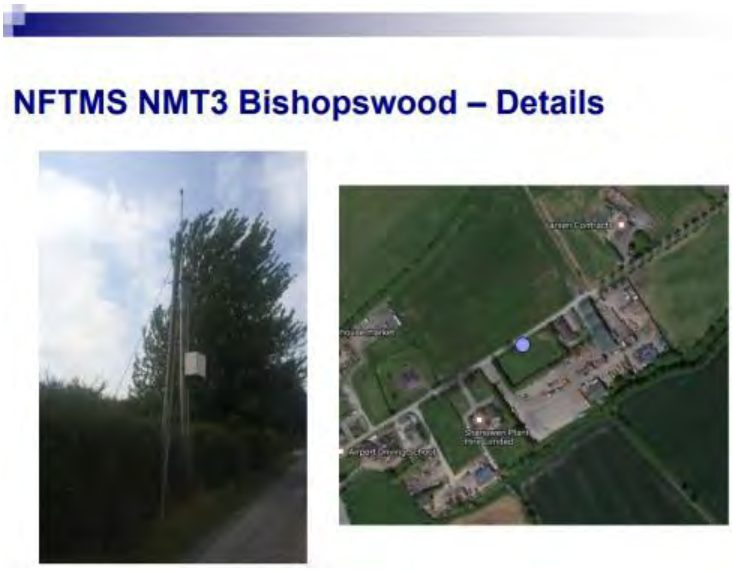


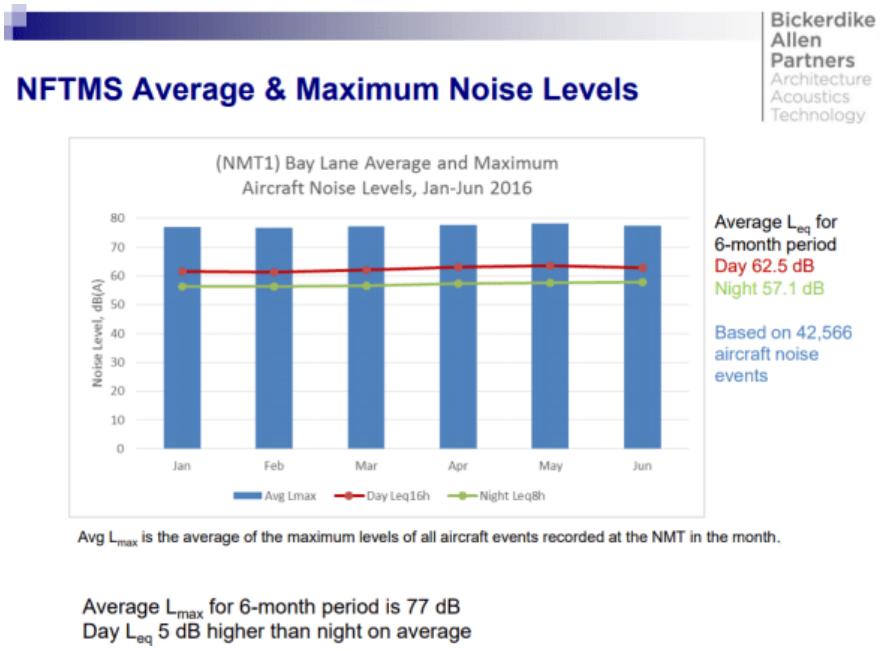
Figure 12: $L_{A,MAX}$ levels distribution for NMT 1, January – June 2019. Updated in September 2020 (see section introduction and executive summary).

13.3 BAP PRESENTATION

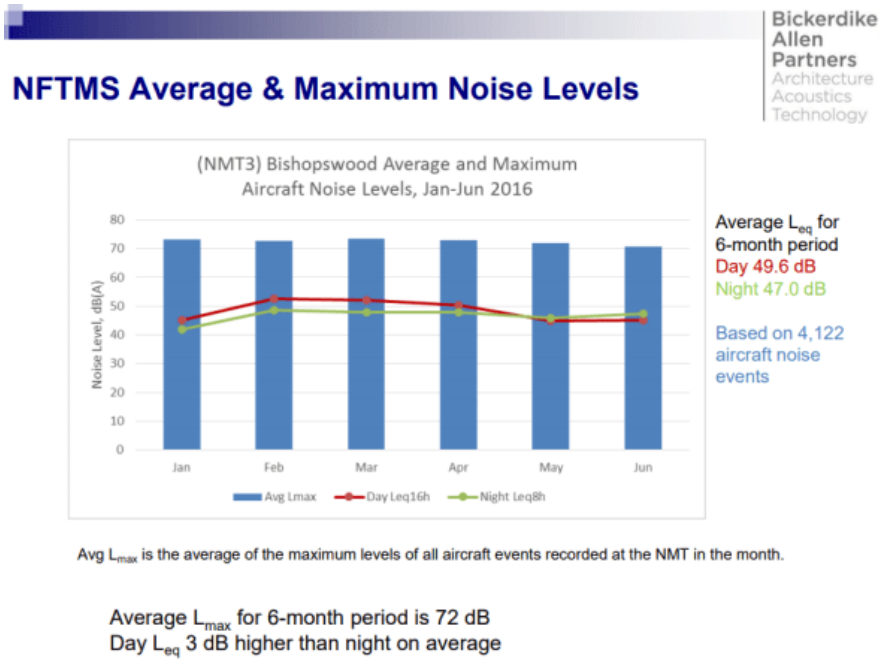
At a Community Liaison Group (CLG) meeting in April 2017 (https://www.dublinairport.com/docs/default-source/meeting-documentation/aircraft-noise-monitoring-datac4fa448b73386836b47fff0000600727.pdf?sfvrsn=8f6e160f_2), a presentation from BAP was given titled 'Aircraft Noise Monitoring Data from Noise Monitoring Terminals (NMTs)'. In this presentation BAP explain noise monitoring and metrics. The presentation also focused on NMT1 and NMT3 which are to the West of Dublin Airport.



Average LAmax at NMT1 from January-June 2016 was 77 dB:



Average LAmax at NMT3 from January-June 2016 was 72 dB:



An important point to note is that there are many dwellings that are located closer to Dublin Airport than NMT1 which is 6.5km from the start of the South Runway. These dwellings are exposed to noise levels in excess of those at NMT1 as the aircraft are lower on departure and arrival, closer to the airport.

LAmax values for 2019 were requested via an AIE request to the DAA on August 12th, 2020, and the DAA responded with an Excel sheet on September 9th.

Data for July and September for NMT1 was analysed and the following statistics produced:

- July
    - 1208 Noise events in the night-time period 23:00-07:00
    - Average of 39 movements per night at NMT1
    - Max value of 93.1 dB LAmax
    - Min value of 66.7 dB LAmax
    - Mean value of 76.1 dB LAmax
    - 6.7% of movements > 80 dB LAmax
    - 56.5% between 75-80 dB LAmax
    - 35.3% between 70-75 dB LAmax
    - 1.6% between 65-70 dB LAmax
- September

- 1101 Noise events in the night-time period 23:00-07:00
- Average of 37 movements per night at NMT1
- Max value of 106.7 dB LAmax
- Min value of 66.4 dB LAmax
- Mean value of 76.1 dB LAmax
- 12.2% of movements > 80 dB LAmax
- 52.0% between 75-80 dB LAmax
- 34.7% between 70-75 dB LAmax
- 1.2% between 65-70 dB LAmax

The data shows that during July and September 2019, over 37 movements per night were detected at NMT1 over the night-time period and over 63% of these movements were recorded at a value greater than **75 dB LAmax**, at a distance 6.5km from the start of the runway.

In the ProPG guidelines, appendix A2.33 states:

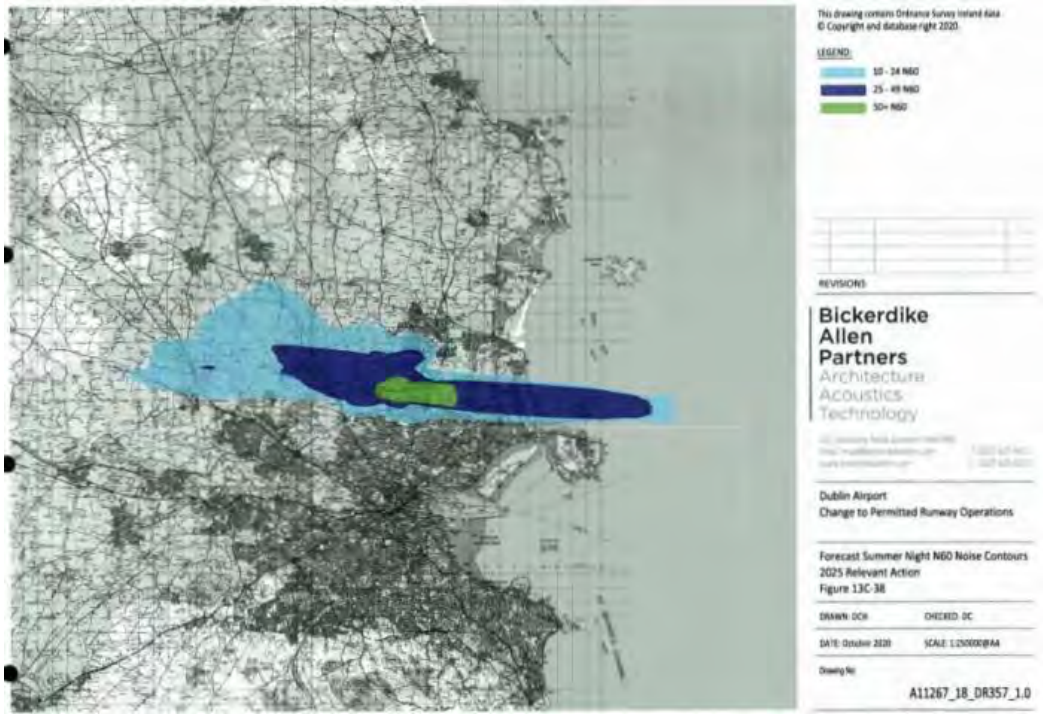
> "*The 1999 WHO guidelines provide advice that for a good sleep**, indoor sound pressure levels should not exceed approximately 45 dB LAmax more than 10-15 times per night**. This guidance on internal noise levels remains current. Accounting for sleeping with a bedroom window slightly open (and a reduction from outside to inside of 15 dB), this translates to an **outside sound pressure level of 60 dB LAmax***".

In table 13C-40 of the original EIAR's appendices, the existing population counts for the N60 metric are given for existing population count. N60 is the number of events above 60 dB LAmax per night-time period.

Table 13C-40: Existing Population Counts, N60 Metric

Metric Value N60	Scenario and Existing Population Count						
	2018 Baseline	2019 Baseline	2022 Baseline	2022 Relevant Action	2025 Baseline	2025 Consented	2025 Relevant Action
≥ 10	69,613	75,967	42,926	59,891	42,864	65,906	61,018
≥ 25	24,638	26,835	15,370	11,879	15,020	7,958	11,739
≥ 50	80	7,402	35	67	32	29	191
≥ 100	0	0	0	0	0	0	0

The '2025 Relevant Action' scenario has 42% more people (61018 vs 42864) subjected to between 10-25 noise events compared with '2025 Baseline'.



Based on the ProPG Guidelines, 61018 people will not be able to sleep with their windows slightly open or risk having their sleep disturbed, with the '2025 Relevant Action' Scenario.

Comparing with Table 13C-56 in the revised EIAR, the number of people exposed to > 10 events above 60dB LAmax with 2025 Proposed is 56,517. It is worth noting that the number of people exposed to > 25 such events increased from 11,739 with 2025 Relevant Action to 16,277 with 2025 Proposed, highlighting the significance increase in people experiencing adverse noise levels between the two EIARs, which as not been explained by the daa or challenged by ANCA.

Table 13C-56: Existing Population Counts, N60 Metric

Metric Value, N60	Scenario and Existing Population Count						
	2018	2022 Permitted	2022 Proposed	2025 Permitted	2025 Proposed	2035 Permitted	2035 Proposed
≥ 10	69,613	41,432	46,401	44,908	56,517	27,353	29,801
≥ 25	24,638	296	8,820	15,333	16,277	12,452	12,981
≥ 50	80	0	67	16	110	16	98
≥ 100	0	0	0	0	0	0	0

Analysing the later April – June 2021 noise report (https://www.dublinairport.com/docs/default-source/corporate/dublin-noise-report-2021-q2.pdf?sfvrsn=4dc7d803_0), the height of aircraft at noise monitors NMT1, 2, 3 and 4 decreased compared with the same period in 2020. A decrease in aircraft height results in higher noise levels.

From the charts below it is evident that arriving aircraft are noisier at the noise monitors than departures. This has been reported in this submission based on LAmax values obtained from the daa by the CLG group, 'NMT 1 2 3 2016 2018 2019 Lmax events.xlsx' in Appendix E. This highlights the inadequacy of the proposed Noise Quota Count System as it assigns a smaller count to most aircraft types to arrivals compared with departures. It therefore is illogical to use the proposed Night Quota Count System at Dublin Airport as it rewards noisier arrivals over departures for those populations living under the flight path and who are most affected by aircraft noise.

Average monthly LAmax noise levels per NMTs are shown in Figure 6

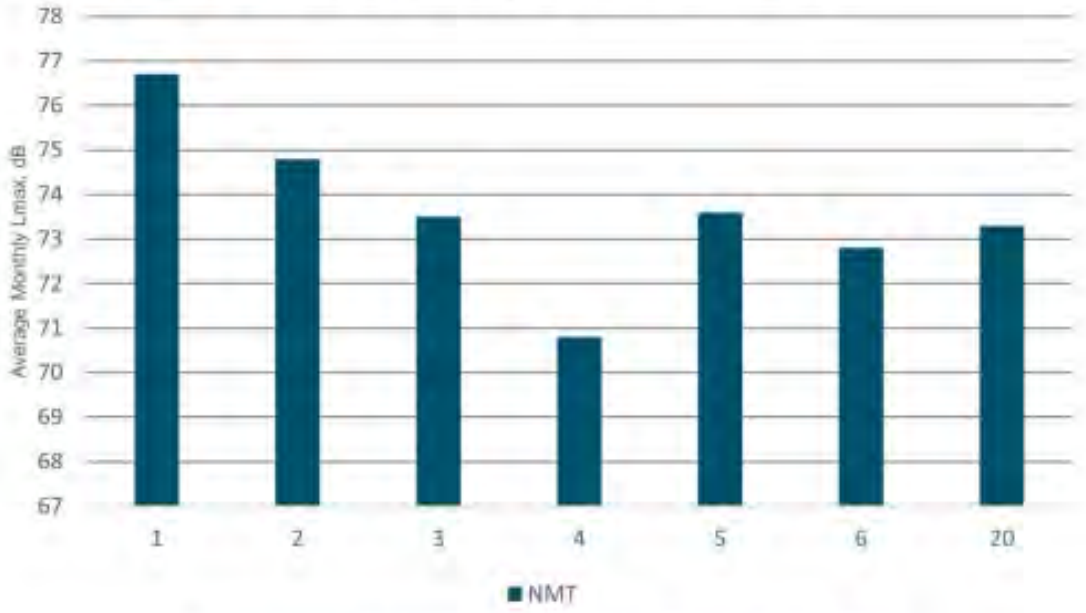


Figure 6: Average LAmax levels distribution for NMTs, April - June 2021

Average monthly LAmax noise levels per NMT for departing and arriving aircraft.

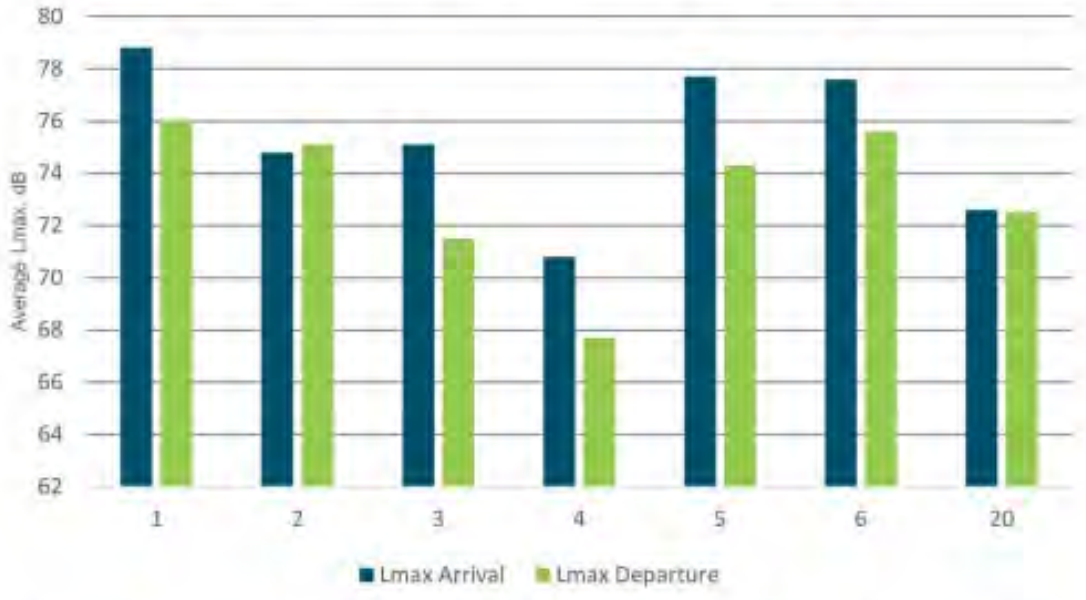


Figure 7: Average LAmax levels distribution for NMTs for arriving and departing aircraft, April - June 2021

From above the average LAmax at NMT1 for arrivals was 79dB and 76dB for departures

The LAmax distribution for April-June 2021 is given below.

Figure 23 shows the LAmax distribution for aircraft noise for the Second quarter of 2021 for NMT2.

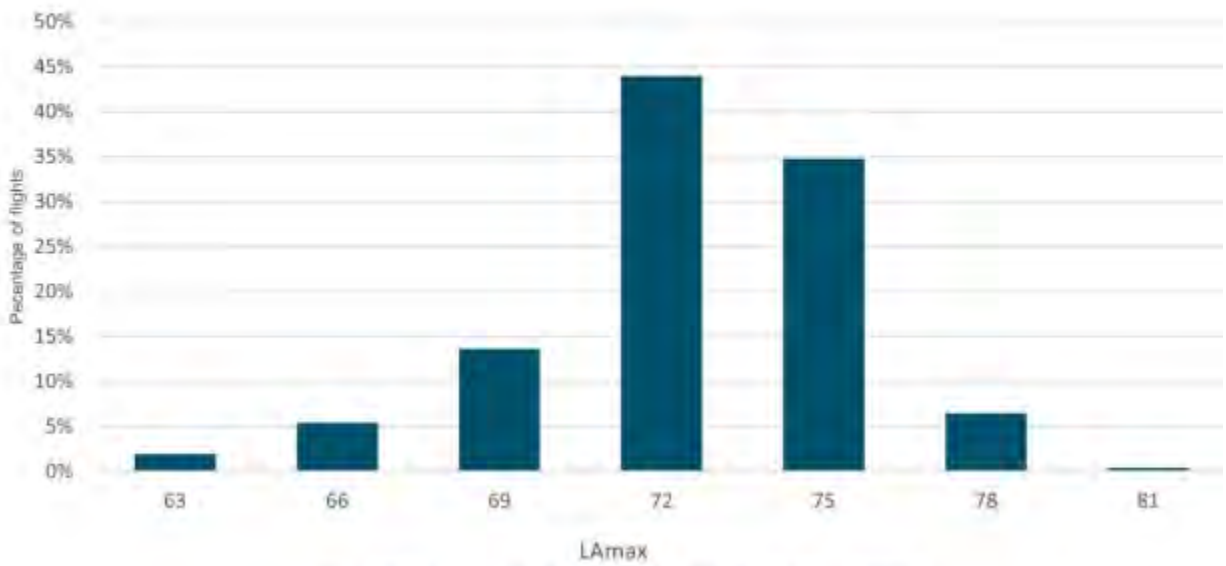
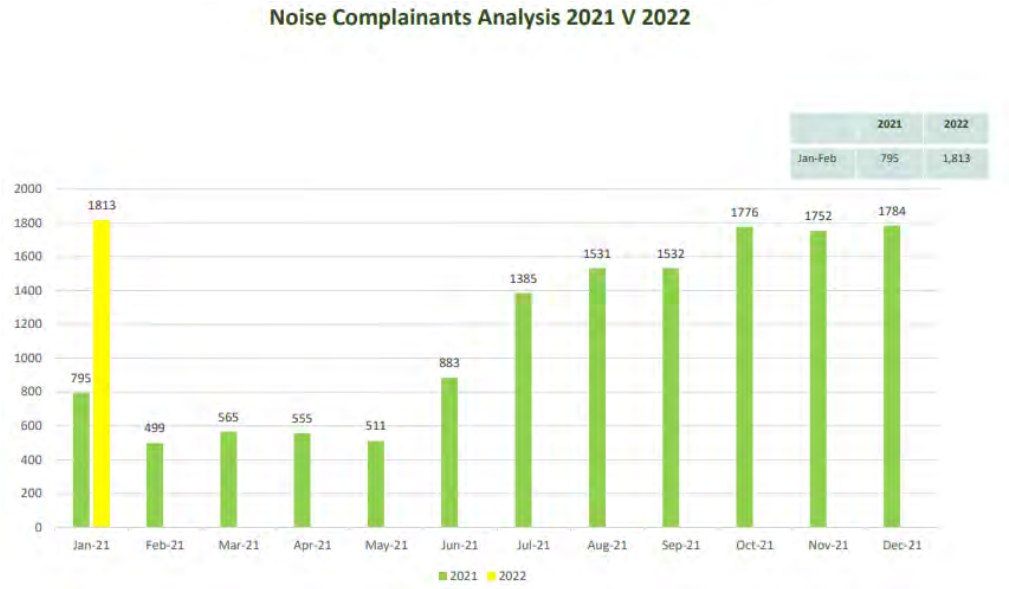


Figure 23: LAmax levels distribution for NMT 2, April - June 2021

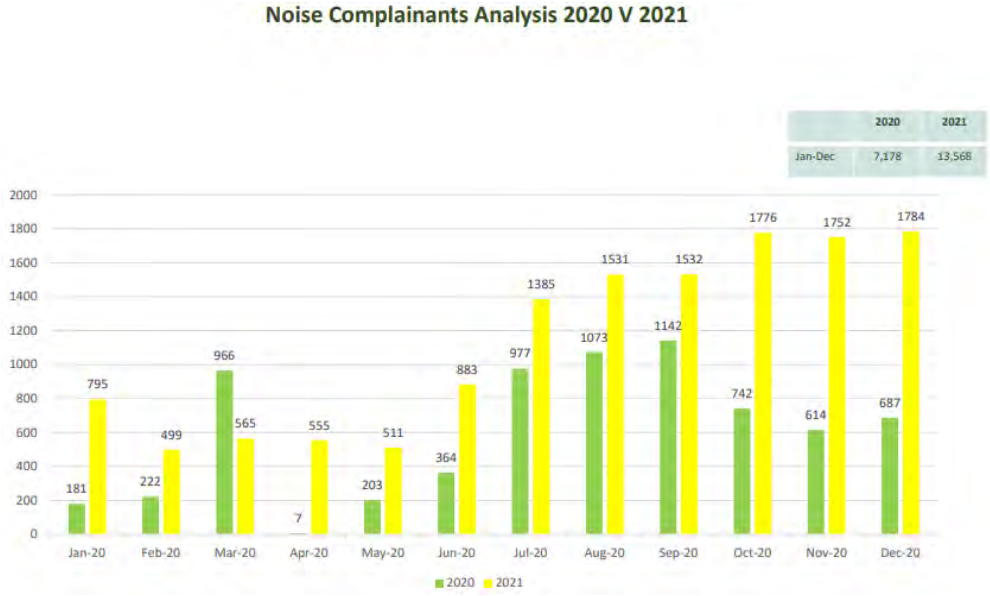
In ANCA's draft decision, they have not shown how they can protect the residents living closest to Dublin Airport when they are exposed to such high LAmax level exceeding the ProPG and WHO Guidelines. This is a serious omission from ANCA's analysis and highlights how they are failing in their duty to protect Public Health.

13.4 NOISE COMPLAINTS

The daa produce monthly Noise & Track Monitoring Reports. The latest report on their website is for January 2022 (https://www.dublinairport.com/docs/default-source/airport-noise/01-dublin-monthly-jan-2022.pdf). In January there were 1813 noise complaints. This is a significant increase on January 2021.



In the December 2021 report, it is clear to see the increase in noise complaints over the whole year.



There is no mention of noise complaints in ANCA's draft decision. How can the public have trust in the Noise Regulator if it fails to examine noise complaints? Why should the public complain if nothing is going to be done by the Regulator?

The Dublin Airport Noise Action Plan 2019-2023 identifies noise complaints as an action item:

8	Encourage daa to continue to operate noise complaint management systems and respond to all aviation-related noise complaints in a timely manner	Submission of progress report using target of 95% of aircraft noise complaints responded to within 28 days	Monitoring and community engagement through adequate response times to all aviation related noise complaints	Ongoing

The EPA in their 2020 Publication 'Ireland's Environment – An Integrated Assessment 2020' (https://www.epa.ie/publications/monitoring--assessment/assessment/state-of-the-environment/EPA_Irelands_Environment_2020.pdf) devoted a whole chapter to environmental noise. The report highlights the increasing number of noise complaints due to aircraft noise – 1453 in 2018.

Airport Noise: A Key Issue to Control When Passenger Numbers Increase Again

Dublin Airport welcomed 32.9 million passengers during 2019, setting a new record for traffic at the airport (Dublin Airport, 2020). Noise complaints around Dublin Airport have become a more significant issue in recent years, with the Dublin Airport Authority logging 1453 noise-related complaints in 2018 (Dublin Airport, 2019), although there has clearly been a major reduction in airport activities during the COVID-19 pandemic. The numbers of passengers using Cork (2.4 million passengers) and Shannon (1.85 million passengers) Airports had also increased in recent years, until the COVID-19 pandemic in 2020. However, both airports are currently below the threshold of 50,000 air movements per annum for noise mapping requirements. Over the last 3 years, according to the Dublin Airport Authority, there have been very few recorded noise complaints for Cork Airport and no noise complaints for Shannon Airport.

The report mentions the appointment of ANCA as Competent Authority. It states that the "*unit is responsible for ensuring that noise generated by aircraft activity at Dublin Airport is assessed in accordance with EU and Irish regulations*". Ignoring noise complaints and not taking on board public consultation is contrary to 2002/49/EC. Article 8(7) states that "*Member States shall ensure that the public is consulted about proposals for action plans, given early and effective opportunities to participate in the preparation and review of the action plans, that the results of that participation are taken into account and that the public is informed on the decisions taken. Reasonable time-frames shall be provided allowing sufficient time for each stage of public participation*".

In 2019, Fingal County Council was appointed as the competent authority to regulate airport noise at Dublin Airport under EU Regulation No. 598/2014 (Government of Ireland, 2019), which covers noise-related operating restrictions at EU airports with more than 50,000 aircraft movements per year. The independent competent authority section within Fingal County Council is called the Airport Noise Competent Authority. This unit is responsible for ensuring that noise generated by aircraft activity at Dublin Airport is assessed in accordance with EU and Irish regulations. It ensures the application of the 'balanced approach' to aircraft noise management, as set out by the International Civil Aviation Organization (ICAO), in cases where a noise problem or potential noise problem is identified at the airport (ANCA, 2019).

It is imperative that ANCA monitor noise complaints. This is the only mechanism that residents have to voice their annoyance with aircraft movements.

14.0 QUOTA COUNT SYSTEM

14.1 QUOTA COUNT SYSTEM

The use of the Quota Count System put forward by the daa halves the quota count value for B38M movements compared with B738 movements. The certification levels may be different but the noise on the ground is the same. Therefore, the quota count values should not be half/double. They should be comparable. The certification of aircraft is governed by EU598/2014 but the assignment of count values is not and can be designed on a case-by-case basis. It is very apparent that the UK approach of assigning quota count values is not appropriate to real noise levels on the ground in the environs of Dublin Airport.

Nmt #1	Num Arr	LAmax Arr	QC Arr	Num Dep	LAmax Dep	QC Dep
A320	4669	79.32	0.25	20075	74.65	0.5
A21N	125	78.50	0.25	496	73.81	0.5
A20N	157	77.57	0.125	630	72.93	0.25
B738	6959	79.61	0.5	30553	76.55	0.5
B38M	32	78.82	0.25	162	75.00	0.25

Nmt #2	Num Arr	LAmax Arr	QC Arr	Num Dep	LAmax Dep	QC Dep
A320	22702	75.59	0.25	5720	73.62	0.5
A21N	496	73.78	0.25	112	72.65	0.5
A20N	768	72.81	0.125	214	71.73	0.25
B738	34785	75.76	0.5	8686	75.74	0.5
B38M	152	73.98	0.25	17	74.96	0.25

Nmt #3	Num Arr	LAmax Arr	QC Arr	Num Dep	LAmax Dep	QC Dep
A320	183	72.24	0.25	2697	71.24	0.5
A21N	5	70.38	0.25	56	70.98	0.5
A20N	12	72.17	0.125	57	73.78	0.25
B738	194	72.36	0.5	14813	70.44	0.5
B38M	0		0.25	20	76.08	0.25

Nmt	LAmax Arr	LAmax Dep	LAmax Both
Nmt #1	78.94	75.90	76.52
Nmt #2	75.08	74.96	75.06
Nmt #3	72.30	71.13	71.16

Looking at the tables above it's clear that arrivals are far noisier at the noise monitors than departures. Yet the QC value for departures is twice those of arrivals. Why are the noisier arrivals given a lower QC value?

Less than 2dB between the A320 and A20N. The A20N averaged 77.57dB LAmax on arrival at nmt #1.

Less than 1dB between the B738 and B38M for arrivals on nmt #1. The B38M still recorded an average arrival noise level of 78.82dB LAmax.

Less than 2dB between the A320 and A2ON and 1.55dB between the B738 and B38M for departures on nmt #1.

QC values have no consistency or relevance to what is being measured on the ground and how those most affected by noise are measured by a QC system.

The certified EPNdB values are not subject to change as per EU598/2014. However, the assigned QC values per EPNdB can be modified. Using a multiplier of 2 for each category of EPNdB is not appropriate for use at Dublin Airport. It is worth stating that the ICAO do not

provide guidance on the use of Noise Quota Systems and the quota count values assigned to certification bands. The ICAO certification relates to the EPNdB levels only. The quota count system was first introduced in the UK and they rationale for doubling/halving the quota count values for each 3dB band was based on the fact that noise power doubles every 3dB. However, a more realistic approach should use the perceived doubling of noise by the human ear which is every 9dB. The quota count system as it currently stands can reward an aircraft that reduces its noise certification level from, say, 87 EPNdB to 86.9 EPNdB by halving its quota count value. A 0.1 EPNdB reduction can equate to a reduction from 0.5 to 0.25 in quota count terms.

The proponents of Quota Count Systems state that the reduction in 3dB of noise power means 2 aircraft of 3dB less equates to the 1 noisier aircraft. That may be true from a noise power point of view but it's rare that 2 aircraft fly at the same time. 2 aircraft movements will mean 2 noise events to local residents in sequential order. It does not mean 2 parallel noise events.

The real measured data shows that a QC system such as the one proposed by the daa and ANCA is not fit for purpose and should not be deployed at Dublin Airport.

The data also casts a doubt on ANCA and its consultant's ability to properly interrogate the data and come up with independent analysis. ANCA has accepted the QC totals from the daa and only suggested to use an 8-hour count rather than a 6.5-hour count. However, the daa just simply increased the value from 7990 to 16260 and ANCA duly obliged and accepted it.

Table 3.2: Noise classifications and Quota Count in use by the UK Department of Transport (October 2021)

Noise Classification	Quota Count
Below 81 EPNdB	0
81 – 83.9 EPNdB	0.125
84 – 86.9 EPNdB	0.25
87 – 89.9 EPNdB	0.5
90 – 92.9 EPNdB	1
93 – 95.9 EPNdB	2
96 – 98.9 EPNdB	4
99 – 101.9 EPNdB	8
Greater than 101.9 EPNdB	16

Forecasts QC reference table

Aircraft code	Est QC Arrival	Est QC Departure
223	0.125	0.25
318	0.25	0.25
319	0.25	0.5
320	0.25	0.5
321	0.25	1
332	0.5	2
333	0.5	2
339	0.5	1
359	0.5	0.5
738	0.5	0.5
739	0.5	1
781	0.25	1
788	0.25	0.5
789	0.25	0.5
32A	0.25	0.5
32N	0.125	0.25
32Q	0.25	0.5

Aircraft code	Est QC Arrival	Est QC Departure
33F	0.5	2
738F	0.5	0.5
73H	0.5	0.5
73P	1	1
73W	0.5	0.5
75W	1	1
76F	2	2
76V	1	2
77L	1	2
77W	1	2
7M2	0.25	0.25
7M8	0.25	0.25

Aircraft code	Est QC Arrival	Est QC Departure
ABY	1	2
AT4	0.5	0.125
AT7	0.25	0.25
CNT	0	0
CS3	0.125	0.25
DH4	0.25	0
E70	0.25	0.5
E75	0.25	0.5
E90	0.125	0.5
E92	0.125	0.5
E95	0.125	0.5
ER4	0.125	0.125
GS5	0.125	0.25
Q84	0	0.25
SF3	0.25	0.25

The Quota Count System in the draft decision does not stop one single flight from the daa's forecasts at night. In fact, it does the opposite and allows unmitigated flights. How can this be a Balanced Approach?

It is also worth referring to the submission to ANCA (FIN-C338-ANCA-177) from Dr King from NUI Galway. In his conclusions, Dr King makes the following points:

- The proposed Quota system is an incomplete interpretation of that operated in the London airports. The London airports operate a Noise Quota System together with a movement limit. If the Dublin approach is based upon the London Stansted approach, then it should also include a movement limit.
- The use of a quota system based on EPNL fails to account for noise events. A movement limit in parallel with the noise quota would go some way to address this issue.
- If there is no movement limit, any aircraft movement with a quota count value of zero would in effect be unlimited, despite the fact that it is a noise generating movement. The total of 16,260 QC points far exceeds the totals in Gatwick, Heathrow, and Stansted. It should be reduced significantly. A reduction in this limit would go some way in to meet that stated objective of limiting and reducing the long-term adverse effects of aircraft noise on health and quality of life.

- The total of 16,260 was based on a goal of reducing the average fleet noise per movement. This does not necessarily lead to a decrease in overall noise levels. For 2022, 2023 and 2025, the average fleet noise per movement decreases, but the overall QC points increase each year. A more appropriate approach would be to deliver a reduction of QC instead.
- In this authors opinion a target QC of 14,000 in parallel with a movement limit would represent a more progressive approach. These should be considered minimal targets and I encourage ANCA to consider lower limits. The QC target of 14,000 is based on a slight improvement of 2018 data. An appropriate movement limit would also need to be determined. By analyzing the average relationship between the Movement/Noise Quota Limits described in the London airports, a movement limit of 21,000 would appear in line with international practice. Similar to the London schemes, these limits could be revised to account for summer/winter variation.
- The above limits are based on 2018 data, as 2018 is the year identified by the DAA in the development of the target QC/ATM. However, the data suggest the limits would also be applicable to 2017, which might be more appropriate to set as a pseudo baseline year against which improvements are assessed. This would align with the timing of EU Directive 2002/49/EC as well the European Commission's 'Towards Zero Pollution for Air, Water and Soil' Action Plan.

Dr King's specific comments have not been addressed in the Consultation Report. Dr King has extensive experience in the areas of acoustics, noise control, transportation and urban sustainability. He is currently Managing Editor of Noise/New International, a quarterly publication from the International Institute of Noise Control Engineering. He is a member of the European Commission Noise Expert Group, and in the past has served as member of the Board of the Institute of Noise Control Engineering (USA), and the International WELL Building Institute's Sound Concept Advisory Panel.

He is author/co-author of more than 70 academic journal papers, book chapters, conference papers and reports, including one book. He holds a B.A. B.A.I. Mechanical Engineering (2003), Postgraduate Diploma in Statistics (2007) and PhD (2008) in Environmental Acoustics all from Trinity College Dublin, Ireland. Following EU postdoctoral research on noise assessment and control, he established a start-up noise and vibration consulting company before moving to the only US university that offers specialist undergraduate programs in acoustics and music.

Dr King is eminently qualified to comment on noise and his views should be acknowledged and acted upon.

Attention is also drawn to comments in ANCA's report 'DRD Report 11 November 2021.pdf', where ANCA state that the Noise Quota Count System proposed "**does not inhibit the ability of Dublin Airport to meet its forecasts for passenger and ATM growth in the future**".

> ANCA is therefore conscious that under the Applicant's proposals, whilst the noise quota sets an operating restriction, it does not inhibit the ability of Dublin Airport to meet its forecasts for passenger and ATM growth in the future. This is due to the proposal setting the noise quota at a value for which the introduction of quieter aircraft will cater for more aircraft to be operated within the same noise quota in the future. As such, the proposed noise quota provides the incentive for Dublin Airport to use quieter aircraft in return for additional movements. This is only possible as the proposals do not include an aircraft movement limit, and providing Dublin Airport continues to meet the NAO.
>
> The Applicant's proposals include allowances for carry-overs and overruns which would allow the noise quota in one year to be increased by as much as 10%. However, ANCA notes that the

In section 1.6.2.2 of the Cost Effectiveness Methodology and Results report (Appendix J) it states:

"The Applicant's modelling shows that the annual night quota count (i.e. over the period 23:00 to 06:59) will be highest in 2025, at 15,892. This suggests that the 8-hour alternative noise quota limit of 16,260 as suggested by ANCA can be met without imposing any restrictions on how an airline may wish to operate from the airport subject to more restrictive restrictions on aircraft QC from 2030 onwards."

The report also lists the zero impact the Noise Quota Count System has on HSD and night-time noise priority figures:

Table J22: Reduction in people impacted in 2025 under different measures

Measure	Number of people no longer impacted compared with FWNM		Number of people impacted following measure	
	HSD	Night-time noise priority	HSD	Night-time noise priority
Permitted Operations	-14,083	-16	22,481	0
The Applicant's Proposed Noise Quota Scheme	0	0	36,564	16
Alternative Noise Quota Scheme	0	0	36,564	16
Most effective measure under HSD metric	-2,022	-16	34,542	0
Most cost-effective measure	-219	-16	36,345	0
The Applicant's preferred measure	442	-16	37,006	0

[15] Note that it was not possible to derive effectiveness measure Permitted Operations Scenario for Significantly Adversely Affected people due to data not being available.

33

The Quota Count System is simply a marketing ploy by the daa that has been accepted by ANCA. ANCA's own analysis shows that the Noise Quota System does not impact on the daa's plans nor does it introduce any cost as no flights will be reduced. This is farcical implementation of the Balanced Approach and shows categorically that there is no 'Balance' applied by ANCA.

14.2 ANCA CHANGES TO PRELIMINARY DECISION

In section 14.1 of the Regulatory Decision, ANCA outlay changes to the draft regulatory decision regarding Noise Quota System following submissions from cargo companies:

"Following publication of the DRD for consultation, ANCA received a number of submissions from cargo operators on the restrictions proposed to take effect from 1 January 2030. These submissions highlighted that, while the affected aircraft comprised 12% of the overall fleet mix, such aircraft are more concentrated in cargo operators' fleets".

"*Having regard to submissions received during the consultation period, ANCA has therefore decided to modify the post-2030 QC restriction as proposed. The RD has been changed so that Schedule A, Part 2, 2.1(d) and 2.1(e) as proposed in the DRD have been removed. Notwithstanding this, the overall QC scheme is likely to require the introduction of mechanisms to reduce the occurrences of high QC fleet movements during the night period*".

In the draft regulatory decision, Parts 2.1(d) and 2.1(e) were as follows:

"*d. No aircraft with a Quota Count of 2.0 or more shall be permitted to take off at the Airport during the night time from 1 January 2030*
e. No aircraft with a Quota Count of 1.0 or more shall be permitted to land at the Airport during the night time from 1 January 2030"

ANCA have rolled back on these conditions which cover the post 2030 period. ANCA reference a report by Altitude Aviation which is contained in Appendix N of the Regulatory Decision Report.

Altitude Aviation outline the material that was not given to them:

"However we do not have access to all of the forecast detail we consider necessary to provide a complete impact assessment:

1) There is no information as to which carriers are expected to operate the forecast Night Period ATMs: This makes it hard to determine e.g. whether or not the operator has the ability to switch out a non-compliant aircraft for a compliant aircraft.

2) There is no split of Night Period ATMs by arrivals/departures: as an aircraft's QC value differs depending on whether it is taking off or landing, this split may materially impact the number of Night Period ATMs at Dublin Airport that would be impacted".

On slide 14 Altitude Aviation outline the impacts of 2.1(d). They use a short timeframe of February 2022 to identify cargo flights and flights non-compliant with 2.1(d). They state that UPS would be the only carrier operating an aircraft type that would become non-compliant in 2030, the Boeing 767-300 (B763). Slide 14 only lists 5 departures for UPS using the 767-300. This is incorrect. There were 16 767-300 UPS departures during the night-time period in February 2022.

Regardless of the number of departures of B767-300 aircraft during the night-time period, ANCA have decided to roll back on 2.1(d) to facilitate a single cargo operator, UPS. No incentive for UPS to acquire quieter aircraft as a result of this decision. No discussion as to whether these movements could be switched to after 7am.

On slide 18 Altitude Aviation outline the impacts of 2.1(e) on cargo flights. They list only 28 flights that would be non-compliant (B737-400, B767-300, B767-200). From an analysis of night-time flights during February 2022, there were 106 arrivals from these aircraft. In January there were 111 arrivals and in March 114 arrivals. Therefore, these arrivals contribute significantly to the noise environment at night and in particular for those residents underneath the flight paths. The removal of 2.1(e) will increase significantly the noise impact at night.

In the conclusion on slide 22 Altitude Aviation state:

- "*It is not clear whether the regulatory changes would lead to a reduction in cargo services or services would be broadly maintained but with additional costs and/or worse service for end customers.*
- *The submissions from the carriers themselves do touch on this issue at a high level, although there is relatively little discussion of the specific impacts/costs associated with fielding a compliant fleet to DUB by 2030*".

The submissions to ANCA from the cargo companies give no detail on what the impacts would be in terms of costs and services. These companies operate on a global scale and can swop aircraft to suit operational needs. ANCA have provided no incentive for these cargo companies to modernise their fleet or to switch to using quieter aircraft during the night-time period or even switch their operations out of the night-time period. The daa have incentivised operators to use the night-time period in the past by facilitating lower landing and take-off charges and parking charges.

ANCA have incorrectly stated that the removal of 2.1(d) and 2.1(e) will have no impact of the night-time noise environment. It is clear that there are a large number of aircraft that would be non-compliant with 2.1(d) and 2.1(e). These aircraft are some of the noisiest aircraft operating at Dublin Airport, specifically at night, and ANCA have now rolled back on their decision to restrict their operations.

In section 14.1 of their Regulatory Decision Report, ANCA state:

"ANCA considered that the more stringent restrictions after 2030 would yield a small added benefit in terms of reducing individual noise exposure events without disproportionately restricting operations, as the aircraft affected by the proposed restrictions represented only 12% of the overall fleet mix. However, the measures were additional to those required to achieve the quantitative health objectives in the NAO and were intended to further the general objective in the NAO to limit and reduce aircraft noise".

On what basis have ANCA concluded that these more stringent restrictions after 2030 would yield a small added benefit? As shown earlier, there were 100 plus landings of non-compliant aircraft with 2.1(e) in February during the night period. This is not a small number, and they can greatly influence the average night-time noise levels and result in very high LAmax single noise events.

The NQS agreed by ANCA to allow a quota count of 16260 facilitates continuing growth at Dublin Airport without any impact on the daa's predictions and forecasts. The removal of 2.1(d) and 2.1(e) further shows that ANCA are not interested in restricting the noisiest aircraft beyond 2030 and therefore there are no incentives or obligations on the operators to reduce their noisiest aircraft. ANCA have provided no modelling data on the effects of 2.1(d) and 2.1(e) and what the impacts are on the numbers of people affected by noise at night.

The ANCA decision could enable the noisier passenger aircraft owners to relocate their noisier aircraft to Dublin for the night period, which was the exact opposite intention of 2.1(d) and 2.1(e) from the draft regulatory decision.

15.0 HSE SUBMISSIONS

15.1 SUMMARY

- The net effect of the revised EIAR is a worsening of the health impacts outlined by the HSE in their original submission to the Planning Authority. A 17.2% increase in the number of people highly annoyed and an increase of 51.6% in people highly sleep disturbed. The residual effects of the 2025 Proposed scenario (without restrictions) compared with the 2025 Permitted scenario (with restrictions) are a net significant adverse effect for 10474 people in terms of the Lnight metric.
- ANCA did not take into account the submissions to the Planning Authority and thus excluded the HSE's submission.
- The HSE concludes that:
    - All efforts should be made by the DAA to ensure as many people as possible are protected from the adverse health effects associated with aircraft noise as outlined above in this report. This must include reducing aircraft noise levels to below 45 dB Lden, and for night noise exposure to below 40 dB Lnight".
    - "The EHS is of the opinion that The World Health Organisation's Environmental Noise Guidelines of 45 dB Lden and 40 dB Lnight should have been used for ground noise assessments".

15.2 SUBMISSION TO PLANNING AUTHORITY

The HSE Environmental Health section made a submission, 'HES.pdf' in Appendix E, dated 28/01/2021 on planning application F20A/0668 by the daa regarding the removal of night-time flight restrictions at Dublin Airport.

Since the initial application by the daa, there has been a revised application submitted by the daa which incorporated a revised EIAR. The HSE EHS did not make a formal submission on this revised application. In parallel with the Planning Authority, the Aircraft Noise Competent Authority (ANCA) initiated their process in relation to the Aircraft Noise Bill. The planning application is on hold until ANCA adjudicate on noise. This is a separate statutory process to the Planning Authority and ANCA have not considered any of the submissions made to the Planning process. In effect, the HSE submission will not form part of ANCA's process unless it is resubmitted to ANCA. ANCA have made a draft decision on noise and published a draft Noise Abatement Objective (NAO) and published a draft Regulatory decision on the daa's application. This draft decision did not take the HSE's submission into account. ANCA may not be legally obliged to consider submissions to the Planning Authority, but it certainly does not meet the spirit of public consultation. ANCA must provide justification for refusing to take submissions to the Planning Authority into account.

Note:

In the HSE's submission the figures for 2025 quoted were the figures for 2025 Baseline and not 2025 Relevant Action. 2025 Baseline is the scenario if the restrictions stay in place. 2025 Relevant Action is the scenario with the restrictions removed and what the daa were applying for.

15.3 LDEN

In the first part of the submission, reference is made to the WHO's 45 dB Lden strong recommendation.

It states that 110234 people were Highly Annoyed (HA) in 2018, rising to 115740 in 2019. And the number of people exposed to >65 dB Lden increased from 251 to 285.

Figures for 2022 Baseline and 2025 Baseline are provided showing the drop in HA figures to 65227 and 63316 and for > 65dB Lden, the figures reduced to 133 and 128.

The submission concludes:

"***While the EHS welcomes the significant reduction in the people exposed to airline noise between the 2018/2019 baseline and the 2022/2025 forecast baseline scenario it still acknowledges that a significant proportion of people, namely 63316 people assessed as highly annoyed and 128 people exposed to at least a high noise level based on the 2025 baseline scenario, will still be exposed to airline noise above the WHO recommendation of 45Lden.***"

The 2022 and 2025 Baseline scenarios are the situation if the planning restrictions are not amended. These are the forecasts if the original 2007 planning conditions are left intact. The HSE EHS rightly acknowledges that there are 63316 people assessed as being highly annoyed using the WHO's submission exposure curves.

However, the submission failed to list the population figures for the 2022 and 2025 Relevant Action scenarios. The 'Relevant Action' is the amending of the operating restrictions which leads to a large increase in the population highly annoyed compared to the status quo or Baseline scenarios.

Table 13-29 in the original EIAR lists the HA values for 2022 Baseline compared to 2022 Relevant Action.

Below the table it states:

"*Comparing the 2022 Relevant Action scenario with the 2022 Baseline, the number of people exposed to aircraft noise is forecast to increase, for all contour levels. The number of people assessed as highly annoyed by aircraft noise* ***increases by 6% from 65,227 to 69,428****. The number of people exposed to at least a high level of noise (i.e. 65 dB Lden or above)* ***increases from 133 to 227*** *excluding consented developments."*

Therefore, the number of people highly annoyed in 2022 would be **69428** and the number exposed to >65 dB Lden would be **227** assuming the daa's Relevant Action application was granted.

Table 13-29: Number of people highly annoyed – 2022 Relevant Action vs Baseline Scenarios

Scenario	No. People Highly Annoyed	
	Excluding Consented Developments	Including Consented Developments
2022 Relevant Action	69,428	78,534
2018 Baseline	110,234	120,201
2022 Baseline	65,227	74,321
2025 Consented	125,742	136,170

Comparing the 2022 Relevant Action scenario with the 2018 Baseline, the number of people exposed to aircraft noise is forecast to reduce, for all contour levels except 70 dB L_{den}, which increases from 25 to 32 people. Consequently the number of people assessed as highly annoyed by aircraft noise also decreases, specifically by

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37% from 110,234 to 69,428. The number of people exposed to at least a high level of noise (i.e. 65 dB L_{den} or above) decreases from 251 to 227 excluding consented developments.

Comparing the 2022 Relevant Action scenario with the 2022 Baseline, the number of people exposed to aircraft noise is forecast to increase, for all contour levels. The number of people assessed as highly annoyed by aircraft noise increases by 6% from 65,227 to 69,428. The number of people exposed to at least a high level of noise (i.e. 65 dB L_{den} or above) increases from 133 to 227 excluding consented developments.

Table 13-43 compares people highly annoyed between 2025 Relevant Action and Baseline scenarios.

Below the table it states:

"*Comparing the 2025 Relevant Action scenario with the 2025 Baseline, the number of people exposed to aircraft noise is forecast to increase for all contour levels. The number of people assessed as highly annoyed by aircraft noise* ***increases by 7% from 63,316 to 67,760****. The number of people exposed to at least a high level of noise (i.e. 65 dB Lden or above****) increases from 128 to 218****, excluding consented developments."*

Therefore, the number of people highly annoyed in 2025 would be **67760** and the number exposed to >65 dB Lden would be **218** assuming the daa's Relevant Action application was granted.

Table 13-43: Number of people highly annoyed – 2025 Relevant Action vs Baseline Scenarios

Scenario	No. People Highly Annoyed	
	Excluding Consented Developments	Including Consented Developments
2025 Relevant Action	67,760	76,809
2018 Baseline	110,234	120,201
2025 Baseline	63,316	72,337
2025 Consented	125,742	136,170

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Comparing the 2025 Relevant Action scenario with the 2018 Baseline, the number of people exposed to aircraft noise is forecast to reduce at lower contour levels but increase at higher contour levels. Overall the number of people assessed as highly annoyed by aircraft noise decreases by 39% from 110,234 to 67,760. The number of people exposed to at least a high level of noise (i.e. 65 dB L_{den} or above) decreases from 251 to 218 excluding consented developments.

Comparing the 2025 Relevant Action scenario with the 2025 Baseline, the number of people exposed to aircraft noise is forecast to increase for all contour levels. The number of people assessed as highly annoyed by aircraft noise increases by 7% from 63,316 to 67,760. The number of people exposed to at least a high level of noise (i.e. 65 dB L_{den} or above) increases from 128 to 218, excluding consented developments.

15.4 LNIGHT

In the next first part of the submission, reference is made to the WHO's 40 dB Lnight strong recommendation.

It states that 42260 people were Highly Sleep Disturbed (HSD) in 2018, rising to 47044 in 2019. And the number of people exposed to >55 dB Lnight increased from 753 to 1533.

Figures for 2022 Baseline and 2025 Baseline are provided showing the drop in HSD figures to 19690 and 19464 and for > 55dB Lnight, the figures reduced to 284 and 281.

The submission concludes:

"***While the EHS welcomes the significant reduction in the people exposed to airline noise between the 2018/2019 baseline and the 2022/2025 forecast baseline scenario it still acknowledges that a significant proportion of people, namely 19464 people assessed as highly sleep disturbed and 281 people exposed to at least a high noise level based on the 2025 baseline scenario, will still be exposed to airline noise above the WHO recommendation of 40Lnight.***"

The 2022 and 2025 Baseline scenarios are the situation if the planning restrictions are not amended. These are the forecasts if the original 2007 planning conditions are left intact. The HSE EHS rightly acknowledges that there are ***19464*** people assessed as being highly sleep disturbed using the WHO's submission exposure curves.

However, the submission failed to list the population figures for the 2022 and 2025 Relevant Action scenarios. The 'Relevant Action' is the amending of the operating restrictions which leads to a large increase in the population highly annoyed compared to the status quo or Baseline scenarios.

Table 13-36 in the original EIAR lists the HA values for 2022 Baseline compared to 2022 Relevant Action.

Below the table it states:

"*Comparing the 2022 Relevant Action scenario with the 2022 Baseline, the number of people exposed to aircraft noise is forecast to increase, for all contour levels. Consequently, the number of people assessed as highly sleep disturbed by aircraft noise also* ***increases, specifically by 24% from 19,690 to 24,355****. The number of people exposed to at least a high level of noise (i.e. 55 dB Lnight or above)* ***increases from 284 to 1,152*** *excluding consented developments."*

Therefore, the number of people highly sleep disturbed in 2022 would be **24355** and the number exposed to >55 dB Lnight would be **1152** assuming the daa's Relevant Action application was granted.

Table 13-36: Number of people highly sleep disturbed – 2022 Relevant Action vs Baseline Scenarios

Scenario	No. People Highly Sleep Disturbed	
	Excluding Consented Developments	Including Consented Developments
2022 Relevant Action	24,355	29,812
2018 Baseline	42,260	48,062
2022 Baseline	19,690	24,479
2025 Consented	33,207	38,415

Comparing the 2022 Relevant Action scenario with the 2018 Baseline, the number of people exposed to aircraft noise is forecast to reduce at most contour levels but increase at the contour levels of 55 and 60 dB L_{night}. Overall the number of people assessed as highly sleep disturbed by aircraft noise decreases by 42% from 42,260 to 24,355. However, the number of people exposed to at least a high level of noise (i.e. 55 dB L_{night} or above) increases from 753 to 1,152 excluding consented developments.

Comparing the 2022 Relevant Action scenario with the 2022 Baseline, the number of people exposed to aircraft noise is forecast to increase, for all contour levels. Consequently, the number of people assessed as highly sleep disturbed by aircraft noise also increases, specifically by 24% from 19,690 to 24,355. The number of people exposed to at least a high level of noise (i.e. 55 dB L_{night} or above) increases from 284 to 1,152 excluding consented developments.

Table 13-50 in the original EIAR lists the HA values for 2025 Relevant Action and Baseline scenarios.

Below the table it states:

"*Comparing the 2025 Relevant Action scenario with the 2025 Baseline, the number of people exposed to aircraft noise is forecast to increase, for all contour levels. Consequently, the number of people assessed as highly sleep disturbed by aircraft* ***noise increases by 26% from 19,464 to 24,456****. The number of people exposed to at least a high level of noise (i.e. 55 dB Lnight or above)* ***increases from 281 to 1,157*** *excluding consented developments."*

Therefore, the number of people highly sleep disturbed in 2025 would be **24456** and the number exposed to >55 dB Lnight would be **1157** assuming the daa's Relevant Action application was granted.

Below is a summary of the noise metrics from the various scenarios from the original planning application in December 2020.

The 2025 Relevant Action clearly increases the number of people affected by noise compared to 2025 Baseline.

Scenario	Highly Annoyed	Highly Sleep Disturbed	>65 dB Lden	>55 dB Lnight
2018 Baseline	110234	42260	251	753
2022 Baseline	65227	19690	133	284
2022 Relevant Action	69428	24355	227	1152
2025 Baseline	63316	19464	128	281
2025 Relevant Action	**67760**	**24456**	**218**	**1157**

15.5 REVISED EIAR

With the revised application by the daa, the noise statistics changed as the daa changed to use dual runways simultaneously between 06:00-08:00 and provided revised passenger growth forecasts.

What has changed since the EIAR was submitted in December 2020?

This EIAR chapter has been updated in response to a Request for Further Information (RFI) from Fingal County Council dated 19/02/2021. As well as several minor corrections, including minor removals from and additions to the earlier text, the chapter has been revised to:

- Address additional assessment years requested by the Council
- Respond to the latest passenger growth forecasts at Dublin Airport

In a change to the modelled runway usage, the revised EIAR assumes that in 2025 and 2035 both parallel runways are used for departures in the 06:00 to 08:00 i.e. semi-mixed mode. For 2022, it is assumed that segregated mode is in use 06:00 to 08:00 (no change from December EIAR).

The EIAR has been updated to account for this change and all modelling and assessment are revised accordingly. The above does not change the description of the Relevant Action.

Using tables 13-23, 13-29, 13-40, 13-45 and 13-50 of the revised EIAR:

Scenario	Highly Annoyed	Highly Sleep Disturbed	>65 dB Lden	>55 dB Lnight
2018 Baseline	110238	42260	251	753
2022 Permitted	50603	18789	94	222
2022 Proposed	52713	19188	142	356
2025 Permitted	64241	22500	119	280
2025 Proposed	**79405**	**37080**	**196**	**1059**

15.6 ORIGINAL EIAR VS REVISED EIAR

Comparing the original planning application in December 2020 to the revised application and focusing on the 2025 Relevant Action and 2025 Proposed scenarios, which are the scenarios assuming the application is granted to remove the night-time operating restrictions, it is very evident that the revised application (with the revised growth forecast and dual runways for departure between 06:00-08:00) leads to a substantial increase in people highly annoyed (**+17.2%**) and highly sleep disturbed (**+51.6%)** compared to the original application.

Scenario	Highly Annoyed	Highly Sleep Disturbed	>65 dB Lden	>55 dB Lnight
2025 Relevant Action	67760	24456	218	1157
2025 Proposed	**79405**	**37080**	**196**	**1059**

15.7 RESIDUAL EFFECTS

Section 13.9.8 of the revised EIAR gives a summary of the Residual Effects of noise which takes account of the effect of the residential insulation schemes.

In section 13.9.10 it states:

"*Considering the Assessment Year of 2025, the residual effects of the Proposed Scenario when compared to the Permitted Scenario are a net significant adverse effect for 46 people in terms of the Lden metric and a* ***net significant adverse effect for 10,474*** *people in terms of the Lnight metric*."

Therefore, by granting permission to remove the night-time restrictions, and taking the insulation schemes into account, a net 10474 people will be significantly adversely affected in 2025 compared with the existing restrictions being left in place.

Residual Effects

13.9.8 The residual effects, after the benefit of the residential sound insulation schemes has been allowed for, are summarised in Table 13-64. The table includes all people in existing residential receptors who are exposed to at least 45 dB L_{den} or 40 dB L_{night} in at least one of the scenarios.

Table 13-64: Summary of Residual Air Noise Effects, Proposed vs Permitted

Year	L_{den} Residual Effects			L_{night} Residual Effects		
	Significant Beneficial	Significant Adverse	Not Significant	Significant Beneficial	Significant Adverse	Not Significant
2022	79	10	368,727	151	8,985	166,605

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2025	8	54	511,742	86	10,560	257,813
2035	0	20	255,657	12	4,284	131,432

13.9.9 Considering the Assessment Year of 2022, the residual effects of the Proposed Scenario when compared to the Permitted Scenario are a net significant beneficial effect for 69 people in terms of the L_{den} metric and a net significant adverse effect for 8,834 people in terms of the L_{night} metric.

13.9.10 Considering the Assessment Year of 2025, the residual effects of the Proposed Scenario when compared to the Permitted Scenario are a net significant adverse effect for 46 people in terms of the L_{den} metric and a net significant adverse effect for 10,474 people in terms of the L_{night} metric.

15.8 HSE EHS SUBMISSION TO ANCA

In a submission to ANCA's consultation, the HSE EHS section state that in relation to Condition 1 of the Draft Regulatory Decision, the '*rationale given is not a rationale for revoking condition 5 of the current planning permission, but is a rationale for the Noise Quota Scheme proposed*'. It further states that in relation to condition 2, the '*rationale given is not for amending the existing conditions is not given. The reasons given are for the new controls, which are less stringent than existing*'.

The HSE submission states that the existing Planning Conditions are in place to protect public health and that:

'*The operating restrictions already exist and the Draft Regulatory Decision is to revoke and amend them, there should therefore be a clear rationale for this and clear evidence that the mitigation measures proposed will ensure there is not a diminishing of health protection that is compliant with the existing operating restrictions'*.

It is very evident that revoking and amending the existing conditions will result in a diminishing of health protection. From table 7.21 of the Regulatory Decision Report the number of people HSD increases from 22500 to 37080 by revoking and amending the existing planning conditions. The populations exposed to night-time noise >55dB Lnight will increase from 280 to 1059.

Table 7.21: Population HSD, HA and exposed above the NAO priorities in 2019 and in 2025 for the modelled runway use and restriction scenarios

Scenario	Population HSD	Population > 55 dB L_{night}	Population HA	Population > 65 dB L_{den}
2019 Situation	47,045	1,533	115,738	285
2025 P01 30.4 mmpa	22,500	280	64,241	119
2025 P02 32.0 mppa	37,080	1,059	79,405	196

The HSE state that if the planning authority and ANCA are going to increase the hours of operation of the runways, then they must ensure all who are significantly impacted have the opportunity of mitigation. This is not the case with the current application as only those 'highly significantly' and 'profoundly' affected are offered mitigation in the form of insulation.

The HSE references the WHO 2018 Guidelines and note that 45dB Lden and 40dB Lnight are strong recommendations based on a complete review of the health research around aircraft noise. They further reiterate their view that it is '*important that the noise mitigation measures*

are made available to all parties that are significantly impacted by the proposal to ensure protection of health'.

The current proposal has failed to cater for all populations significantly affected by noise. It will result in a diminishing of health protection.

Astonishingly the HSE submissions are not mentioned in the Consultation Report. It is also worth noting that ANCA never formally requested the HSE to make a submission to their consultation process. It is a serious dereliction of their duties to not invite the State agency whose role is to protect Public Health.

15.9 CONCLUSION

In its conclusion the HSE states that:

- "*All efforts should be made by the DAA to ensure as many people as possible are protected from the adverse health effects associated with aircraft noise as outlined above in this report. This must include reducing aircraft noise levels to below 45 dB Lden, and for night noise exposure to below 40 dB Lnight*".
- "*The EHS is of the opinion that The World Health Organisation's Environmental Noise Guidelines of 45 dB Lden and 40 dB Lnight should have been used for ground noise assessments*".
- "*The Conditions 3(d) and 5 were put in place to protect public health so if the planning authority are going to increase the hours of operation they must ensure all who are significantly impacted have the opportunity of mitigation*".
- HSE not invited by ANCA to make a submission to their Consultation process
- No reference to the HSE submissions in the Consultation Report

16.0 HEALTH AND HEALTH COSTS

16.1 SUMMARY

- Imperative that independent noise monitoring is conducted on the dwellings most affected by aviation noise from Dublin Airport, including properties already insulated by the daa.
- Imperative that a health study be carried out on the population surrounding Dublin Airport to understand the health of the population relative to the norm.
- ANCA and the daa have totally ignored the objective of Target 2 of the EU Action Plan "*Towards a zero pollution for air, water and soil*" adopted in May 2021 as the targets for 2030 are set at far higher noise levels in 2019 and 2018 which exceed the baseline year of 2017 required under the EU Action Plan. The selection of 2019 as the baseline is contrary to ANCA's own SEA document used to screen the project.
- Neither ANCA nor the daa have evaluated the serious health effects and costs associated with such health effects of their proposed modification to the current restrictions in place at Dublin Airport. This has serious health implications for the inhabitants within the St Margarets The Ward area.
- ANCA and the daa are proposing noise insulation as a mitigation measure to night-time noise increases within the St Margarets The Ward communities. This is contrary to Fingal County Council advice within their own Development Plan and testing carried out within the St Margarets The Ward area on housing that has already been insulated by the daa recently indicates the guidance referred to by Fingal County Council and the WHO cannot be achieved and will cause serious health issues of those affected by the proposed increase in night-time noise.
- No mitigation measures are proposed by the daa or ANCA to solve the health implications being imposed by the removal of the existing restrictions.

16.2 LATEST RESEARCH

Latest research since the WHO 2018 Guidelines has been collated in the review paper '*Environmental risk factors and cardiovascular diseases: a comprehensive expert review*' (https://academic.oup.com/cardiovascres/advance-article/doi/10.1093/cvr/cvab316/6381568). This review forms part of the medical health report from Professor Münzel which is part of this submission. The supplementary material associated with the review summarises the latest findings:

Table S1. Epidemiological/observational evidence for an association between traffic noise and cardiovascular disease, events, and mortality with focus on recent studies.

First author / year	Population / cohort	Noise sources	Major outcomes	Ref
Roca-Barceló, 2021	21,936 CVD deaths	Aircraft noise	CVD and CHD mortality risk tended to increase with increasing levels of aircraft noise (L_{dn}), while no linear trend was found for stroke mortality.	1
Kupcikova, 2021	502,651 subjects	Road traffic noise	Road traffic noise exposure (L_{den} >65 vs. ≤55 dB(A)) led to 0.77% (95% CI 0.60-0.95) higher SBP, 0.49% (95% CI 0.32-0.65) higher DBP, 0.79% (95% CI 0.11-1.47) higher triglycerides, and 0.12% (95% CI –0.04-0.28) higher glycated hemoglobin.	2
Yankoty, 2021	1,065,414 subjects	Total environmental / transportation noise	The HRs for incident MI were 1.12 (95% CI 1.08-1.15), 1.11 (95% CI 1.07-1.14), and 1.10 (95% CI 1.06-1.14) per 10 dB(A) increase in L_{Aeq24}, L_{den}, and L_{night}, respectively.	3
Gilani, 2021	909 subjects	Road traffic noise	An OR of 2.25 (95% CI 1.38-3.67) for the prevalence of CAD per 5 dB(A) increase in road traffic noise (L_{den}) was found.	4
Saucy, 2021	24,886 CVD deaths	Aircraft noise	Acute increases in aircraft noise 2 hours preceding death were associated with total CVD mortality (OR 1.44, 95% CI 1.03-2.04) for the highest group of exposure (L_{Aeq} >50 vs. <20 dB).	5
Baudin, 2021	5,860 subjects	Aircraft noise	Aircraft noise levels per 10 dB(A) increase in L_{night} increased the odds of antihypertensive medication by 43% (OR 1.43, 95% CI 1.19-1.73).	6
Osborne, 2020	498 subjects	Combination of road traffic and aircraft noise	Higher noise exposure per 5 dB(A) increase in L_{Aeq24} predicted major CV events (HR 1.341, 95% CI 1.147-1.567).	7
Bai, 2020	37,441 cases of incident acute MI and 95,138	Road traffic noise	Road traffic noise (L_{Aeq24}) per IQR increase was associated with an elevated risk of incident acute MI (HR 1.07, 95% CI 1.06-1.08) and CHF (HR, 1.07 95% CI 1.06-1.09).	8

	cases of incident CHF			
Thacher, 2020	52,758 subjects	Road traffic noise	At the most exposed façade, road traffic noise per IQR increase was associated with a 13% (HR 1.13, 95% CI 1.06-1.19) and 11% (HR 1.11, 95% CI 0.99-1.25) higher CVD and stroke mortality, respectively. At the least exposed façade, road traffic noise remained to be associated with CVD (HR 1.09, 95% CI 1.03-1.15), IHD (HR 1.10, 95% CI 1.01-1.21), and stroke (HR 1.06, 95% CI 0.95-1.19) mortality.	9
Thacher, 2020	52,053 subjects	Road traffic noise	There was no association between road traffic noise and filled prescriptions for antihypertensive drugs.	10
Andersson, 2020	6,304 men	Road traffic noise	The HRs were 1.08 (95% CI 0.90-1.28) for CV mortality, 1.14 (95% CI 0.96-1.36) for IHD incidence, and 1.07 (95% CI 0.85-1.36) for stroke incidence in response to road traffic noise (L_{Aeq24} >60 vs. <50 dB.	11
Shin, 2020	Subjects without a history of hypertension (701,174) or diabetes mellitus (914,607)	Road traffic noise	An increase in L_{Aeq24} per 10 dB(A) was associated with an 8% increase in incident diabetes mellitus (HR 1.08, 95% CI 1.07-1.09) and a 2% increase in incident hypertension (HR 1.02, 95% CI 1.01-1.03). Similar estimates were obtained for L_{night}.	12
Baudin, 2020	6,105 subjects	Aircraft noise	An increase per 10 dB(A) in L_{night} was associated with an increased risk of hypertension (RR 1.03, 95% CI 1.01-1.06$_t$). An association was also found between aircraft noise annoyance and hypertension risk (RR 1.06, 95%CI 1.00-1.13 for highly annoyed vs. not highly annoyed).	13
Pyko, 2019	20,012 subjects	Road traffic, railway, aircraft noise	In subjects exposed to all three traffic noise sources at ≥45 dB L_{den}, risks of IHD were elevated with a HR of 1.57 (95% CI 1.06-2.32), and a comparable observation for stroke (HR 1.42, 95% CI 0.87-2.32).	14
Héritier, 2019	4.4 million subjects	Road traffic, railway, aircraft	MI mortality was increased in response to road traffic (HR 1.034, 95% CI 1.014-1.055), railway (HR 1.020, 95% CI	15

		noise	1.007-1.033), and aircraft noise (HR 1.025, 95% CI 1.005-1.046) per 10 dB increase in L_{den}.	
Héritier, 2018	4.41 million subjects	Combination of road traffic, railway, aircraft noise	For the core night, the highest HR was observed for IHD mortality (1.025, 95% CI 1.016-1.034), while this association was lower for the daytime (1.018, 95% CI 1.009-1.028). HF mortality and daytime noise was associated with the highest HR (1.047, 95% CI 1.027-1.068).	16
Pyko, 2018	4,854 subjects	Road traffic, railway, aircraft noise	Aircraft noise increased the incident risk of hypertension by 16% (HR 1.16, 95% CI 1.08-1.24) per 10 dB increase in L_{den}. Road traffic and railway noise were not associated with incidence of hypertension.	17
Yang, 2018	663 subjects	Road traffic noise	Road traffic noise per 5 dB(A) increase was associated with the prevalence of CVD (OR 2.23, 95% CI 1.26-3.93).	18
Cai, 2018	21,081 incident CVD cases	Road traffic noise	No associations were found between road traffic noise and incident CVD, IHD, or CBVD in the total population.	19
Hahad, 2018	14,639 subjects	Road traffic, railway, aircraft noise	Traffic-related noise annoyance is associated with increased prevalence of AF.	20
Héritier, 2017	4.41 million subjects	Road traffic, railway, aircraft noise	HRs for MI mortality were per 10 dB increase in L_{den} 1.038 (95% CI 1.019-1.058) for road traffic, 1.018 (95% CI 1.004-1.031) for railway, and 1.026 (95% CI 1.004-1.048) for aircraft noise.	21
Zeeb, 2017	137,577 cases and 355,591 controls	Road traffic, railway, aircraft noise	There was no association between any of the traffic noise sources and incident hypertension. Likewise, no association between nighttime noise levels and hypertension was found. For the group of subjects with newly diagnosed hypertension followed by hypertensive heart disease, the ORs were elevated.	22
Fuks, 2017	41,072 subjects	Road traffic noise	A weak relationship between road traffic noise and incident self-reported hypertension was found, whereas no conclusive association with measured hypertension was established.	23

Pitchika, 2017	2,552 subjects	Road traffic noise	No association between road traffic noise (L_{Aeq24}) and prevalent hypertension was found.	24
Roswall, 2017	50,744 subjects	Road traffic noise	Road traffic noise was associated with a higher risk of MI, with a HR of 1.14 (95% CI 1.07-1.21) per IQR increase in L_{den}.	25
Evrard, 2017	1,244 subjects	Aircraft noise	Only in men, a 10 dB(A) increase in aircraft noise (L_{night}) was associated with risk of hypertension (OR of 1.34, 95% CI 1.00-1.97).	26
Dimakopoulou, 2017	780 subjects	Aircraft noise	A 10 dB increase in L_{night} resulted in an OR of 2.63 (95% CI 1.21-5.71) for hypertension and of 2.09 (95% CI 1.07-4.08) for doctor-diagnosed cardiac arrhythmia.	27
Sørensen, 2017	57,053 subjects	Road traffic noise	An IRR of 1.14 for HF (95% CI 1.08-1.21) per IQR increase in L_{den} road traffic noise was found.	28
Seidler, 2016	19,632 cases and 834,734 controls	Road traffic, railway, aircraft noise	A 10 dB increase in L_{Aeq24} was associated with higher odds of MI in response to road traffic (2.8%, 95% 1.2-4.5) and railway noise (2.3%, 95% CI 0.5-4.2), but not aircraft noise. Aircraft noise levels of 60 dB and above were associated with increased MI risk (OR 1.42, 95% CI 0.62-3.25).	29
Recio, 2016	Cohort of subjects ≥65 years	Road traffic noise	Short-term road traffic noise increased the risk of death from IHD, MI, and CBVD.	30
Monrad, 2016	57,053 subjects	Road traffic, railway noise	A 10 dB increase in L_{den} road traffic noise was associated with a 6% increased risk of AF (IRR 1.06, 95% CI 1.00-1.12), which was weaker after further adjustment for air pollutants. AF risk was not related to railway noise.	31
Sørensen, 2011	57,053 subjects	Road traffic noise	An IRR of 1.14 for stroke (95% CI 1.03-1.25) per 10 dB increase in L_{den} road traffic noise was found.	32
Beelen, 2009	120,852 subjects	Road traffic noise, traffic intensity	Traffic intensity was associated with CV mortality, with highest RR of 1.11 (95% CI 1.03-1.20 per increase in 10,000 motor vehicles/24 h). Road traffic noise (>65 dB(A)) was associated with increased risk of IHD (RR 1.15, 95% CI 0.86-1.53) and HF mortality (RR 1.99, 95% CI 1.05-3.79), which was attenuated after further adjustment air pollution and traffic intensity.	33

CVD: Cardiovascular disease, CHD: Coronary heart disease, L_{dn}: Day-night noise levels, SBP: Systolic blood pressure, DPB: Diastolic blood pressure, HR: Hazard ratio, MI: Myocardial Infarction, $L_{Aeq(time\ period)}$: Noise levels over a certain period of time, L_{night}: Night noise levels, IHD: Ischemic heart disease, CHF: Congestive heart failure, IQR: Interquartile range, CBVD: Cerebrovascular disease, dB: Decibel, OR: Odds ratio, CI: Confidence interval, CAD: Coronary artery disease, L_{den}: Day-evening-night noise levels, AF: Atrial fibrillation, IRR: Incidence rate ratio, RR: Relative risk

It is important to point out that a majority of the above research did not form part of the WHO 2018 Guidelines as it wasn't available in time for the review. Neither ANCA nor the daa have considered this latest research. ANCA as the noise regulator has a duty to keep abreast of latest scientific research in order to perform its duties. HA and HSD figures are real people. ANCA needs to understand that these are real people and families and not just numbers. It will be responsible for inflicting night noise on residents and damaging their health. Who do residents sue for their ill health? ANCA and Fingal County Council will be responsible for removing the restrictions. They cannot hide behind the Aircraft Noise Bill as they have crafted the Noise Abatement Objective to allow tens of thousands of people to be Highly Sleep Disturbed. The onus rests with ANCA and Fingal County Council.

16.3 HEALTH

In the EIAR, chapter 7 is devoted to Population and Human Health.

The European Environmental Agency (EEA) published a report in 2020 titled 'Environmental Noise in Europe – 2020'. The report states that:

"Chronic exposure to environmental noise has significant impacts on physical and mental health and well-being. Exposure to environmental noise is a widespread problem in Europe, with at least one in five people exposed to levels considered harmful to health. Given the negative impacts on human health and the large number of people affected, environmental noise is therefore a significant concern for citizens and policy makers. Reducing environmental noise is a key objective under the Seventh Environment Action Programme (7th EAP) and the Environmental Noise Directive (END)."

Key findings of the report:

Environmental noise from road, rail, aircraft and industry sources affects millions of people, causing significant public health impacts

• Long-term exposure to environmental noise is estimated to cause

- 12000 premature deaths and
- contribute to 48000 new cases of ischaemic heart disease per year in the European territory.
- It is estimated that 22 million people suffer chronic high annoyance and
- 6.5 million people suffer chronic high sleep disturbance.
- As a result of aircraft noise, 12500 schoolchildren are estimated to suffer learning impairment in school.

• These significant health impacts are most likely to be underestimated, with new WHO evidence demonstrating effects at levels below the obligatory END reporting thresholds. In addition, the END does not comprehensively cover all urban areas, roads, railways and airports across Europe.

(i.e. Noise below current END reporting values also cause health effects)

• Exposure to environmental noise does not affect everyone equally. Socially deprived groups, as well as groups with increased susceptibility to noise, may suffer more pronounced health-related impacts of noise.

The report further states that the policy objectives on environmental noise have not been achieved. The number of people exposed to high levels of noise has not decreased. The key objective of the 7th EAP of significantly reducing noise pollution in the EU and moving closer to the WHO recommended levels by 2020 has not been achieved. Fingal County Council and ANCA need to explain how they moved closer to the WHO recommended levels by 2020. Note this is recommended levels and not interim levels. The 7th EAP also categories 'High' noise levels as those levels **> 55 dB Lden and > 50 dB Lnight**. Fingal County Council and ANCA need to support these definitions of high noise.

The report states that 4 million people are exposed to high levels of aircraft noise. It also states how noise pollution is a threat not only to humans but also to wildlife.

"Anthropogenic noise affects a wide variety of terrestrial and marine wildlife species causing a range of physiological and behavioural responses. These can reduce reproductive success and increase mortality and emigration, resulting in lower population densities."

The noise contours for Dublin Airport extend over the Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). No analysis has been carried out on the effects of aircraft noise on these areas.

The new divergent flight routes and potential night-time use of the North Runway has not been studied for their effects on existing wildlife and in particular bird species. These flight routes have changed since the original EIS in 2004-2007. It has become very apparent in Fingal that many bird species are now thriving under the quieter skies and the effects of changing flight routes and operation times need to be examined.

Environmental noise is the second biggest environmental killer after air pollution.

The WHO have strongly recommended that noise from aircraft should be reduced below 45dB Lden and 40dB Lnight as aircraft noise above these levels are associated with adverse health effects such as cardiovascular disease, hypertension and cognitive impairment in children. The WHO report states that "1 million healthy years of life are lost every year in the EU". A 2011 WHO report places "the burden of disease from environmental noise as the 2nd highest after air pollution". Interestingly the WHO 2018 report states that overall, the GDG "estimated that the benefits gained from minimizing adverse health effects due to aircraft noise exposure outweigh the possible (economic) harms".

Questions need to be asked of Fingal County Council as to why no health study has ever been conducted on the residents of Fingal living in the vicinity of Dublin Airport. The Council is fixated on the economic benefits of the airport to the detriment of the population of Fingal.

In addition to the WHO report I would like to point to a recent paper at Euronoise 2018 titled 'Transportation noise and incidence of hypertension' (http://www.euronoise2018.eu/docs/papers/92_Euronoise2018.pdf). The results "*indicated a clear association for aircraft noise" and "a particularly high risk estimate for those exposed to both aircraft and road traffic noise, indicating that exposure to multiple sources of traffic noise may be especially harmful*".

The new noise zones recently incorporated into the Fingal Development Plan are a clear recognition by Fingal County Council that serious adverse health effects occur at exposure levels well below those that are mitigated for in this application. All future properties that lie inside Zones A, B and C require to be thoroughly insulated as outlined by the WHO 2018 Guidelines.

Note that this variation to the Development Plan states that in Zone A "*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*". Under this variation it is acknowledged by Fingal County Council that noise insulation is not a solution within Zone A which covers most of St Margarets The Ward.

The Variation refers to "ProPG Planning and Noise Professional Practice Guidance on planning and noise for new residential developments", dated May 2017 as the guidance for "Good Acoustic Design".

With reference to the ProPG document at Fig 2 it notes that in bedrooms between the hours of 23:00-07:00 that 45dB LAmax should not be exceeded. Footnote 4 states "***in most circumstances in noise sensitive rooms at night (eg bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 dB LAmax more than 10 times per night***".

The St Margarets The Ward Residents have carried out a noise survey of a number of houses recently insulated by the daa under their noise insulation programme. Please refer to noise report from the MLM Group.

As a minimum requirement for an Independent Regulator, independent monitoring should be carried out in the areas closest to the airport. The regulator should not accept only the results from the noise monitoring stations. It should have its own independent analysis carried out to

understand how the populations closest to the airport are being affected. This should also be carried out on dwellings that have been insulated to understand the residual effects of noise post insulation.

The Independent Regulator should also conduct a health survey of the population surrounding the airport. A regulator cannot understand the effects of noise without conducting a health screening. The regulator has not engaged medical expertise on the health effects of noise and is thus not adhering to regulation EU598/2014:

(11) The importance of health aspects needs to be recognised in relation to noise problems, and it is therefore important that those aspects be taken into consideration in a consistent manner at all airports when a decision is taken on noise abatement objectives, taking into account the existence of common Union rules in this area. Therefore, health aspects should be assessed in accordance with Union legislation on the evaluation of noise effects.

In addition, competent authorities may take due account of the following factors:

(1) the health and safety of local residents living in the vicinity of the airport;

16.4 HEALTH BURDEN

In 2016 the EU carried out a review and evaluation of the Environmental Noise Directive titled "Evaluation of Directive 2002/49/EC Relating to the Assessment and Management of Environmental Noise" (https://op.europa.eu/en/publication-detail/-/publication/7febde6d-9a89-11e6-9bca-01aa75ed71a1).

"*A cost-benefit analysis (CBA) was conducted to quantify (in monetary terms) the cost-effectiveness of the END. The benefits are mainly gained by the population affected by excessive noise. It was not possible to quantify some of the strategic benefits of the END, such as its role in stimulating awareness of noise as an issue, facilitating the generation of large and consistent spatial datasets on noise exposure and supporting actions in other areas (e.g. development of technical standards). The CBA is therefore based primarily on an assessment of the contribution made by measures identified in R1 NAPs to reducing exposure to harmful levels of noise.*

The analysis revealed that the END has made a positive contribution to reducing population exposure to high levels of environmental noise. Whilst the magnitude of costs and benefits of noise mitigation measures was found to vary between countries and sources, a positive cost-benefit relationship was identified under a range of scenarios, where the scenarios reflect both differences in the underlying assumptions regarding the extent to which costs and benefits can be attributed to the END and the range of uncertainty in relation to the value of impacts on human health. ***The base case scenario results in a favourable cost-benefit ratio (of 1:29) overall****, although the ratios vary substantially between measures. The benefits are likely to be understated, since the analysis only considered the effects of noise reduction on the '****highly annoyed****' and '****highly sleep disturbed****' populations. It should be noted that whilst the CBA is an important element of assessing efficiency, measure-level data only provides a proxy, since NAP measure implementation is not compulsory and does not take into account the strategic, qualitative benefits of the END (see impacts under "effectiveness").*"

The review references the 'EEA's 2014 Noise in Europe Report' report that outlines that the population exposure due to environmental noise is a major health problem in Europe which "*causes at least 10000 cases of premature death in Europe each year, with almost 20 million adults annoyed and a further 8 million suffering from sleep disturbance due to environmental noise*". It also notes that noise pollution causes 43000 hospital admissions in Europe per year.

The 7th Environment Action Programme (7th EAP) provides an overarching policy framework for European environment policy until 2020 and sets out a long-term vision for 2050.

Priority Objective 3 addresses challenges to 'human health and wellbeing', such as air and water pollution and excessive noise.

Priority Objective 8 – 'Sustainable Cities' notes that "Europe is densely populated and 80 % of its citizens are likely to live in or near a city by 2020. Cities often share a common set of problems such as [inter alia] poor air quality and high levels of noise".

In order to safeguard the Union's citizens from environment-related pressures and risks to health and well-being, the **7th EAP aims to ensure that by 2020 noise pollution in the Union has significantly decreased, moving closer to the WHO recommended levels**. It notes that this implies "implementing an updated Union noise policy aligned with the latest scientific knowledge, and measures to reduce noise at source, including improvements in city design".

It is very clear from the Noise Action Plans and the increase in noise levels at Dublin Airport, that Ireland has failed in relation to the 7th EAP.

On the 12th of May 2021, the EU Commission adopted the EU Action Plan "Towards a zero pollution for air, water and soil".

Target 2 of this Action Plan is "by 2030 the EU should reduce by 30% the share of people chronically disturbed by transport noise". This 30% reduction is from the reference year 2017 and is based on the EU study (2021) "Assessment of Potential Health Benefits of Noise Abatement Measures in the EU".

At section 2.25 of the ANCA SEA draft environmental report by Noise Consultants it clearly states that "in the case of the European Commission's Zero Pollution Action Plan (2021), this overarching EU policy sets clear targets with respect to reducing the number of people chronically disturbed by transport noise. As part of this action plan target 2 states that "by 2030 the EU should reduce by 30% the share of people chronically disturbed by transport noise [from a 2017 baseline]"""".

Yet ANCA have set the baseline at 2019 figures which was the busiest and noisiest year in the history of Dublin Airport, despite the fact that their own SEA documentation above clearly states 2017 as the baseline year.

This must be reported to the Irish Government as a total breach of Ireland to meet the adopted action plan by Europe. The daa are also in breach of the EU requirements as they adopted 2018 as the baseline year despite the escalation of noise over successive noise action plans as indicated below. This is a blatant attempt to disregard the protection of health of the St Margarets The Ward community over commercial considerations despite the EU's regulations and requirements to reduce harmful noise by 30% from 2017-2030.

In section 1.3.2, the EU review references the WHO 2011 publication on the 'Burden of Disease from environmental noise through the quantification of healthy life years lost in Europe' (http://www.euro.who.int/__data/assets/pdf_file/0008/136466/e94888.pdf). According to the WHO, a Disability-Adjusted Life Years (DALY) represents one lost year of "healthy" life. "The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability"

The review in its cost benefit analysis using the value of a VOLY (value of life year lost) for a DALY. It used a value of **110,987** euro, derived from the cost benefit analysis of the Air Quality Package for Europe (https://ec.europa.eu/environment/air/pdf/TSAP%20CBA.pdf), adjusted to 2014 prices using the Eurostat GDP deflator.

The EEA produced a report in 2020 (https://www.eea.europa.eu/publications/environmental-noise-in-europe) on the Health Impact Assessment of noise.

In Section 3.4 of this EEA report, it discusses the Burden of Disease of noise in terms of DALYs/year and DALYs/year/million (Table 3.6). It only looks at noise >55dB Lden and >50dB Lnight. It states that this is an underestimate as the END didn't specify lower levels. Roughly 1 million healthy years of life are lost every year.

"*The associated decline in the population's health because of noise has an economic impact in Europe. There are different approaches for quantifying the economic costs of noise on health, one of which relies on assigning a monetary cost per DALY (Defra, 2014.) Although the assessment of the costs in terms of DALYs may differ from country to country, if we assume that the* ***monetary cost per DALY is EUR 78 500*** *(VITO, 2003), the resulting economic impact of noise is estimated to be* ***EUR 35 billion for annoyance****,* ***EUR 34 billion for sleep disturbance****,* ***EUR 12 billion for IHD and EUR 5 million for cognitive impairment in children****. Monetary costs can also exist as a result of reduced house prices, loss of labour days and reduced possibilities for land use (EC, 2000)."*

In the Defra 2014 report titled 'Environmental Noise: Valuing impacts on: sleep disturbance, annoyance, hypertension, productivity and quiet' (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/380852/environmental-noise-valuing-imapcts-PB14227.pdf), it recommends the use of disability-adjusted life years (DALYs) to reflect the value of impact'.

DALY = Years of life lost (YLL) + Years lived with Disability (YLD)

This analysis focuses solely on years lived with disability (YLD). In the DEFRA 2014 report it assumes that sleep disturbance does not result in premature death and therefore YLL is zero. However, recent scientific evidence suggests that sleep disturbance can cause premature death. For simplicity in this analysis, YLL is assumed zero although this should be investigated further by ANCA.

For Sleep Disturbance, the value is defined by the following formula:

Valuing sleep disturbance

32. The value of sleep disturbance can be calculated. A full description of the method is provided in Annex II. The overall approach to valuing sleep disturbance is provided in the following equation:

> Value of sleep disturbance = population exposed x proportion sleep disturbed x disability weight x health value

This equates to: Total HSD x 0.07 x Value of DALY

The Highly Sleep Disturbed (HSD) population can be calculated using the formulae in Annex III of 2002/49/EC (END) which were inserted by EU Directive 2020/367 (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020L0367).

$$AR_{HSD,air} = \left(16.7885 - 0.9293 * L_{night} + 0.0198 * L_{night}^{\ 2}\right)/_{100} \text{ (Formula 9)}$$

for aircraft noise.

3.3. **For HA and HSD in the case of road, railway and aircraft noise, the total number N of people affected by the harmful effect *y*** (number of attributable cases) due to the source *x*, for each combination of noise source *x* (road, railway or aircraft source) and harmful effect *y* (HA, HSD), is then:

$$N_{x,y} = \sum_j [n_j * AR_{j,x,y}] \text{ (Formula 12)}$$

Where:

— $AR_{x,y}$ is the AR of the relevant harmful effect (HA, HSD), and is calculated using the formulas set out in point 2 of this Annex, calculated at the central value of each noise band (e.g.: depending on availability of data, at 50,5 dB for the noise band defined between 50-51 dB, or 52 dB for the noise band 50-54 dB),

— n_j is the number of people that is exposed to the *j*-th exposure band.

The disability weight for Sleep Disturbance has been assigned by the WHO in their 2018 Guidelines as **0.07**. This means that being highly sleep disturbed due to environmental noise reduces a completely healthy individual's health by around 7%.

The DEFRA 2014 report uses the Department of Health DALY value of Stg 60,000. This estimate would need to be revised upwards in line with inflation.

For Sleep Annoyance, the value is defined by the following formula:

Value of annoyance = population exposed x proportion highly annoyed x disability weight x health value

From Annex III of 2002/49/EC (END):

$$AR_{HA,air} = \left(-50.9693 + 1.0168 * L_{den} + 0.0072 * L_{den}^{2}\right)/100 \quad \text{(Formula 6)}$$

for aircraft noise.

3.3. **For HA and HSD in the case of road, railway and aircraft noise, the total number N of people affected by the harmful effect *y*** (number of attributable cases) due to the source *x*, for each combination of noise source *x* (road, railway or aircraft source) and harmful effect *y* (HA, HSD), is then:

$N_{x,y} = \sum_j [n_j * AR_{j,x,y}]$ (Formula 12)

Where:

— $AR_{x,y}$ is the AR of the relevant harmful effect (HA, HSD), and is calculated using the formulas set out in point 2 of this Annex, calculated at the central value of each noise band (e.g.: depending on availability of data, at 50,5 dB for the noise band defined between 50-51 dB, or 52 dB for the noise band 50-54 dB),

— n_j is the number of people that is exposed to the *j*-th exposure band.

The disability weight for Sleep Annoyance has been assigned by the WHO in their 2018 Guidelines as **0.02**. This means that being highly annoyed due to environmental noise reduces a completely healthy individual's health by around 2%.

The DEFRA 2014 report uses the Department of Health DALY value of Stg 60,000.

The DEFRA report also looks at Hypertension, Productivity losses and Quiet Areas which are not covered in this analysis of the daa's relevant action and ANCA's draft decision. The report estimates that the productivity loss from road traffic noise in England ranges from 2-6 Billion sterling per year.

	%HSD	%HSD plus assuming only 73% in employment
Low	£3,000,000,000	£2,000,000,000
High	£6,000,000,000	£4,000,000,000

ANCA as the independent regulator should also assess productivity losses in Ireland due to aircraft noise.

16.5 DALY CALCULATION

The total number of Highly Sleep Disturbed (HSD) and Highly Annoyed (HA) people for various scenarios are presented by the daa in their reporting template and summarized here:

Scenario	Total HSD
2025 Proposed	37080
2025 Permitted	22500
2018	42260
2019	47045

Scenario	Total HA
2025 Proposed	79405
2025 Permitted	64241
2018	115738
2019	110238

In the EU's 2016 review and evaluation of the Environmental Noise Directive titled "Evaluation of Directive 2002/49/EC Relating to the Assessment and Management of Environmental Noise" (https://op.europa.eu/en/publication-detail/-/publication/7febde6d-9a89-11e6-9bca-01aa75ed71a1), it uses a value of **110987** for a DALY.

Calculations were performed using the 3 different DALY values: €78500 (Vito 2003), €70850 (60k stg, DEFRA 2014)) and €110987 (EU review 2016).

Scenario	Total HSD	DW	Total HSD DALYs	Cost of DALY	Total HSD Cost per year
2025 Proposed	37080	0.07	2596	78500	€203,754,600
2025 Permitted	22500	0.07	1575	78500	€123,637,500
2018	42260	0.07	2958	78500	€232,218,700
2019	47045	0.07	3293	78500	€258,512,275

Scenario	Total HA	DW	Total HA DALYs	Cost of DALY	Total HA Cost per year
2025 Proposed	79405	0.02	1588	78500	€124,665,850
2025 Permitted	64241	0.02	1285	78500	€100,858,370
2018	115738	0.02	2315	78500	€181,708,660
2019	110238	0.02	2205	78500	€173,073,660

Scenario	Total HSD	DW	Total HSD DALYs	Cost of DALY	Total HSD Cost per year
2025 Proposed	37080	0.07	2596	70850	€183,898,260
2025 Permitted	22500	0.07	1575	70850	€111,588,750
2018	42260	0.07	2958	70850	€209,588,470
2019	47045	0.07	3293	70850	€233,319,678

Scenario	Total HA	DW	Total HA DALYs	Cost of DALY	Total HSD Cost per year
2025 Proposed	79405	0.02	1588	70850	€112,516,885
2025 Permitted	64241	0.02	1285	70850	€91,029,497
2018	115738	0.02	2315	70850	€164,000,746
2019	110238	0.02	2205	70850	€156,207,246

Scenario	Total HSD	DW	Total HSD DALYs	Cost of DALY	Total HSD Cost per year
2025Proposed	37080	0.07	2596	110987	€288,077,857
2025Permitted	22500	0.07	1575	110987	€174,804,525
2018	42260	0.07	2958	110987	€328,321,743
2019	47045	0.07	3293	110987	€365,496,839

Scenario	Total HA	DW	Total HA DALYs	Cost of DALY	Total HSD Cost per year
2025Proposed	79405	0.02	1588	110987	€176,258,455
2025Permitted	64241	0.02	1285	110987	€142,598,317
2018	115738	0.02	2315	110987	€256,908,268
2019	110238	0.02	2205	110987	€244,699,698

16.6 SUMMARY OF DIFFERENT DALY VALUES

Scenario	Total Yearly Cost for HA and HSD (Vito 2003)	Total Yearly Cost for HA and HSD (DEFRA 2014)	Total Yearly Cost for HA and HSD (EU 2016)
2025 Proposed	€328,420,450	€296,415,145	€464,336,312
2025 Permitted	€224,495,870	€202,618,247	€317,402,842
2018	€413,927,360	€373,589,216	€585,230,012
2019	€431,585,935	€389,526,924	€610,196,537

EU598/2014 Annex II states that Competent Authorities may take account of health and safety of local residents and environmental sustainability:

ANNEX II

Assessment of the cost-effectiveness of noise-related operating restrictions

The cost-effectiveness of envisaged noise-related operating restrictions will be assessed taking due account of the following elements, to the extent possible, in quantifiable terms:

(1) the anticipated noise benefit of the envisaged measures, now and in the future;

(2) the safety of aviation operations, including third-party risks;

(3) the capacity of the airport;

(4) any effects on the European aviation network.

In addition, competent authorities may take due account of the following factors:

(1) the health and safety of local residents living in the vicinity of the airport;

(2) environmental sustainability, including interdependencies between noise and emissions;

(3) any direct, indirect or catalytic employment and economic effects.

It also lists '*environmental sustainability, including interdependence between noise and emissions*'. The daa have provided no costings on environmental sustainability or

interdependencies between noise and emissions. ANCA, as regulator, should insist on these costings to quantify the environmental burden of its draft decision.

The 'Aircraft Noise Information Reporting Template Guidance' document from ANCA states in section 3.2 Noise Effects Data, that the assessment of costs of noise exposure should include costs of annoyance and costs of health.

The daa have failed to quantify in monetary terms the costs on health of the population exposed to noise as a result of aircraft activity at Dublin Airport. This is a serious omission from the cost effective analysis.

The "Airport Noise Infomration Reporting Template Guidance" document from ANCA states the following at section 3.2:

3.2 Noise Effects Data

Using the noise exposure data, the effects information should be provided:

- Assessment of any significant effects of noise on sensitive receptors;
- Assessment of harmful effects due to long term exposure to noise from airport operations, including:
  - Number of people living in dwellings highly annoyed;
  - Number of people living in dwellings highly sleep disturbed;
  - Sub-totals per Electoral Division
    - Where effects are to be reported per Electoral Division, this should be achieved by prefixing the elements presented in the 'Health' tab to report designators for the Electoral Divisions.
- Assessment of costs of noise exposure, including:
  - Costs of annoyance;
  - Costs of health.

We note that the daa did not submit any of these costs which is a glaring omission as the costs of same are in the order of 610 million euro per year which is alarming.

It is also worth noting that ANCA requested LAmax and SEL data:

daa are invited to provide further, objective measures, using the following or derivations of, for example:

- L_{day};
- $L_{evening}$;
- L_{Amax}; and
- SEL

These were not provided by the daa. Why? Why are ANCA not insisting on the daa to provide the information. We in St Margarets The Ward were awaiting such vital information.

16.7 DAA'S HEALTH EXPERTISE

Following an AIE request to the daa for all documentation and materials compiled by the daa on the health effects of aircraft noise on residents living in the vicinity of an airport, including any medical opinions and reports, any opinions on WHO guidelines and any correspondence or reports provided to senior management, only 4 documents were provided. This decision was appealed to the OCEI Commissioner and below is the feedback from the Commissioner's office.

The daa submits that it hasn't sought medical opinions or reports or even compiled material on the health effects of aircraft noise. How is it possible to do a health impact assessment without this information?

19. DAA does not accept that it is hiding information. DAA submits that it has not commissioned medical opinions and reports on the impact of noise on nearby residents; nor has it compiled any materials on the health effects of aircraft noise, save for the five documents identified as falling within scope. DAA submits that, in common with most other airports in other jurisdictions, DAA does not have in-house competency to undertake research and make generalised assessments or judgments on a specialised environmental and health issue such as the health effects of aircraft noise on nearby residents. Rather, the type of information gathered and used by DAA is, by its nature, publicly available, as DAA relies on public health guidance and research to guide its understanding. DAA submits that its approach is determined primarily by international and national regulations which are predicated on reports by specialists and experts at a European and global level. As a result, DAA relies primarily on published material and associated regulations, which now fall under the Aircraft Noise (Dublin Airport) Regulation Act 2019, implementing Regulation (EU) No 598/2014. DAA submits that, while over time it has collected aircraft noise information, that information has been published either as part of its noise contour maps or as part of the noise complaints information provided to local communities on a regular basis. In any event, such information does not include information on the health effects of aircraft noise on nearby residents, so it does not fall within the scope of your request.

The same question can be asked of ANCA. What Health expertise has ANCA sought on the impacts of aircraft noise? As the Independent Noise Regulator has it sought the advice of the HSE or other Health Authorities in Ireland? Has it commissioned its own medical assessments? How can ANCA adjudicate on Noise when it doesn't have the expertise to understand the health impacts?

However as indicated in the previous sections of this report, the tools to calculate the cost associated with health damage to those affected by airport noise are readily available. Under current legislation it is the responsibility of the Competent Authorities to inform affected citizens of the consequences of the imposition of environmental noise on them and to evaluate the cost associated with the consequences of such noise production.

16.8 UN REPORT

The UN published a report titled 'Frontiers 2022: Noise, Blazes and Mismatches (https://www.unep.org/resources/frontiers-2022-noise-blazes-and-mismatches). It states:

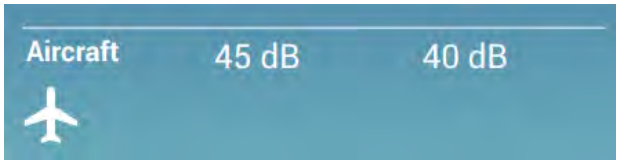
"*Today, noise pollution is a major environmental problem, cited as a top environmental risk to health across all age and social groups and an addition to the public health burden. Prolonged exposure to high levels of noise impairs human health and well-being, which is a growing concern for both the public and policymakers*."

It quotes research from Professor Münzel:

"*Noise-induced awakenings can trigger a range of physiological and psychological stress responses because sleep is necessary for hormonal regulation and cardiovascular functioning. There is increasing evidence that traffic noise exposure is a risk factor for the development of cardiovascular and metabolic disorders such as elevated blood pressure, arterial hypertension, coronary heart disease and diabetes. A conservative estimate indicates that long-term exposure to environmental noise contributes to 48,000 new cases of ischemic heart disease and causes 12,000 premature deaths annually in Europe*."

The report cites the WHO 2018 Guidelines:

"*Scientific evidence used in the WHO review, from studies representing numerous regions on different continents, provides the basis for the recommended exposure thresholds. This comprehensive coverage supports adoption of these thresholds to inform noise control policies around the world*."



17.0 LA_{MAX} SINGLE NOISE EVENTS

17.1 SUMMARY

- No mention of ProPG Guidelines or use of LAmax in application
- LAmax highlighted by WHO Community Noise Guidelines 1999 and WHO Europe Night Noise Guidelines 2009
- LAmax highlighted by BAP pre-planning consultation document of March 2020
- The daa's noise reports for 2020 show how overflying height values recorded at noise monitor 1 (NMT1) are higher than previous years due to low passenger numbers
- Because of higher overflying heights for 2020, LAmax values are artificially lower than would be expected for normal airport activity
- 58% of movements detected at NMT1 had a LAmax > 75 dB, 18% > 78 dB and 2.5% > 81 dB based on data supplied in noise reports for the Jan-June 2020 period
- 68% of movements detected at NMT1 had a LAmax > 75 dB, 26% > 78 dB and 5% > 81 dB based on data supplied in noise reports for the June-Dec 2019 period
- From BAP presentation to CLG in April 2017, average LAmax at NMT1 from Jan-June 2016 was 77 dB
- From BAP presentation to CLG in April 2017, average LAmax at NMT3 from Jan-June 2016 was 72 dB
- From LAmax values supplied by the daa via an AIE request, in July 2019:
    - 1208 Noise events in the night-time period 23:00-07:00
    - Average of 39 movements per night at NMT1
    - Max value of 93.1 dB LAmax
    - Min value of 66.7 dB LAmax
    - Mean value of 76.1 dB LAmax
    - 6.7% of movements > 80 dB LAmax
    - 56.5% between 75-80 dB LAmax
    - 35.3% between 70-75 dB LAmax
    - 1.6% between 65-70 dB LAmax
- For September 2019:
    - 1101 Noise events in the night-time period 23:00-07:00
    - Average of 37 movements per night at NMT1
    - Max value of 106.7 dB LAmax
    - Min value of 66.4 dB LAmax
    - Mean value of 76.1 dB LAmax

  - 12.2% of movements > 80 dB LAmax
  - 52.0% between 75-80 dB LAmax
  - 34.7% between 70-75 dB LAmax
  - 1.2% between 65-70 dB LAmax
- NMT1 is 6.5km from the start of the South Runway and many dwellings are in closer proximity to the airport, subjected to higher LAmax values
- ProPG: - "Indoor sound pressure levels should not exceed approximately **45 dB LAmax more than 10-15 times per night**. This guidance on internal noise levels remains current. Accounting for sleeping with a bedroom window slightly open (and a reduction from outside to inside of 15 dB), this translates to an **outside sound pressure of 60 dB LAmax**".
- '2025 Proposed' equates to 56k people exposed to > 10 N60 Noise events
- 56k people will not be able to sleep with windows slightly open without being sleep disturbed
- '2025 Proposed' scenario has 26% more people (56517 vs 44908) subjected to > 10 N60 noise events compared with '2025 Permitted'.
- Comparing the '2025 Proposed' scenario from the revised EIAR with the '2025 Relevant Action' scenario form the initial EIAR, the population exposed to > 25 N60 events increases from 11739 to 16277, an increase of 38% in the number of people exposed to the number of events exceeding the limit identified by the ProPG and WHO night-time guidelines.
- No consideration by ANCA of the populations exposed to a combined high number of N60 and N65 events, 24 hours a day, without respite.
- EIAR states 'SEL' and 'LAmax' have been presented in the application which is factually incorrect and a serious deficiency of the application
- European Heart Journal December published an editorial on night-time aircraft noise events triggering cardiovascular death
  - Population attributable fraction of 3% of deaths significantly associated with aircraft noise events 2 hours preceding death
  - Editorial suggests that if these findings are confirmed by further studies, then a complete ban on night-time flights must be the consequence and reinforcement of the WHO noise limits
- Fingal County Council and the Health Authorities urgently need to conduct a survey on the populations exposed to noise at Dublin Airport to identify the vulnerable groups and identify risk factors leading to adverse health

The planning noise zones adopted by Fingal County Council in Variation number 1 of the Fingal Development Plan stipulate that planning applications for development in Zones A, B and C must carry out a noise assessment in accordance with the ProPG Planning Guidelines with respect to internal noise levels. The ProPG guidelines make use of LAmax as the key indicator for internal bedroom at night. Individual noise events should not exceed 45 dB LAmax more than 10 times a night. The guidelines also make reference to open windows and

"*where it is proposed that windows need to be closed to achieve the internal noise level guidelines, then full details of the proposed ventilation and thermal comfort arrangements must be provided*".

ACTIVITY	LOCATION	07:00 – 23:00 HRS	23:00 – 07:00 HRS
Resting	Living room	35 dB $L_{Aeq,16\,hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16\,hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16\,hr}$	30 dB $L_{Aeq,8\,hr}$ 45 dB L_{AmaxF} (Note 4)

NOTE 1 The Table provides recommended internal L_{Aeq} target levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources. Ground-borne noise is assessed separately and is not included as part of these targets, as human response to ground-borne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.

NOTE 2 The internal L_{Aeq} target levels shown in the Table are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern, for example on a road serving a port with high levels of traffic at certain times of the night, an appropriate alternative period, e.g. 1 hour, may be used, but the level should be selected to ensure consistency with the internal L_{Aeq} target levels recommended in the Table.

NOTE 3 These internal L_{Aeq} target levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.

NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or L_{AmaxF}, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB L_{AmaxF} more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events (see Appendix A).

In Appendix A.10 the ProPG Guidelines make reference to the UK Government's Planning Practice Guidance and highlights the distinction between detectable impacts and adverse and significant adverse effects of noise on sleep.

- "Noise with the "potential for some reported sleep disturbance" is an "Observed Adverse Effect" that should be mitigated and reduced to a minimum; and

- Noise with the "potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep" is a "Significant Observed Adverse Effect" that should be avoided; and

- Noise that causes "regular sleep deprivation/awakening" is a "Significant Observed Adverse Effect" that should be prevented."

This focus on LAmax is also highlighted in the WHO Community Noise Guidelines 1999. It is therefore imperative that LAmax should be a critical assessment metric in the NAO.

The WHO Community Noise Guidelines 1999 are referenced in the BAP report titled "Dublin Airport Aircraft Noise Methodology Report" dated March 2020 and which was submitted to ANCA as part of their planning application to have the passenger numbers increased from 32m to 35m (F19A/0449).

In appendix A2.33 it states:

"*The 1999 WHO guidelines provide advice that for a good sleep**, indoor sound pressure levels should not exceed approximately 45 dB LAmax more than 10-15 times per night**. This guidance on internal noise levels remains current. Accounting for sleeping with a bedroom window slightly open (and a reduction from outside to inside of 15 dB), this translates to an outside sound pressure level of 60 dB LAmax*."

This is a clear statement from BAP noise consultants that this guidance on LAmax occurrences is still current and valid. This is in direct contrast to ANCA's response in the Consultation Report. In the WHO 2018 Guidelines, it states on page 28 that:

"the current guideline values for the night time are only based on the prevalence of self-reported sleep disturbance and do not take physiological effects into account" and

"*the current guidelines are restricted to long-term health effects during night time and therefore only include recommendations about average noise indicators: Lnight. Nevertheless, the evidence review on noise and sleep (Basner & McGuire, 2018) includes an overview of single-event exposure–effect relationships*".

The results from the 'Basner & McGuire' review consistently indicate that a 10dBA increase in the indoor maximum noise level is associated with an Odds Ratio for awakenings or sleep stage changes to Stage 1 of 1.3 or higher.

Table 13. Summary of findings.

Sleep Outcomes	Noise Source	Number of Participants (Studies)	Quality of Evidence	Noise Metric	Odds Ratio per 10 dBA Increase (95% CI)
Cortical Awakenings in Adults	Road	94 (2)	⊕⊕⊕O Moderate There was evidence of dose-response	Indoor $L_{AS,max}$	1.36 (1.19–1.55)
	Rail	33 (1)	⊕⊕⊕O Moderate There was evidence of dose-response	Indoor $L_{AS,max}$	1.35 (1.21–1.52)
	Aircraft	61 (1)	⊕⊕⊕O Moderate There was evidence of dose-response	Indoor $L_{AS,max}$	1.35 (1.22–1.50)
Self-Reported Sleep Disturbance in Adults (Noise Source Specified)	Road	20,120 (12)	⊕⊕⊕O Moderate There was evidence of dose-response	Outdoor L_{night}	2.13 (1.82–2.48)
	Rail	7133 (5)	⊕⊕⊕O Moderate There was evidence of dose-response	Outdoor L_{night}	3.06 (2.38–3.93)
	Aircraft	6371 (6)	⊕⊕⊕O Moderate There was evidence of dose-response	Outdoor L_{night}	1.94 (1.61–2.33)

The WHO 2018 Guidelines state on page 75 that:

"*There is additional uncertainty when characterizing exposure using the acoustical description of aircraft noise by means of Lden or Lnight. Use of these average noise indicators may limit the ability to observe associations between exposure to aircraft noise and some health outcomes (such as awakening reactions); as such, noise indicators based on the number of events (such as the frequency distribution of LA,max) may be better suited*."

The BAP report goes on further to explain how N60 contours can be used to show differences in scenarios for individual noise events:

"*N60 contours are therefore used in this assessment to illustrate how, for a given point on the ground, the number of aircraft events producing a level of 60 dB LAmax or more will change between various scenarios.*"

The WHO 2009 Night Noise Guidelines (NNG) make reference to the Community Nosie Guidelines (1999):

"*If negative effects on sleep are to be avoided the equivalent sound pressure level should not exceed 30 dBA indoors for continuous noise. If the noise is not continuous, sleep disturbance correlates best with LAmax and effects have been observed at 45 dB or less. This is particularly*

true if the background level is low. Noise events exceeding 45 dBA should therefore be limited if possible. For sensitive people an even lower limit would be preferred. It should be noted that it should be possible to sleep with a bedroom window slightly open (a reduction from outside to inside of 15 dB). To prevent sleep disturbances, one should thus consider the equivalent sound pressure level and the number and level of sound events. Mitigation targeted to the first part of the night is believed to be effective for the ability to fall asleep."

The NNG comments further:

"*New information has made more precise assessment of exposure-effect relationship. The thresholds are now known to be lower than LAmax of 45 dB for a number of effects. The last three sentences still stand: there are good reasons for people to sleep with their windows open, and to prevent sleep disturbances one should consider the equivalent sound pressure level and the number of sound events. The present guidelines allow responsible authorities and stakeholders to do this. Viewed in this way, the night noise guidelines for Europe are complementary to the 1999 guidelines. This means that the recommendations on government policy framework on noise management elaborated in the 1999 guidelines should be considered valid and relevant for the Member States to achieve the guideline values of this document*."

The executive summary makes reference to the interim target (IT) of 55 dB Lnight,outside and for its recommendation in the situations where the NNG of 40 dB Lnight, outside is not achievable in the short term. But the "***IT is not a health-based limit by itself. Vulnerable groups cannot be protected at this level***".

The 2009 NNG makes reference to a comparison of 'Inside' to 'Outside'. The assumption is that the insulation value of a house is 30 dB with windows closed and 15 dB with windows open. With windows open 50% of the time then the value is 18 dB. The guidelines present a figure of 21 dB as a conversion factor between outside and inside and this takes account that even well insulated houses may have their windows open a large part of the year.

Another very important feature of night-time noise events is the difference between the background noise levels and these single events. Background noise levels are lower at night and therefore harder to mask the individual aircraft noise events. The environs of the flight paths to the West of Dublin Airport is rural, lending itself to quiet night-time ambient noise levels and therefore the changes from ambient to high aircraft noise levels is of high significance.

17.2 NOISE REPORTS

The DAA provide biannual noise monitoring reports and publish them on their website (https://www.dublinairport.com/corporate/sustainability-and-community/noise/airport-noise-noise-reports).

The January-June 2020 report shows a significant decrease in aircraft movements from March to June due to the Covid-19 pandemic. Table 4 provides overflying altitudes at the various noise monitoring terminals (NMTs) comparing with the same period in 2019:

Table 4: Average overflying height

	Height [ft]									
	NMT1		NMT2		NMT5		NMT6		NMT20	
	A	D	A	D	A	D	A	D	A	D
2019	900	2,600	1,100	2,600	1,100	2,800	1,200	2,800	1,500	3,400
2020	1,000	2,800	1,000	3,000	1,100	3,000	1,300	3,200	1,600	3,600

NMT1 monitors runway 28 departures and runway 10 arrivals. It's located at the 'Bay Lane' and is approximately 6.5km from the start of the runway.

Table 4 shows that arrivals were on average 100 ft higher at NMT1 and departures 200 ft higher. This can be explained by lighter load factors due to the loss of passengers during the Covid-19 pandemic.

The July-December 2019 report shows the average overflying height compared with the same period in 2018:

Table 4: Average overflying height

	Height [ft]													
	NMT1		NMT2		NMT3		NMT4		NMT5		NMT6		NMT20	
	A	D	A	D	A	D	A	D	A	D	A	D	A	D
2018	900	2,600	1,000	2,600	900	2,500	1,100	2,900	1,100	2,700	1,200	3,100	1,500	3,400
2019	1,000	2,500	1,000	2,600	1,000	2,500	1,100	2,800	1,100	2,700	1,200	3,100	1,500	3,400

And the January to June 2019 report compares the same period with 2018:

Table 4: Average overflying height

	Height [ft]									
	NMT1		NMT2		NMT5		NMT6		NMT20	
	A	D	A	D	A	D	A	D	A	D
2018	900	2,600	1,000	2,600	1,100	2,800	1,100	3,100	1,500	3,400
2019	900	2,600	1,000	2,600	1,100	2,800	1,200	2,800	1,500	3,400

Using these average overflying heights, the data shows that arrivals normally overfly NMT1 at 900ft and departures at 2600ft. The data in the first half of 2020 shows that these heights have increased but that can be explained by the lower loads due to lower passenger numbers. The report states that in the first half of 2020 there was a decrease of 65% in passenger numbers compared to the same period in 2019. And Runway 28 handled 88% of all the movements in this period.

The report provides the LAmax distribution for NMT1 in figure 12:

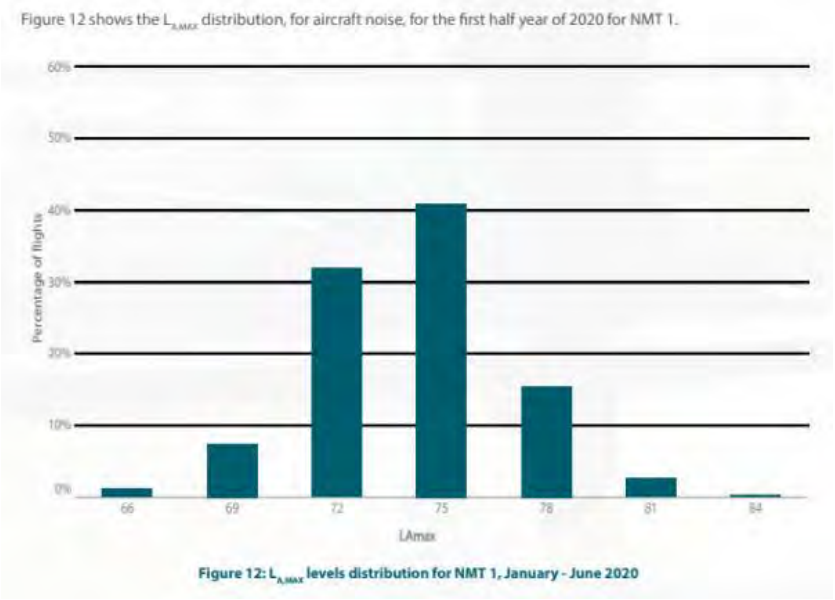
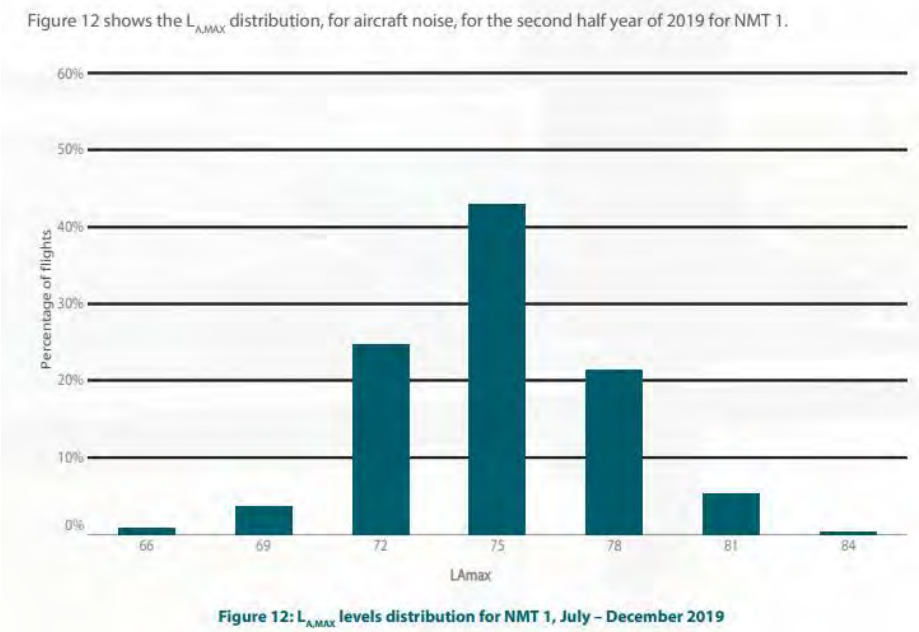


Figure 12 shows that approximately 58% of aircraft movements detected at NMT1 had a LAmax value > 75 dB. Approximately 18% had a LAmax value > 78 dB and 2.5% > 81 dB.

From the distribution of the LAmax values for the June-Dec 2019 time period, the percentage of events > 75 dB LAmax is approximately 68%. 26% > 78 dB LAmax and 5% > 81 dB LAmax.



The distribution for the first half of 2019 is similar. From these distributions and the lower heights of overflying aircraft one can deduce that the distribution for 2020 shows lower amount of LAmax events > 75 dB, which is below normal expected noise levels.

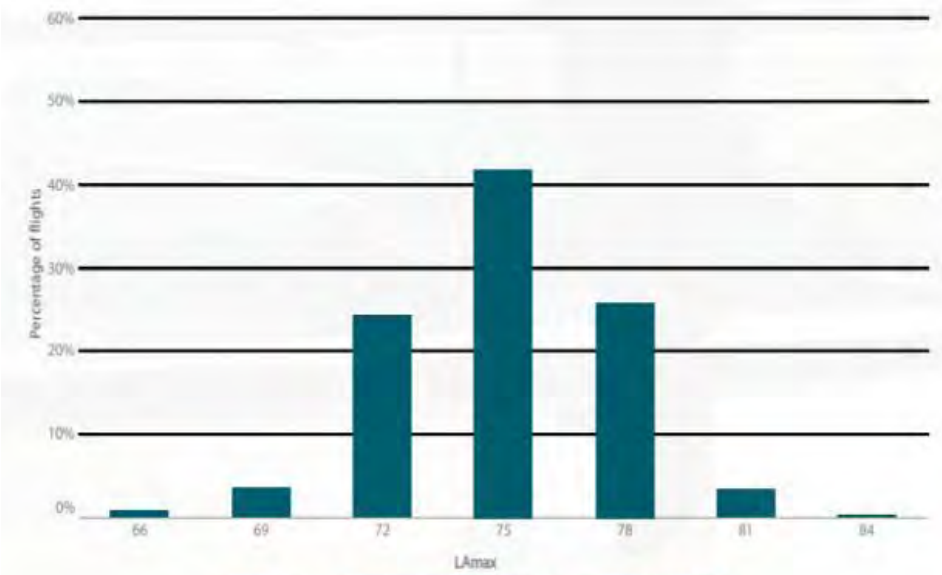


Figure 12: $L_{A,MAX}$ levels distribution for NMT 1, January – June 2019. Updated in September 2020 (see section introduction and executive summary).

17.3 BAP PRESENTATION

At a Community Liaison Group (CLG) meeting in April 2017, a presentation from BAP was given titled 'Aircraft Noise Monitoring Data from Noise Monitoring Terminals (NMTs)'. In this presentation BAP explain noise monitoring and metrics. The presentation also focused on NMT1 and NMT3 which are to the West of Dublin Airport.

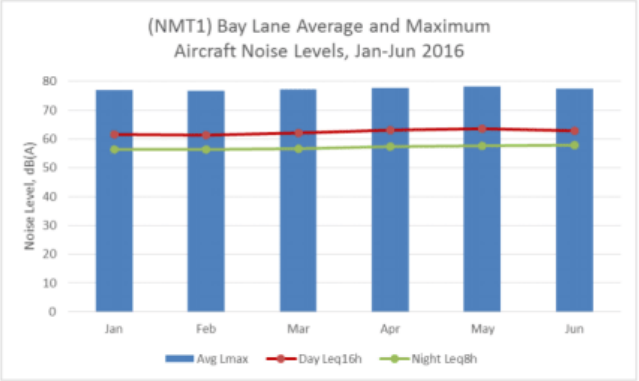
NFTMS NMT1 Bay Lane – Details

NFTMS NMT3 Bishopswood – Details

Average LAmax at NMT1 from January-June 2016 was 77 dB:

Bickerdike Allen Partners
Architecture Acoustics Technology

NFTMS Average & Maximum Noise Levels



Average L_{eq} for 6-month period
Day 62.5 dB
Night 57.1 dB

Based on 42,566 aircraft noise events

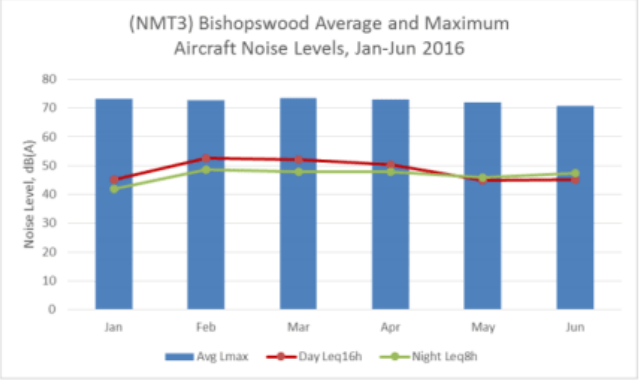
Avg L_{max} is the average of the maximum levels of all aircraft events recorded at the NMT in the month.

Average L_{max} for 6-month period is 77 dB
Day L_{eq} 5 dB higher than night on average

Average LAmax at NMT3 from January-June 2016 was 72 dB:

Bickerdike Allen Partners
Architecture Acoustics Technology

NFTMS Average & Maximum Noise Levels



Average L_{eq} for 6-month period
Day 49.6 dB
Night 47.0 dB

Based on 4,122 aircraft noise events

Avg L_{max} is the average of the maximum levels of all aircraft events recorded at the NMT in the month.

Average L_{max} for 6-month period is 72 dB
Day L_{eq} 3 dB higher than night on average

An important point to note is that there are many dwellings that are located closer to Dublin Airport than NMT1 which is 6.5km from the start of the South Runway. These dwellings are exposed to noise levels in excess of those at NMT1 as the aircraft are lower on departure and arrival, closer to the airport.

LAmax values for 2019 were requested via an AIE request to the DAA on August 12th 2020 and the DAA responded with an Excel sheet on September 9th.

Data for July and September for NMT1 was analysed and the following statistics produced:

- July
  - 1208 Noise events in the night-time period 23:00-07:00
  - Average of 39 movements per night at NMT1
  - Max value of 93.1 dB LAmax
  - Min value of 66.7 dB LAmax
  - Mean value of 76.1 dB LAmax
  - 6.7% of movements > 80 dB LAmax
  - 56.5% between 75-80 dB LAmax
  - 35.3% between 70-75 dB LAmax
  - 1.6% between 65-70 dB LAmax
- September
  - 1101 Noise events in the night-time period 23:00-07:00
  - Average of 37 movements per night at NMT1
  - Max value of 106.7 dB LAmax
  - Min value of 66.4 dB LAmax
  - Mean value of 76.1 dB LAmax
  - 12.2% of movements > 80 dB LAmax
  - 52.0% between 75-80 dB LAmax
  - 34.7% between 70-75 dB LAmax
  - 1.2% between 65-70 dB LAmax

The data shows that during July and September 2019, over 37 movements were detected at NMT1 over the night-time period and over 63% of these movements were recorded at a value greater than 75 dB LAmax, at a distance 6.5km from the start of the runway.

In the ProPG guidelines, appendix A2.33 states:

> "*The 1999 WHO guidelines provide advice that for a good sleep**, indoor sound pressure levels should not exceed approximately 45 dB LAmax more than 10-15 times per night**. This guidance on internal noise levels remains current. Accounting for sleeping*

with a bedroom window slightly open (and a reduction from outside to inside of 15 dB), this translates to an ***outside sound pressure level of 60 dB LAmax***".

In table 13C-56 of the EIAR appendices, the existing population counts for the N60 metric are given. N60 is the number of events above 60dB LAmax per night-time period.

Table 13C-56: Existing Population Counts, N60 Metric

Metric Value, N60	Scenario and Existing Population Count						
	2018	2022 Permitted	2022 Proposed	2025 Permitted	2025 Proposed	2035 Permitted	2035 Proposed
≥ 10	69,613	41,432	46,401	44,908	56,517	27,353	29,801
≥ 25	24,638	296	8,820	15,333	16,277	12,452	12,981
≥ 50	80	0	67	16	110	16	98
≥ 100	0	0	0	0	0	0	0

The '2025 Proposed' scenario has 26% more people (56517 vs 44908) subjected to > 10 N60 noise events compared with '2025 Permitted'.

Based on the ProPG Guidelines, 56517 people will not be able to sleep with their windows slightly open or risk having their sleep disturbed, with the '2025 Proposed' Scenario.

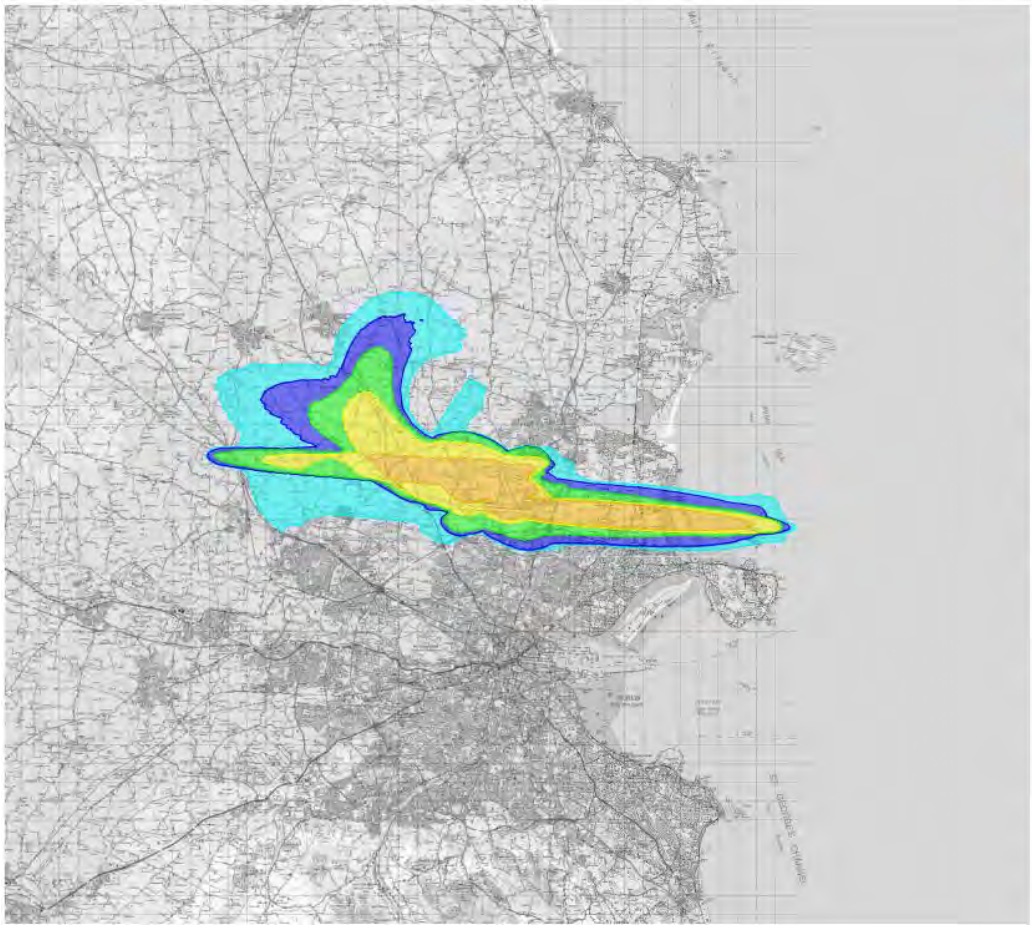
Comparing the '2025 Proposed' scenario from the revised EIAR with the '2025 Relevant Action' from the initial EIAR, one can see that although the population exposed to > 10 N60 events reduces from 61018 to 56517, the population exposed to > 25 N60 events increases from 11739 to 16277, an increase of 38% in the number of people exposed to the number of events exceeding the limit identified by the ProPG and WHO night-time guidelines.

Table 13C-40: Existing Population Counts, N60 Metric

Metric Value N60	Scenario and Existing Population Count						
	2018 Baseline	2019 Baseline	2022 Baseline	2022 Relevant Action	2025 Baseline	2025 Consented	2025 Relevant Action
≥ 10	69,613	75,967	42,926	59,891	42,864	65,906	61,018
≥ 25	24,638	26,835	15,370	11,879	15,020	7,958	11,739
≥ 50	80	7,402	35	67	32	29	191
≥ 100	0	0	0	0	0	0	0

This increase in harmful exposure has not been explained by the daa and not addressed by ANCA in their Regulatory Decision and Consultation Report. ANCA should have considered the initial '2025 Relevant Action' as an alternative scenario in their analysis but failed to do so.

Another area that ANCA failed to address in their Regulatory Decision and Consultation Report is the combined effects of both excessive daytime and night-time exposures. When looking at the N65 Noise Contours, one can see a large overlap in the St Margarets The Ward and Portmarnock areas with the N60 Noise Contours. These populations are expected to endure > 25 N60 night-time events and > 200 N65 daytime events. There is no respite for these areas and ANCA have failed in their Regulatory Decision and Consultation Report to address this harmful 24 hour exposure and provided no respite which is common at other major airports.


CYAL50218188
© Ordnance Survey Ireland/Government of Ireland.
LEGEND:
10 - 24 N65
25 - 49 N65
50 - 99 N65
100 - 199 N65
200 - 499 N65
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Rev Date Description Initials
REVISIONS
Bickerdike
Allen
Partners
Architecture
Acoustics
Technology
Dublin Airport
Change to Permitted Runway Operations
Forecast N65 Noise Contours
2025 Proposed Scenario
Figure 13C-37
DRAWN: MP
CHECKED: DC
DATE: July 2021
SCALE: 1:250000@A4
Drawing No:
A11267_19_DR726_2.0

In section 13.3.12 of the EIAR (Supplementary Noise Metrics), it lists 'SEL' and 'LAmax' as metrics that have been presented in this application.

Supplementary Noise Metrics

13.3.10 The primary air noise assessment metrics generally rely on extensive surveying of attitudes to aircraft noise resulting in a dose-response relationship linking levels of community annoyance to the metric. In addition, as used previously in the assessment of air noise around Dublin Airport, noise contours have been prepared in terms of the established UK noise metrics for air noise, the $L_{Aeq,16h}$ metric for the daytime (07:00-23:00) period and the $L_{Aeq,8h}$ metric for the night-time (23:00-07:00) period. These periods relate to an average summer day. Summer in this instance is defined as the 92-day period between 16 June and 15 September inclusive.

13.3.11 Some other supplementary air noise metrics, while having limited research into correlation with community annoyance, can be useful in reflecting how aircraft noise is experienced in the locality around an airport and these are also presented here.

13.3.12 The following supplementary noise metrics have been presented to contextualise the noise around Dublin Airport associated with the proposed Relevant Action:

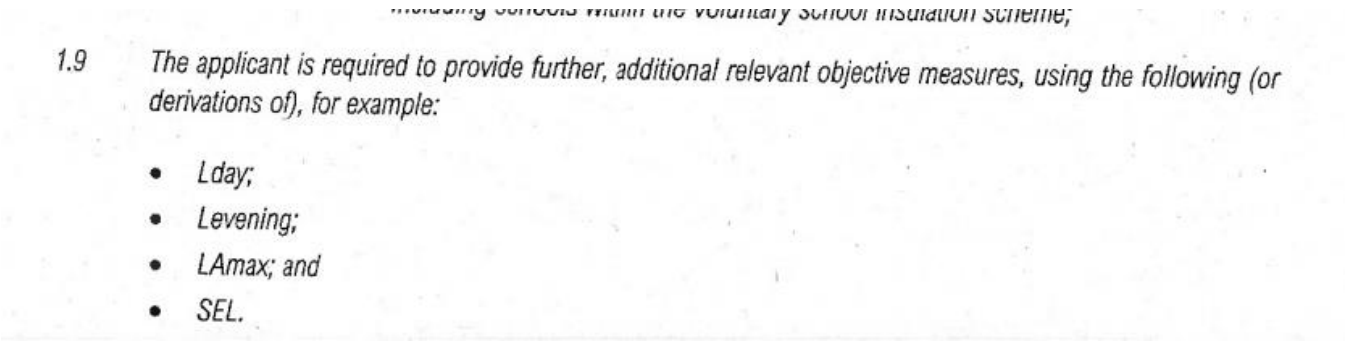
- The summer $L_{Aeq,16h}$ and $L_{Aeq,8h}$ metrics. These describe the average noise level during a summer day (07:00-23:00) and summer night (23:00-07:00) respectively. They were used for the application

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 day (07:00-19:00) and evening (19:00-23:00) respectively. They provide information on the variation in noise across the day and evening;
- N65 and N60 indices. N65 for example indicates the number of times a threshold level of 65 dB L_{Amax} is exceeded within the time period of interest and has been determined for the summer daytime period. The N60 has been determined for the summer night-time period. These metrics are included as they are considered to aid public understanding by providing distributions of noise events;
- Single mode contours for the L_{night} and N60 indices. These are used to illustrate the noise on a night when aircraft operate all in the same direction. This differs from the standard contours which reflect the average use of the runways over the long-term, typically a year;
- L_{Amax}, which can be used to rate the impacts of noise from individual aircraft operations at night; and
- Hourly noise levels during the night at representative residential receptors shown in Plate 13.4 and listed in Table 13-10, to give an indication of how these will change due to the proposed Relevant Action.

This is factually incorrect as no discussion on SEL or LAmax values are presented. This is a serious deficiency in any noise application. SEL and LAmax values should be important noise metrics requested by ANCA.

It is interesting to note that ANCA requested SEL and LAmax data from the daa in their additional information request (anca-rf01.pdf) during the 32 to 35m passenger planning application (F19A/0449).

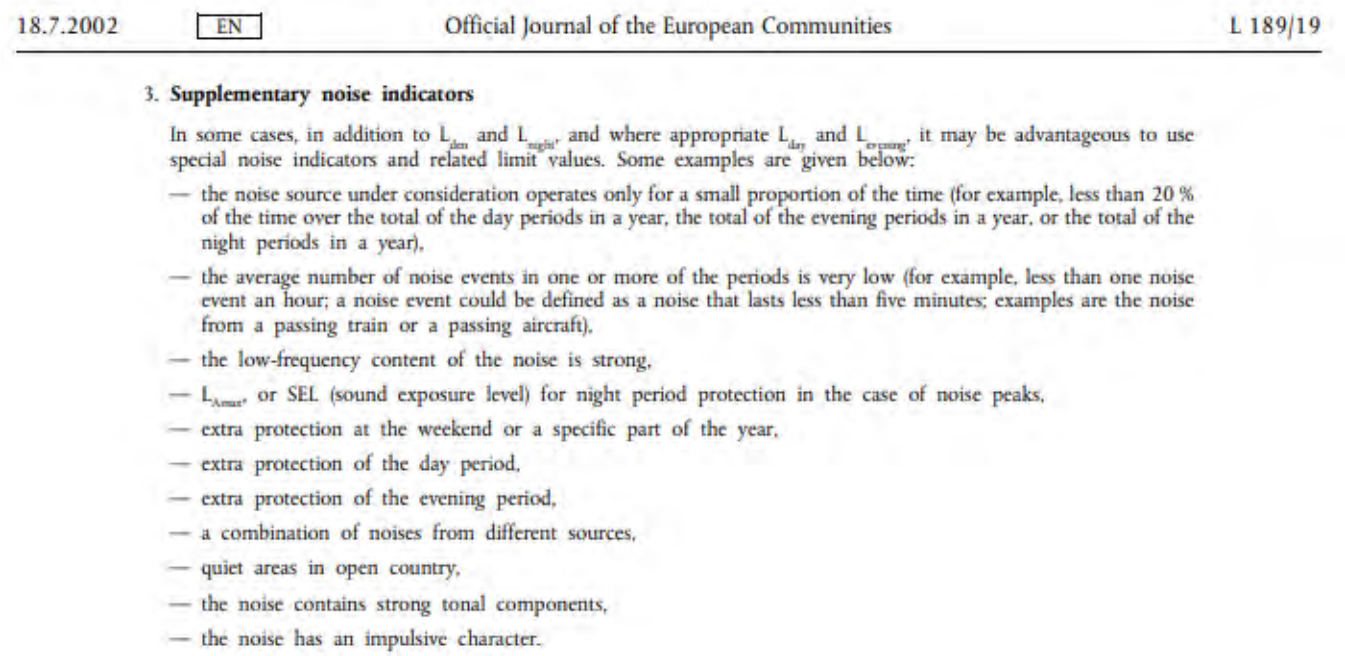


including schools within the voluntary school insulation scheme;

1.9 *The applicant is required to provide further, additional relevant objective measures, using the following (or derivations of), for example:*

- *Lday;*
- *Levening;*
- *LAmax; and*
- *SEL.*

In Annex I of Directive 2002/49/EC (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32002L0049&from=EN) it lists both LAmax and SEL as supplementary noise indicators, which have been dismissed by ANCA in their Regulatory Decision and Consultation Report without due consideration.



18.7.2002 EN Official Journal of the European Communities L 189/19

3. Supplementary noise indicators

In some cases, in addition to L_{den} and L_{night}, and where appropriate L_{day} and $L_{evening}$, it may be advantageous to use special noise indicators and related limit values. Some examples are given below:

— the noise source under consideration operates only for a small proportion of the time (for example, less than 20 % of the time over the total of the day periods in a year, the total of the evening periods in a year, or the total of the night periods in a year),

— the average number of noise events in one or more of the periods is very low (for example, less than one noise event an hour; a noise event could be defined as a noise that lasts less than five minutes; examples are the noise from a passing train or a passing aircraft),

— the low-frequency content of the noise is strong,

— L_{Amax}, or SEL (sound exposure level) for night period protection in the case of noise peaks,

— extra protection at the weekend or a specific part of the year,

— extra protection of the day period,

— extra protection of the evening period,

— a combination of noises from different sources,

— quiet areas in open country,

— the noise contains strong tonal components,

— the noise has an impulsive character.

ANCA's response to single event noise indicators such as SEL and LAmax has been simply to dismiss their us and attempted to base their rebuttal citing remarks in the WHO 2018 Guidelines:

Consultation Report – Pages 21 & 29

There is research which has used alternative metrics to describe the potential impacts of aircraft noise events on sleep, such as indoor and outdoor L_{Amax} levels, their distribution and occurrence. Whilst recognising that such metrics can be used to describe effects such as awakenings and physiological reaction, ENG18 states that: *"the relationship between different types of single-event noise indicators and long-term health outcomes at the population level remains tentative"*. As such the ENG18 made no recommendations for single-event noise indicators.

The regulatory framework under which ANCA is required to carry out its assessments specifies the use of annual-averaged noise exposure metrics. These take into account the level of individual aircraft noise events, such as those reported in a submitted 2018 'longitudinal analysis' along with the frequency of their occurrence. The objective of the regulatory framework is to limit and reduce the harmful effect of environmental noise. This relies on dose-response relationships taken from the ENG18. ENG18 considered single-event noise indicators, such as Sound Exposure Level (SEL) and L_{Amax}, however only found tentative evidence associated with these and long-term health outcomes.

A review of night-time transportation noise and the WHO 2018 Guidelines was carried out by Münzel et al in 2020 – "*Adverse Cardiovascular Effects of Traffic Noise with a Focus on Nighttime Noise and the New WHO Noise Guidelines*" (https://www.annualreviews.org/doi/abs/10.1146/annurev-publhealth-081519-062400).

This review states that:

"*The 2018 WHO report focused on the effects of LDEN (24 h noise) in their evaluation of cardiometabolic disease, so in this review we summarize the current knowledge of the pathway from exposure to nighttime noise to cardiovascular and metabolic disease, identify research gaps, and present mitigation measures*."

The review states that:

"*The focus of the WHO report was to evaluate the effects of exposure to transportation noise over the whole day, estimated as Lden. The WHO evaluated the effects of nighttime noise previously in 2009. However, since 2009, a number of mechanistic studies have investigated the effects of nocturnal noise, indicating that it may be a particularly crucial time window, as exposure to noise during nighttime disturbs and stresses the body during sleep, thereby increasing a number of cardiovascular risk factors (44, 54, 80, 81).*"

The review then summarises the current knowledge of the cardiovascular effects of nighttime noise.

"*The WHO recently evaluated the effects of transportation noise on measured and self-reported sleep (3). A meta-analysis of psychoacoustic surveys on self-reported sleep disturbance (percent highly disturbed) showed statistically significant odds ratios of 1.9 for aircraft, 2.1 for road, and 3.1 for rail per 10 dB(A) increase in noise when questions referred to the effects of noise on sleep (3). However, in studies where the sleep questions did not refer to specific noise sources but to general sleep indicators, such as problems with falling asleep and awakenings, associations with traffic noise were less pronounced.*

Furthermore, as part of the WHO review, a combined analysis was conducted of two existing studies examining acute effects of traffic noise events on sleep physiology measured by polysomnography (5, 22). This event-related analysis showed that a 10 dB(A) increase in indoor maximum noise from road, rail, or aircraft was significantly associated with awakenings or sleep stage changes (from deeper sleep stages to wake or stage 1) with odds ratios of 1.35 (3). Based on this analysis, the WHO strongly recommended to decrease nighttime noise (Lnight) for road traffic noise below 45 dB(A), for railway noise below 44 dB(A), and for aircraft noise below 40 dB(A) to prevent effects on sleep (103).

A 2018 study (73), published after the WHO review, with young (19–33 years) and older (52–70 years) volunteers confirmed effects from nighttime transportation noise events on increased sleep electroencephalography (EEG) arousal indices, although sleep structure and continuity were not affected [Leq was 45 dB; maximum event levels were 50–62 dB(A)] (73). Amplitude of sleep spindles, which are known to have a sleep-protective function (100) and to be relevant for memory consolidation (2), was consistently decreased during noise compared with noise-free nights in both age groups.

Which time window during sleep is most critical is still unclear, although such knowledge is important for efficient noise control. A study of 12 women and 12 men who slept for 2 weeks in a sleep laboratory applied 3 different noise scenarios with noise curfews at different times during the night (11 PM–3 AM, 11 PM–5 AM, 3 AM–7 AM) and analyzed the polysomnograms (33). Investigators found that noise in the beginning of the night impaired the process of falling asleep. However, sleep disturbances experienced in the beginning of the night were compensated later if nighttime curfews were in place. In contrast, even short periods of noise toward the end of the sleeping period were observed to cause sleep disturbances. In line with this finding, several observational studies on transportation noise indicate that noise exposure has the strongest effect on self-reported sleep quality in the morning, when the sleep pressure is lowest. In a Norwegian study of 13,019 participants (24) and a Swiss study of 1,375

participants (29), modeled nighttime traffic noise exposure was associated primarily with self-reported early awakenings, whereas associations with other sleep-quality parameters such as awakening during the night or difficulty falling asleep were less pronounced. Also, psychoacoustic surveys observed that noise exposure occurring during the early part of the night and during the time just preceding usual awakening were reported to be most annoying (63). Strikingly, a panel study of 40 individuals found that noise exposure during work had sustained effects on nighttime sleep quality, suggesting that daytime noise may also be relevant for sleep (57).”

The review then looks at night-time noise and risk for cardiovascular disease (CVD):

“*Although exposure to transportation noise is known to disturb sleep duration and quality, epidemiological studies comparing the effects of daytime and nighttime transportation noise are necessaryto improve our understanding of which exposure time window is most harmful.*

Separating long-term effects of daytime and nighttime noise exposure in epidemiological studies are challenging. Exposure misclassification for daytime noise is higher than for nighttime noise because large-scale epidemiological studies are based on residential exposure, which may not reflect personal exposure during the day, when people are likely not to be at home. Also, daytime and nighttime exposure levels are often highly correlated. This finding is especially evident for road traffic noise where input data on traffic are based on traffic count samples, which are then extrapolated over the whole day, resulting in correlations between daytime and nighttime noise close to 1 (36, 42, 89). In reality, correlation between road traffic noise at different time intervals is expected to be lower (71).

A Spanish cross-sectional study overcame this correlation dilemma by calculating three different estimates for residential traffic noise for their population of ≈2,000 persons: noise at the most exposed façade; noise at the bedroom façade; and “indoor bedroom noise” where information on insulation, type of window, and window-opening habits was included (28). They found a significant association with a higher systolic blood pressure only for indoor bedroom noise, suggesting that nighttime noise affects the blood pressure. However, they also found noise at the most exposed façade to be more strongly associated with hypertension than was indoor bedroom noise, suggesting that exposure during the day and evening can also be harmful.

For aircraft and railway noise, correlations between daytime and nighttime noise are lower than for road traffic noise. The Hypertension and Exposure to Noise Near Airports (HYENA) study of ≈5,000 persons living near one of six major European airports investigated effects of nighttime aircraft noise (20, 39, 40, 49). In this study, correlation between daytime

and nighttime aircraft noise was 0.8 and a significant association between nighttime aircraft noise and prevalent hypertension was found, whereas no association was seen for daytime aircraft noise (Figure 1c) (49). A follow-up study of the Greek population of the HYENA study later supported this finding in a longitudinal design: The data showed a significant association between nighttime aircraft noise and incident hypertension, whereas associations with daytime aircraft noise were weaker and insignificant (20).Within the framework of the HYENA study, 140 participants were selected for a field study with continuous measurements of noise and blood pressure during sleep at home (40). The study found a 6-mm Hg increase in systolic and a 7-mm Hg increase in diastolic blood pressure if an aircraft event of >35 dB(A) had occurred within the last 15 minutes. Results of similar size were observed for road traffic noise. This association was independent of the sequence of noise measurements, indicating that there is no habituation happening during the night. Using the same study population, both measured nighttime bedroom exposure and modeled long-term exposure to road traffic noise were found to be associated with a decrease in systolic and diastolic dipping, whereas no association was found for aircraft noise (39). Subsequent longitudinal studies on aircraft noise and risk of CVD found similar associations for modeled daytime noise compared with nighttime noise, which indicates that, for aircraft noise, separating the effects of daytime and nighttime noise is problematic when using standard noise modeling (38, 108). This limitation highlights the importance of improved or new noise assessment methods that better capture the difference in noise over the course of the day.

A recent Swiss study developed a method for estimating an "intermittency ratio" (IR) during nighttime, which quantifies the contribution of individual noise events above the background noise level (105). The IR varies from 0%, corresponding to continuous noise (no events above background), to 100%, corresponding to all noise made by single noise events. It thereby captures a potentially very important aspect of noise, as single distinct noise events during sleep have been linked to awakenings and cardiac arousals (4, 5), and nighttime noise events have been found to affect arterial stiffness (Figure 1b) (27). Data from 4.4 million people indicated that moderate IR levels during nighttime were found to be more strongly associated with overall cardiovascular mortality than were low IR and high IR (41). The project also investigated associations with CVD for noise exposure at different time windows during the day, estimated as combined long-term noise exposure from road, rail, and air based on modeled hourly traffic data (42). Despite the inherent difficulties in separating the effects of different noise time windows (correlations ≥0.94), the combination of the three noise sources yielded more variation, thereby facilitating the analyses. For IHD, the highest mortality risks were found for noise exposure during the core nighttime period, whereas for heart failure, exposure during the daytime period was associated with the highest risk (42). Overall, this

finding suggests that for acute CVD, nocturnal intermittent noise exposure is more relevant than daytime exposure, whereas for more chronic CVD, continuous daytime exposure is most relevant. In support, measured brachial-ankle pulse wave velocity in 2,775 participants (49–81 years old) was significantly associated with the number of noise events during the nighttime (at residence) but not with the number of noise events during the day (Figure 1b) (27)."

"*In summary, the few epidemiological studies that have successfully managed to separate daytime and nighttime exposure to noise have found that nighttime noise is indeed an important risk factor for some CVDs and that intermittent noise with peaks clearly above the background level during the nighttime may be particularly harmful.*"

The review goes on to investigate translation studies and the effects of simulated night-time noise on vascular function.

It also looked into mechanistic insights from animal studies on the effects of around-the-clock noise on stress hormones, oxidative stress, and cerebrovascular complications:

"*A study on mice exposed to noise for 1–4 days found that around-the-clock aircraft noise resulted in higher levels of circulating neurohormonal stress hormones, endothelial dysfunction, vascular inflammation, and oxidative stress*"

This has consequences for the areas of St Margarets The Ward and Portmarnock where the population will be exposed to high levels of both daytime and night-time noise, without any respite.

The study also examined the effects of sleep versus phase noise on the cardiovascular system and the brain and noise and the circadian clock system.

The conclusion of the review states that exposure to noise towards the end of the sleeping period may be the most crucial regarding effects of noise on sleep, and that night-time noise compared with daytime noise is associated with more adverse cardiovascular effects. Compared with daytime noise, night-time noise leads to a stronger stress reaction. Also, evidence suggests that intermittent noise with peaks clearly above the background levels during the night-time may be particularly harmful. This is very evident in the rural areas of St Margarets The Ward, where the intermittent aircraft noise events far exceed the background noise levels.

WHO 2018 Guidelines clearly state that the CNG indoor guidelines [WHO 1999] remain valid:

"*The current environmental noise guidelines for the European Region supersede the CNG from 1999. Nevertheless, the GDG recommends that all CNG indoor guideline values and any values not covered by the current guidelines (such as industrial noise and shopping areas) should remain valid. Furthermore, the current guidelines complement the NNG from 2009."*

The WHO Community Noise Guidelines (https://apps.who.int/iris/handle/10665/66217) make reference to LAmax and single noise events. In its executive summary it states:

"*Currently, the recommended practice is to assume that the equal energy principle is approximately valid for most types of noise and that a simple LAeq,T measure will indicate the expected effects of the noise reasonably well. When the noise consists of a small number of discrete events, the A-weighted maximum level (LAmax) is a better indicator of the disturbance to sleep and other activities. In most cases, however, the A-weighted sound exposure level (SEL) provides a more consistent measure of single-noise events because it is based on integration over the complete noise event. In combining day and night LAeq,T values, night-time weightings are often added. Night-time weightings are intended to reflect the expected increased sensitivity to annoyance at night, but they do not protect people from sleep disturbance.*

Where there are no clear reasons for using other measures, it is recommended that LAeq,T be used to evaluate more-or-less continuous environmental noises. Where the noise is principally composed of a small number of discrete events, the additional use of LAmax or SEL is recommended. There are definite limitations to these simple measures, but there are also many practical advantages, including economy and the benefits of a standardized approach."

In the guideline section it references the use of LAmax for dwellings:

"*In Dwellings. The effects of noise in dwellings, typically, are sleep disturbance, annoyance and speech interference. For bedrooms the critical effect is sleep disturbance. Indoor guideline values for bedrooms are 30 dB LAeq for continuous noise and 45 dB LAmax for single sound events. Lower noise levels may be disturbing depending on the nature of the noise source. At night-time, outside sound levels about 1 metre from facades of living spaces should not exceed 45 dB LAeq, so that people may sleep with bedroom windows open. This value was obtained by assuming that the noise reduction from outside to inside with the window open is 15 dB. To enable casual conversation indoors during daytime, the sound level of interfering*

noise should not exceed 35 dB LAeq. The maximum sound pressure level should be measured with the sound pressure meter set at "Fast".

To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55 dB LAeq on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50 dB LAeq. Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development."

Table 1: Guideline values for community noise in specific environments.

Specific environment	Critical health effect(s)	L_{Aeq} [dB(A)]	Time base [hours]	L_{Amax} fast [dB]
Outdoor living area	Serious annoyance, daytime and evening Moderate annoyance, daytime and evening	55 50	16 16	- -
Dwelling, indoors Inside bedrooms	Speech intelligibility & moderate annoyance, daytime & evening Sleep disturbance, night-time	35 30	16 8	 45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60
School class rooms & pre-schools, indoors	Speech intelligibility, disturbance of information extraction, message communication	35	during class	-
Pre-school bedrooms, indoor	Sleep disturbance	30	sleeping-time	45
School, playground outdoor	Annoyance (external source)	55	during play	-
Hospital, ward rooms, indoors	Sleep disturbance, night-time Sleep disturbance, daytime and evenings	30 30	8 16	40 -
Hospitals, treatment rooms, indoors	Interference with rest and recovery	#1		
Industrial, commercial shopping and traffic areas, indoors and outdoors	Hearing impairment	70	24	110
Ceremonies, festivals and entertainment events	Hearing impairment (patrons:<5 times/year)	100	4	110
Public addresses, indoors and outdoors	Hearing impairment	85	1	110
Music and other sounds through headphones/ earphones	Hearing impairment (free-field value)	85 #4	1	110
Impulse sounds from toys, fireworks and firearms	Hearing impairment (adults) Hearing impairment (children)	- -	- -	140 #2 120 #2
Outdoors in parkland and conservations areas	Disruption of tranquillity	#3		

#1: As low as possible.

The CNG indoor noise level recommendations are still valid as stated by the WHO 2018 Guidelines, and the current guidelines complement the NNG from 2009. Therefore, single noise event indicators cannot be dismissed, as suggested by ANCA, as these are still valid. LAmax is referred to in 200/49/EC as a supplementary noise indicator and therefore ANCA have a duty to take it on board. Evidence has been provided that the LAmax levels exceed the CNG guidelines and Pro PG guidelines in dwellings that have already been insulated by the daa. This evidence cannot be refuted by ANCA, and it has deliberately refused to take this evidence on board.

17.4 SOURCE-BASED SUBJECTIVE RESPONSES TO SLEEP DISTURBANCE FROM TRANSPORTATION NOISE

A 2015 study (https://www.sciencedirect.com/science/article/pii/S0160412016301593) by UCD School of Architecture was conducted to investigate the use of subjective responses to questions concerning night-time noise exposure as a means of assessing sleep disturbance from transportation noise. A site location was chosen to study the impact of noise from Dublin Airport. The site is located in a private housing development 6.3km from the main runway at Dublin Airport directly under the flight path.

The results show that the highest average LAmax was 64.2 dB(A). The report states that the range and standard deviation in LAmax were more variable at the air location site and that this finding is consistent with the high degree of intermittent noise associated with aircraft.

Table 3
L_{Aeq}, L_{Amax} and L_{A90} (8 h) – Monday to Thursday 11 pm–7 am.

	Minutes	*Mean (dB(A))*	*SD (dB(A))*	*Range (dB(A))*
$L_{Aeq,\ 8\ h}$				
Road	1924	51.3	5.2	37.5
Rail	1920	47.1	4.2	25.3
Air	1924	51.3	6.4	35.0
Control	1924	46.6	6.2	23.4
$L_{Amax,\ 8\ h}$				
Road	1924	63.8	5.9	45.7
Rail	1920	57.9	7.7	41.8
Air	1924	64.2	9.8	48.8
Control	1924	60.7	11.4	39.1
$L_{A90,\ 8\ h}$				
Road	1924	41.9	4.5	33.2
Rail	1920	40.0	3.2	19.1
Air	1924	38.1	2.6	19.2
Control	1924	37.6	1.8	13.3

Interestingly the results from the study suggest that LAeq is an inadequate indicator of night-time noise disturbance:

"*It is useful to compare these results with the measurement data from Table 3. Take the air location as an example. There the night-time measured average LAeq value is below 55*

dB(A). In a typical noise assessment, this would indicate that while residents are subject to a potential increase in adverse health effects, frequent adverse health effects would not be expected. However, the subjective data at this location points to levels of bother, annoyance or disturbance in greater than 90% of households suggesting, contrary to the measurement data, frequent adverse health effects. Indeed, while the average LAeq data for the road and air locations are similar, indicating comparable noise environments, the subjective responses to disturbance at the two locations is different. Taken together, the results suggest that LAeq is an inadequate indicator of night-time environmental noise disturbance."

The report concludes that in terms of subjective responses, aircraft noise is overwhelmingly the most disturbing:

"*In terms of subjective responses, our study shows that aircraft noise is overwhelmingly the most disturbing with approximately three quarters of residents at the air location reporting some level of disturbance during a typical week night and over a third reporting interference with their sleep. This result is not significant in itself because previous studies have demonstrated that aircraft noise is highly disturbing. However, its significance lies in comparing the subjective responses with measured data which if relied upon solely would have indicated a relatively unproblematic night-time noise environment*."

The report also references a paper from Murphy and King (https://researchrepository.ucd.ie/bitstream/10197/5692/1/An_assessment_of_residential_exposure_to_noise_at_a_shipping_port.pdf) where the authors argued that the:

"*LAeq indicator tends to underestimate the magnitude of the health impact of environmental noise in terms of sleep disturbance. Indeed, laboratory studies using recorded intermittent and continuous traffic noise have demonstrated that human subjects are more disturbed by intermittent noise than by continuous noise (Öhrström and Rylander, 1982). Furthermore, a field study by Janssen et al. (2014), which investigated the number of aircraft noise events on sleep quality, found that the number of noise events above 60 dB(A)LAmax was related to an increase in mean motility amongst respondents, indicating lower sleep quality. These studies suggest that LAmax may be a more appropriate indicator for night-time noise because it better captures intermittent noise which has a greater impact on sleep disturbance. This is particularly important for the current study given the nature of the noise in the study locations which includes numerous short bursts of loud noise from passing buses, trams and overflying aircraft at regular and irregular intervals.*"

17.5 AIRCRAFT ENVIRONMENTAL NOISE STUDY SURVEY

The St Margarets and The Ward Residents Group contracted the MLM Group to conduct surveys on properties that had been insulated under the daa's schemes. The purpose of the surveys was to investigate the internal bedroom noise to determine what levels of noise the occupants were being subjected to in relation to best international guidance for health. The ProPG Guidelines discussed earlier in this section state that:

"Indoor sound pressure levels should not exceed approximately **45 dB LAmax more than 10-15 times per night**. This guidance on internal noise levels remains current. Accounting for sleeping with a bedroom window slightly open (and a reduction from outside to inside of 15 dB), this translates to an **outside sound pressure of 60 dB LAmax**".

It should be noted that the Fingal County Council Variation #1 to the Development Plan focuses on the ProPG Guidelines:

B	≥ 54 and < 63 dB $L_{Aeq, 16hr}$ and ≥ 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 $L_{Aeq, 16hr}$ and/or ≥ 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 & 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'		

As can be seen from the survey report, property number #1 experienced 20 events > 45 dB LAmax, property number #2 experienced 17 events > 45 dB LAmax and property number #3 experienced 1 event > 45 dB LAmax. As the report states it is likely that these events will increase when normal activity resumes at Dublin Airport post Covid-19. It is also worth noting that the aircraft are operating at a lot lower loading factors than normal times and therefore the aircraft are lighter and therefore climb higher at a quicker rate.

The CEO of the daa, Mr Dalton Philips, is quoted in an RTE article from September 9th 2020 as stating that the load factors of the 31 airlines operating at Dublin Airport were at 39%, compared to 90% a year earlier (https://www.rte.ie/news/business/2020/0909/1164158-dublin-airport-operator-losing-1m-a-day-due-to-covid/). He further states that every day in 2019 around 100k passengers on average used the airport, but that in 2020 the average was down to 16.5k. It is a safe argument to make that with the lower passenger numbers and lower loading factors that the weight of the aircraft would be significantly reduced and requiring less fuel. As a result, the noise experienced in the 3 properties during the surveys is not reflective of normal operations at Dublin Airport and it would be anticipated that the properties would experience even greater noise levels when normal operations resume.

A very important factor to consider in conjunction with the LAmax values is the relative increase from ambient baseline levels at night. At night the quiet periods between flights show LAFmax levels very low in the low 20's. This then increases by as much as 30 dB when there is a flight. That is a very significant change in noise level and would be an increased risk factor for being awoken from sleep and as the next section discusses, an increased risk of a serious cardiovascular event.

This report clearly demonstrates that the insulation scheme provided by the daa fails to adequately protect the residents in the environs of Dublin Airport. They are being exposed to noise levels in their bedrooms that lead to adverse health effects and are at risk to acute cardiovascular events. Insulation is not a safe mitigating factor for these residents and only a complete ban on night-time flights can protect their health.

17.6 HEALTH STUDY ON AIRCRAFT NOISE EVENTS

On December 23rd, the European Heart Journal published an editorial (https://academic.oup.com/eurheartj/advance-article/doi/10.1093/eurheartj/ehaa984/6046141) titled 'Noise and cardiovascular risk: nighttime aircraft noise acutely triggers cardiovascular death'. The editorial refers to 'Does night-time aircraft noise trigger mortality? A case-crossover study on 24 886 cardiovascular deaths', by A. Saucy *et al*., doi: 10.1093/eurheartj/ehaa957.

The editorial discusses how most epidemiological studies have focused on cardiovascular side effects of long-term exposure to transportation noise.

"So far, most epidemiological studies have focused on cardiovascular side effects of long-term exposure to transportation noise (for reviews, see Basner *et al*.[7] and Munzel *et al*.[8]). Importantly, translational studies in humans and animals primarily focused on health side effects of nighttime noise with respect to the cardiovascular system.[9] In humans only one night of aircraft noise triggered endothelial dysfunction, increased stress hormone levels, and deteriorated sleep quality.[10] These effects were even more pronounced in patients with already established CVD.[11] The acute administration of the antioxidant vitamin C improved endothelial dysfunction, suggesting an involvement of reactive oxygen species in the pathophysiology of noise-induced vascular dysfunction.[10] Recent animal studies indicated that aircraft noise applied during the sleeping phase of mice, but not during the awake phase, raises blood pressure, dysregulates genes related to the circadian clock and stress hormone levels, causes endothelial dysfunction, and increases cerebral and vascular oxidative stress.[12] These observations may indicate that the disturbance of sleep (e.g. sleep deprivation or fragmentation) may account at least in part for noise-induced cardiovascular damage."

Even one night's exposure to noise pollution affected the cardiovascular system:

"Epidemiological and translational studies of humans with and without coronary artery disease revealed that nighttime exposure to different transportation noise patterns for only one night adversely affected blood pressure, diastolic heart function, sympathovagal balance, and the plasma proteome.**"**

This study sought to determine the effect of acute exposure to night-time aircraft noise on cardiovascular death. The authors analysed 24886 CVD deaths from the Swiss National Cohort around Zurich Airport between 2000 and 2015. The authors established that:

"for nighttime deaths, aircraft noise exposure levels 2 h preceding death were significantly associated with mortality for all causes of CVD"

The authors also calculated a population-attributable fraction of 3% in their study population and finally concluded that nighttime noise may trigger acute cardiovascular mortality.

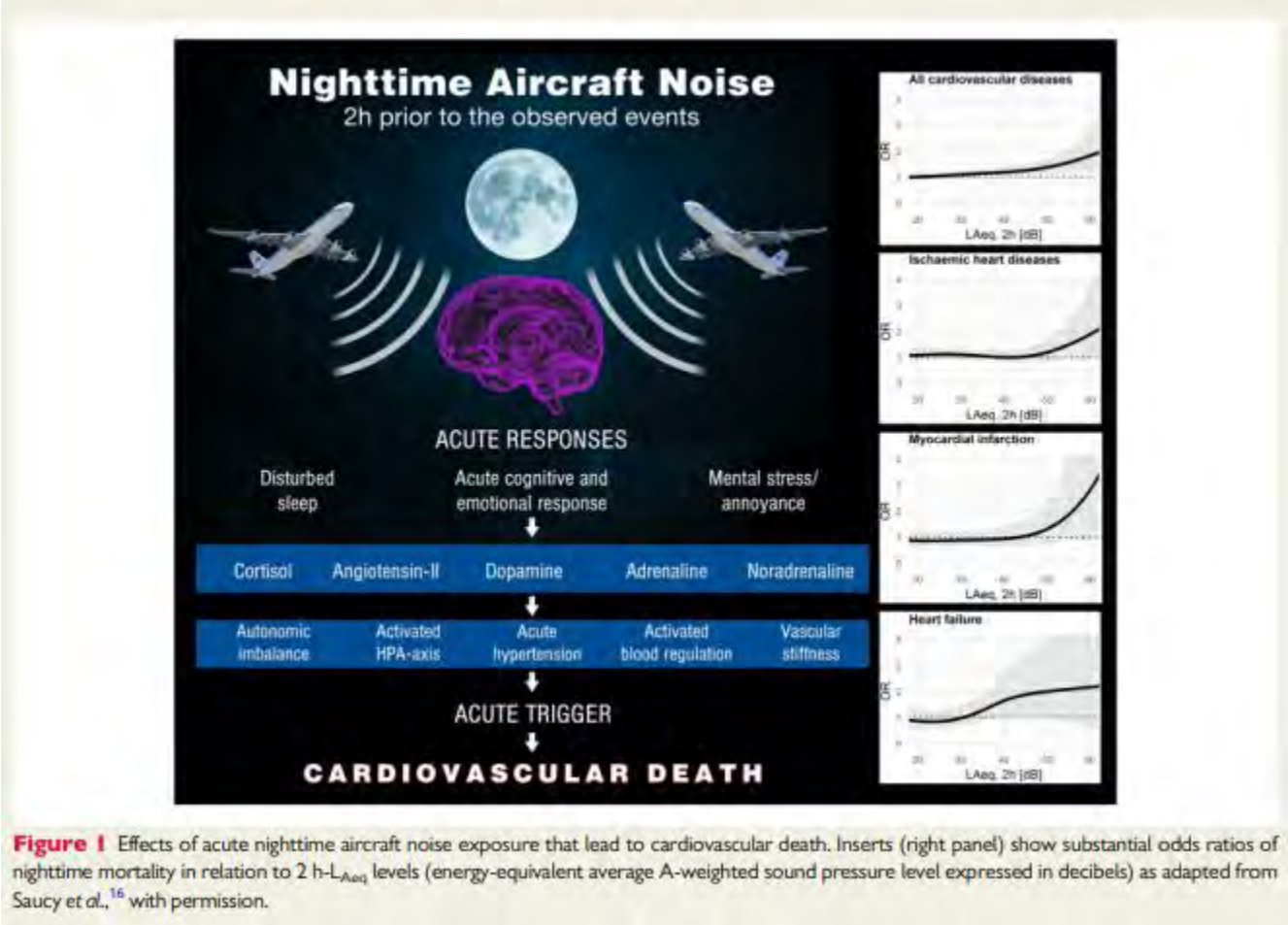


Figure 1 Effects of acute nighttime aircraft noise exposure that lead to cardiovascular death. Inserts (right panel) show substantial odds ratios of nighttime mortality in relation to 2 h-L_{Aeq} levels (energy-equivalent average A-weighted sound pressure level expressed in decibels) as adapted from Saucy *et al.*,[16] with permission.

Quite worryingly, the study found higher associations for people living in areas with low background noise and in buildings constructed before 1970. A large cohort of rural Fingal, Dublin West and Meath would fit into this category and so are more at risk.

The editorial asks the question about these findings: "What are the societal and political consequences?"

They state that this study describes for the first time the acute effect of noise on cardiovascular mortality, indicating that aircraft noise is a trigger for fatal acute coronary events.

The authors suggest that if these findings are confirmed by further studies at airports with higher night-time noise exposure, **a complete ban on night-time flights** must be the consequence and **reinforcing the WHO noise limits**.

Based on this study's findings, Fingal County Council and the Health Authorities should conduct a similar study around Dublin Airport. No such study has ever been carried out.

This editorial shows that LAmax single noise events during the night-time period can trigger fatal acute coronary events, and it is imperative that they should be minimized.

17.7 IMPACT OF AIRCRAFT NOISE POLLUTION ON RESIDENTS OF LARGE CITIES

(Study requested by PETI Committee of the European Parliament: https://www.europarl.europa.eu/RegData/etudes/STUD/2020/650787/IPOL_STU(2020)650787_EN.pdf)

In section 3.4 (Improving Noise Metrics) of this 2020 European Parliament study it states:

"Furthermore, the use of new metrics like Number of Events above a certain noise value are being pushed forward. As it is indicated in the WHO 2018 Environmental Noise Guidelines for the European Region "*There is additional uncertainty when characterizing exposure using the acoustical description of aircraft noise by means of Lden or Lnight. Use of these average noise indicators may limit the ability to observe associations between exposure to aircraft noise and some health outcomes (such as awakening reactions); as such, noise indicators based on the number of events (such as the frequency distribution of LA,max) may be better suited. However, such indicators are not widely used*"."

The above statement refutes the argument made by ANCA on page 21 of its Consultation Report

"There is research which has used alternative metrics to describe the potential impacts of aircraft noise events on sleep, such as indoor and outdoor LAmax levels, their distribution and occurrence. Whilst recognising that such metrics can be used to describe effects such as awakenings and physiological reaction, ENG18 states that: "*the relationship between different types of single-event noise indicators and long-term health outcomes at the population level remains tentative*". As such the ENG18 made no recommendations for single-event noise indicators."

Section 3.4 of the European Parliament study is also referenced in 'Towards Mapping of Noise Impact' (https://link.springer.com/content/pdf/10.1007/978-3-030-91194-2.pdf). It goes on further to state:

"*There is, therefore, a proposal to start giving more priority to other noise indicators (in particular event-related metrics) as well as calculating lower noise level contours to present noise exposure, which is a challenging modification considering the way the noise effects have been studied until now.*

This also supports the notion that annoyance is not just a yearly value and cannot be characterised by a single metric. More and more countries are considering various metrics simultaneously."

In 'Aircraft noise effects on sleep: Substantiation of the DLR protection concept for airport Leipzig/Halle' (https://www.dlr.de/me/en/Portaldata/25/Resources/dokumente/flugphysiologie/ICBEN_Proceedings_2008_p772-779_Leipzig.pdf), the author Mathias Basner presents findings of nocturnal aircraft noise on sleep in polysomnographical laboratory and field studies between 1999 and 2004. The noise protection plan for Leigzig/Halle is presented and substantiated:

(1) on average, there should be less than one additional awakening induced by aircraft noise,

(2) awakenings recalled in the morning should be avoided as much as possible, and

(3) aircraft noise should interfere as little as possible with the process of falling asleep again.

17.8 THE EFECT OF AIRCRAFT NOISE ON STROKE

A study by Seidler et al in 2018 titled '*The Effect of Aircraft, Road, and Railway Traffic Noise on Stroke – Results of a Case-Control Study Based on Secondary Data*' (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6122263/) highlights a 7% increased chance of risk of stroke from Aircraft Noise from 6 single night noise events > 50dB, even though the nightly average was < 40dB.

"*However, stroke risk was statistically significantly increased by 7% [95% confidence intervals (95%CI): 2–13%] for people who were exposed to <40 dB of 24-h continuous aircraft noise, but ≥6 events of maximum nightly sound pressure levels ≥50 dB*".

This shows the importance of LAmax and single noise events relative to average noise values. In the conclusion it states:

"*Overall, this study suggests that traffic noise exposure may increase stroke risk. It furthermore indicates that maximum aircraft noise levels at night increase the stroke risk even when continuous noise exposure is low. This highlights the relevance of maximum noise levels for future research and policies regarding aircraft noise protection measures*".

This study shows the effects of just 6 noise events at night >50dB. As discussed earlier in this chapter, '2025 Proposed' will equate to 56k people exposed to > 10 N60 noise events (N60 is noise above 60dB at night). '2025 Permitted' equates to 45k people subjected to > 10 N60 noise events. Thus, '2025 Proposed' will increase the population exposed to > 10 N60 noise events by 26%.

'2025 Proposed' will have a significant increase in the number of people exposed to > 10 N60 events compared with Gatwick Airport. Gatwick Airport had 33850 people subjected to > 10 N60 events in 2019 (https://www.gatwickairport.com/globalassets/company/airspace/noise-reports/2020/noise-contour-report-2020.pdf). Dublin in comparison had 80k exposed in 2019. With '2025 Proposed', Dublin will have a 65% increase in > 10 N60 noise events compared to Gatwick in 2019.

It is also of note that the CAA in the UK, on behalf of the Department of Transport, used N60, N65 and N70 metrics in their '*Aviation Strategy: Noise Forecast and Analyses*' from 2018 (http://publicapps.caa.co.uk/docs/33/CAP1731AviationStrategyNoiseForecastandAnalyses_v2.pdf).

(It is worth noting that the WHO 2018 Guidelines used research up to 2015, and research such as this from Seidler et al has been conducted since then, and all new research since 2015 should be taken into account when evaluating the health effects of aircraft noise.)

18.0 CONFLICT OF INTEREST

18.1 NOISE CONSULTANTS

Members of the consortium of noise consultants acting on behalf of ANCA have also worked on projects for Fingal County Council. Regulation 598/2014 states that the Competent Authority "*should be independent of any organisation involved in the airport's operation, air transport or air navigation service provision, or representing the interests thereof and of the residents living in the vicinity of the airport*". It further states that "*The competent authorities shall be independent of any organisation which could be affected by noise-related action*".

Fingal County Council is the designated authority for noise mapping under the Environmental Noise Directive 2002/49/EC. Fingal County Council has also developed Noise Zones for planning purposes. Mr Simon Shilton has worked extensively for Fingal County Council with the development of the Noise Zones. Mr Shilton has also been engaged by ANCA as part of the Noise Consultants consortium. It is also worth noting that Mr Shilton is also working for the EPA in Ireland.

Mr James Trow the lead noise consultant for ANCA has also worked on assignments for Fingal County Council when he was employed by Amec Foster Wheeler.

18.2 FINGAL COUNTY COUNCIL

Fingal County Council is the local authority in which Dublin Airport resides. Fingal County Council was not the first choice as Competent Authority and controversy arose when it was initially earmarked for the role (https://www.irishtimes.com/business/transport-and-tourism/council-warned-government-it-could-not-be-noise-regulator-for-dublin-airport-runway-1.3798272). The Director of Services at the time, Ms AnnMarie Farrelly (now CEO of Fingal County Council) wrote to the Department of Transport outlining the concerns of Fingal County Council as the Council is responsible for the County Development Plan, Dublin Airport Local Area Plan and Noise Action Plan which are reserved functions of the Council.

The concerns about the conflict of interest with Fingal County Council was also raised in the Oireachtas (https://www.oireachtas.ie/en/debates/debate/seanad/2019-04-03/9/?highlight%5B0%5D=amendments&highlight%5B1%5D=amendments&highlight%5B2%5D=bill&highlight%5B3%5D=development&highlight%5B4%5D=government&highlight%5B5%5D=development&highlight%5B6%5D=planning&highlight%5B7%5D=development&highlight%5B8%5D=government&highlight%5B9%5D=bill) where it was stated that Fingal County Council received up to 29million euro in rates annually from the airport campus. This is on top of the 21million euro received in development levies for granting permission for the North Runway.

There should be a clear separation of duties between the Competent Authority and Fingal County Council Planning department. It is evident that this is not the case.

Recvd

Comhairle Contae Fhine Gall
Fingal County Council

An Roinn um Pleanáil agus Infrastruchtúr Straitéiseach
Planning and Strategic Infrastructure Department

Fintan Towey
Assistant Secretary
Aviation, Policy Coordination and Human Resources,
Department of Transport, Tourism & Sport
Leeson Lane,
Dublin 2,
Ireland. D02TR60

2nd November 2017

Ref: Engagement with Department of Transport on Dublin Airport noise issues.

Dear Fintan,

Thank you for the meeting held on Friday 27th October, which representatives of Fingal County Council attended at your request. During the meeting there was discussion surrounding which body would be best suited to act as the competent noise authority for noise control at Dublin Airport and the importance of the matter is recognised. It is also acknowledged that Dublin Airport is the principle gateway to Ireland and a major contributor to the national economy. In this regard Dublin Airport represents the most significant single economic entity in Fingal and the Dublin region.

Presently Fingal County Council has an extensive remit in both shaping and determining the strategic direction of Dublin Airport through its land use planning and associated functions. The recent adoption of the Fingal Development Plan was the Council's first step in delivering the tiered structure of plans associated with Dublin Airport, as required under the Irish Planning System. The Development Plan includes policy for the implementation of Government policy to develop Dublin Airport as a secondary hub airport, competing effectively with the UK and other European airports for the expanding global aviation services market. This objective is aligned with strategic policy in the areas of noise, public safety, transport, air quality, water quality

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management and its interaction with surrounding land uses and communities amongst other issues.

The adoption of the Fingal Development Plan is a reserved function of the Elected Members of the Council. In the context of the Balanced Approach, Objective DA09 of the Development Plan, as adopted (and amended) by the Elected Members, already commits to "*Ensure that aircraft-related development and operation procedures proposed and existing at the Airport consider all measures necessary to mitigate against the potential negative impact of noise from aircraft operations (such as engine testing, taxiing, taking off and landing), on existing established residential communities, while not placing unreasonable, but allowing reasonable restrictions on airport development to prevent detrimental effects on local communities, taking into account EU Regulation 598/2014 (or any future superseding EU regulation applicable) having regard to the 'Balanced Approach' and the involvement of communities in ensuring a collaborative approach to mitigating against noise pollution*".

Following from the adoption of the Development Plan, the Council is now in the process of preparing, as required, the Dublin Airport Local Area Plan, in the context of the strategic policy as set out in the parent Development Plan document and other relevant national policy guidance. The Local Area Plan will include more specific objectives for the zoning of land for particular purposes, infrastructural requirements, and such other objectives for the proper planning and sustainable development of the area. Ultimately, the Local Area Plan will be the statutory framework against which future development proposals will be assessed in the area. Again, the adoption of the Local Area Plan is a reserved function of the Elected Members of the Council.

Arising from the delivery of the above referenced statutory planning frameworks associated with Dublin Airport, Fingal County Council is also responsible for determining applications for planning proposals at Dublin Airport, in line with the adopted policy. Part of this function also includes the disposal of planning compliance associated with conditions of such permissions and which may also relate to caveats in terms of operations restrictions at the airport.

In light of the existing complex and varied role that Fingal County Council plays, as outlined above, it is considered that the Council may not be best placed to act as the 'Competent Authority' for the purpose of implementation of the Regulation 598/14 with particular reference

to clause 13. Clause 13 states that "*The competent authority responsible for adopting noise-related operating restrictions should be independent of any organisation involved in the airport's operation, air transport or air navigation service provision, or representing the interests thereof and of the residents living in the vicinity of the airport. This should not be understood as requiring Member States to modify their administrative structures of decision-making procedures*".

Further, Fingal County Council does not have the requisite competencies available within the Council in areas of aviation operations, noise (including contour mapping) and economic feasibility assessments for the purpose of determining the cost-effectiveness of solutions within the context of the 'Balanced Approach' as set out in the Regulation.
In this regard, and again in the context of clause 13 it may be that other independent bodies, which do not hold conflicting responsibilities in the provision of other functions that influence the development of Dublin Airport, should be considered for appointment as 'Competent Authority' for the purpose of Regulation.

I wish to thank you for your engagement on this issue and please be advised that I am more than happy to discuss any of the matters touched upon in my letter or to assist in any way in your progression of the issue.
I look forward to hearing from you in the matter and to our continued positive engagement.

Yours sincerely

AnnMarie Farrelly
Director of Services
Planning and Strategic Infrastructure Department

18.3 DELEAYED ASSESSMENT

On June 25th 2020, the DAA wrote to ANCA informing them of their withdrawal of F19A/0449. In email correspondence from ANCA on July 15th 2020 when queried on the noise assessment, ANCA stated:

"I can confirm that planning application F19A/0449 has been withdrawn by the DAA. Although the aircraft data as submitted by the airport authority as part of the planning application was informative, it was not sufficient to facilitate a full assessment of the noise situation at the airport. ANCA requested detailed additional information but a response to the request was not received in advance of the application being withdrawn. This information is on the planning section of our website. Notwithstanding this, it is the intention of ANCA that a full aircraft noise assessment will be undertaken for Dublin Airport. ***I do not have a date for the assessment at this time*** *but can advise that there will be no pre-determined outcome."*

ANCA could still have requested the information irrespective of the DAA withdrawing F19A/0449 to carry out a noise assessment but declined to do so.

ANCA also neglected to inform the Environmental section of FCC about the increase in noise.

The 32m passenger cap is an operating restriction that ANCA is responsible for under the Aircraft Noise Bill. ANCA were made aware of the 32m limit being breached in 2019 yet failed to act. No repercussions for the daa from ANCA or Fingal County Council for breaching this cap in 2019. The daa acquired passenger charges from 0.9m passengers unlawfully and the Commission for Aviation Regulation also failed to intervene.

It is worth noting that Fingal County Council Planning Department updated their Development Plan with new Noise Zones to take account of night-time noise > 55 dB Lnight. That should have triggered the Environmental section of Fingal County Council to act to enforce mitigation measures at Dublin Airport under their NAP. Unfortunately, that did not happen. Nor did ANCA intervene with the noise problem identified by Fingal County Council Planning Department. ANCA turned a blind eye.

18.4 AIRCRAFT NOISE BILL – GENERAL SCHEME

In the General Scheme of the Bill published in September 2018, Head 6 states that the Noise Abatement Objective is to be defined after the commencement day:

PART II NOISE ABATEMENT OBJECTIVE AND NOISE ASSESSMENT

Head 6 Noise abatement objective to be defined after the commencement day

Provide That:

1) As soon as practicable after the commencement day, the Competent Authority shall:

(a) define, and publish, the draft initial noise abatement objective for the airport;

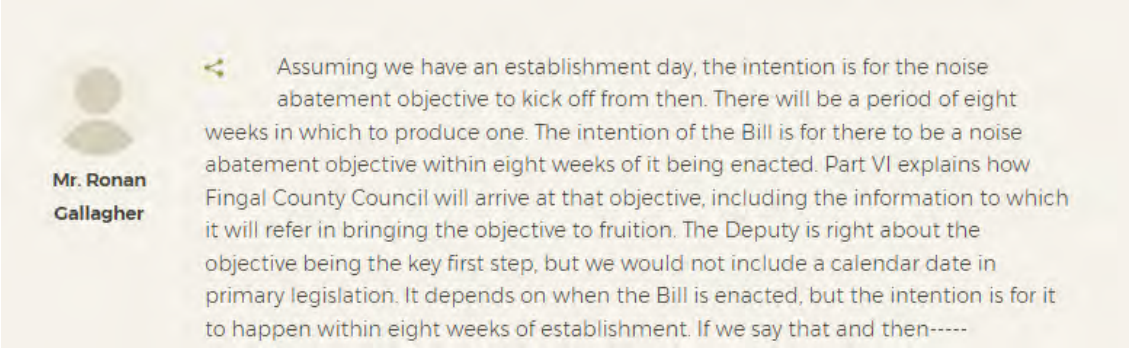
(b) invite submissions in relation to the draft noise abatement objective from interested parties.

The intention of the Bill was to define the Noise Abatement Objective shortly after ANCA were incorporated. The explanatory note with the General Scheme states:

Explanatory Note

This Head provides that once the Competent Authority has been officially designated on commencement of the Act, that they will publish a draft noise abatement objective. The Competent Authority shall invite submissions in relation to the draft noise abatement objective. Following the public consultation and having considered any submissions, the Competent Authority shall define the noise abatement objective. The objective will be defined no later than 8 weeks after the publication of the draft objective.

In a Joint Committee on Transport, Tourism and Sport meeting on Oct 3rd 2018, Mr Ronan Gallagher (Principal Officer at the Department of Transport, Tourism and Sport) answered a question from Deputy Troy on the Noise Abatement Objective:



Mr. Ronan Gallagher

Assuming we have an establishment day, the intention is for the noise abatement objective to kick off from then. There will be a period of eight weeks in which to produce one. The intention of the Bill is for there to be a noise abatement objective within eight weeks of it being enacted. Part VI explains how Fingal County Council will arrive at that objective, including the information to which it will refer in bringing the objective to fruition. The Deputy is right about the objective being the key first step, but we would not include a calendar date in primary legislation. It depends on when the Bill is enacted, but the intention is for it to happen within eight weeks of establishment. If we say that and then-----

Mr. Ronan Gallagher

We will examine the issue. The Deputy is right. We will see if we can define it. The Department's intention is for it to happen without any delay, as everything will derive from it.

However, this requirement to have the Noise Abatement Objective defined within 8 weeks of incorporation of ANCA did not make it to the Aircraft Noise Bill 'as initiated' in November 2018.

It is clear that it was the intent of the Department to have the Noise Abatement Objective defined as soon as possible but ANCA refused to carry out such an assessment under section 9 of the Act.

18.5 SECTION 21(3) REVIEW / DISPUTE RESOLUTION

ANCA used the omission of a noise abatement objective to refuse a section 21(3)(a) review:

"*The airport authority, or a person upon whom there is a noise impact from the airport, may, by notice in writing given to the competent authority, request the competent authority to review the effectiveness of the noise mitigation measures and operating restrictions (if any) on achieving the noise abatement objective"*.

• ANCA stated:

"*Section 9 of the 2019 Act provides for the process of assessment of the noise situation at the Airport. There is no requirement in the 2019 Act to have such an assessment completed by 1st September*."

Section 9(2) states that the Balanced Approach should be applied where a *"noise problem at the airport has been identified*". The 2019 noise statistics clearly show a continuing noise problem and therefore ANCA were mandated to act, and failure to do so was a dereliction of their duties.

Article 1 of EU 598/2014 states:

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

ANCA would only evaluate the noise situation at Dublin Airport when the daa lodged a planning application. This is not a 'Balanced Approach' and the health of the public under the legislation was not being taken seriously and ANCA failed in their duties under the Act and EU 598/2014.

EU 598/2014 states that:

"they shall ensure that dispute resolution is provided for"

ANCA stated that:

"*No regulations have been made by the Minister to date under this section of the 2019 Act and I am not aware of any intentions in this regard*".

There is no dispute resolution available mechanism and Ireland is not compliant with EU598/2014.This is a serious lapse in the legislation for an individual's right to seek redress.

CONCLUSION

In this report we have outlined serious deficiencies with ANCA's regulatory decision and the daa's revised application. A project of this magnitude requires a thorough public consultation. 511k people will be exposed to daytime noise levels > 45dB Lden and 268k people exposed to night-time noise >40dB Lnight in 2025 as a result of the 'Relevant Action'. These contours have been identified by the World Health Organisation as noise limits beyond which leads to adverse health effects. This vast number of people need to be properly consulted and informed. Failure by the daa to hold a public consultation is in breach of the North Runway's planning permission conditions. ANCA also failed to engage fully in the consultation process. There were opportunities after the Covid restrictions were lifted to host public events, but they declined to do so. ANCA should publish the figures on the number of people who logged on to their webinars and whether these numbers can be considered as a valid public consultation. As a result of Covid restrictions, a leaflet drop should have been carried out to inform the public. The majority of people in Fingal and Dublin West are either not aware of the consultation process or unable to make sense of the onerous amount of technical detail. Residents are unaware that their houses qualified for insulation under the daa's submission and subsequently removed by ANCA. This is not proper consultation with the people most affected by the daa's proposal.

This application is deficient and flawed on a number of grounds. It does not consider medium to long term forecasts and the impacts of this proposal. The daa have plans to grow the passenger numbers to 40m+ and this application is a classic example of 'project splitting'. The daa are trying to suggest that the noise situation in 2018 was 'acceptable', when the data from the three rounds of the Environmental Noise Directive clearly shows escalating noise. The noise data used in the Dublin Airport Noise Action Plan 2019-2023 is based on noise data from 2016. The daa have publicly acknowledged that the three rounds of the END show a noise problem. ANCA have also acknowledged that a noise problem existed in the three rounds of the END, yet incredibly choose 2019 as the baseline reference year. 2019 was the year that the daa breached the 32m passenger planning cap. ANCA were informed as was Fingal County Council of the impending breach in 2019 yet declined to take any action. ANCA have responsibility for the 32m cap as it's classified as an operating restriction.

This submission includes a health report from one of the foremost authorities, Professor Münzel, on aircraft noise and their effects on the cardiovascular system. His conclusions are that the night-time period from 23:00-07:00 should be protected and that the effects of the Relevant Action will lead to a significant deterioration in the health of the population affected.

The proposal from ANCA and the daa also fails to take account of the communities most affected. It fails to acknowledge and discuss these communities and the devastating impact the airport's operations have had and will continue to impose on these families. They are only referenced as numbers. The EIAR's definition of significant effects fails these communities. ANCA failed to engage medical expertise on their decision-making process. The residents of Fingal and Dublin West are more than just numbers. They deserve a thorough analysis of the health effects of the daa's proposal. The daa have stated that they don't collect material on the health effects of aircraft noise, nor have they conducted any research. ANCA have also failed to produce any evidence that they have engaged medical expertise.

Based on the noise report conducted on properties already insulated by the daa, it clearly shows that noise insulation is not a solution and that the occupants of these properties are at noise exposure levels that are a serious risk to their health. Only a complete ban on night-time flights can safeguard their health.

A serious flaw with this application is that the daa have failed to justify why they need this 'Relevant Action' to cater for 32m passengers by 2025. The existing South Runway catered for 32.9m passengers in 2019. On those grounds alone, the application should be thrown out.

The regulatory decision outlines how ANCA have accepted almost in its entirety all the proposals from the daa. The only deviation from the daa's submission is the choice of an 8-hour Quota Count System instead of a 6.5 hour one. But even with an 8-hour Quota Count System, ANCA accepted the daa's 16260 count value which ANCA have stated leads to no loss of flights to the daa. The Quota Count System proposed does not have an associated movement limit which is the norm in the UK. The Quota Count System is simply a marketing ploy by the daa that has been accepted by ANCA. ANCA's own analysis shows that the Noise Quota System does not introduce a cost as no flights will be reduced. This is farcical and calls into question ANCA's competence.

ANCA's regulatory decision will lead to fewer houses being insulated under criteria 2 for night-time insulation. Incredibly ANCA don't even realise this and are publicly acknowledging that their changes to the insulation scheme is better than the daa's proposal. How does less houses included in the insulation scheme improve the scheme?

ANCA are also trying to take credit for imposing a 6-hour restriction on the North Runway at night. An Bord Pleanála already imposed planning condition 3(d) which covers an 8-hour period from 23:00-07:00. ANCA should be transparent with the public and state the obvious, that they reduced the limit from 8 hours to 6.

To understand ANCA's regulatory decision, one simply has to take a look at the number of people who will be Highly Annoyed, and Highly Sleep disturbed after their decision. 79,405 people will be left Highly Annoyed and 37,080 will be left Highly Sleep Disturbed. The WHO's definition of Highly Sleep Disturbed assigns a disability weighting of 0.07. This means that being Highly Sleep Disturbed due to environmental noise reduces a completely healthy individual's health by around 7%. The disability weight for Highly Annoyed is 0.02 or 2%. ANCA have failed in their draft decision to account for the health costs associated with the daa's proposal. They also fail to take the carbon emissions costs for the increase in aircraft movements that is facilitated by their decision. As a result of ANCA's draft decision there will be a high price to pay for the public both in terms of health and carbon costs that dwarfs any financial or economic gain from additional aircraft activity. The daa's forecast figures show that their proposal will lead to only an additional 2 flights between 06:00 and 08:00 in 2025 compared with restrictions in place. How can an Independent Regulator inflict serious adverse health effects and costs on the population it is mandated to protect for such limited gain? ANCA has not forensically examined the daa's proposal and has effectively rubber stamped it.

The St Margaret's The Ward Residents submitted a report previously to the Planning Authority, 'DAA Report 22.10.2021.pdf', which is included in Appendix A. ANCA needs to explore relocation options with the daa and Fingal County Council for those people most affected by noise and where ANCA's decisions would leave these people vulnerable to the adverse effects of Aircraft Noise. ANCA are responsible for removing the night-time restrictions and therefore the onus is on ANCA to find a safe environment for these people and their families to live. In their current draft decision, ANCA have not explored relocation options or taken on board the residual health effects and costs associated with their decision. The community has proposed Thornton Hall as such a site that would be acceptable to the community and ANCA need to explore this option in depth. To finance this relocation scheme, the community is advocating an increase to the passenger charge imposed on travellers along the lines of the 'Polluter Pays' principal. The monies raised from such a charge could be ring fenced to purchase Thornton Hall and provide housing for the displaced residents. The cost is borne by the 'Polluter' and not by Government.

In conclusion, we call on An Bord Pleanála to reject this regulatory decision from ANCA as there's no justification for it except inflicting health costs and carbon costs on the public.

APPENDIX A

DAA Report 22.10.2021.pdf

APPENDIX B

Dublin_Airport_Noise_Medical_Report.pdf

APPENDIX C

HealthEffectsOfAircraftNoiseOnTheCardiovascularSystem.pdf

APPENDIX D

Video - "Health Effects Of Aircraft Noise on the Cardiovascular System"

APPENDIX E

NMT 1 2 3 2016 2018 2019 LMAX EVENTS.XLSX

APPENDIX F

HSE.PDF

APPENDIX G

ENVIRONMENTAL HEALTH SUBMISSION FEB 2022.PDF

APPENDIX H

KING_SUBMISSION.PDF

APPENDIX I

SJK ANCA draft decision consultation F20A0668.pdf, SabrinaJoyceKemper.pdf, 00718132.pdf, Enviro Section F20A0668 SJK.pdf

APPENDIX J

Receipt of submission FIN-C338-ANCA-308.pdf

APPENDIX K

AdverseCardiovascularEffectsOfTrafficNoiseWithAFocusOnNightTimeNoiseAndTheNewWHONoiseGuidelines.pdf

APPENDIX L

525093-MLM-ZZ-XX-RP-YA-0001-Aircraft Noise Survey.pdf

APPENDIX M

https://consult.fingal.ie/en/node/15666/submissions

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