Sean Fox & Sheelagh Morris (Nee Fox)

From

[redacted]

ST MARGARETS

Significant Additional Information 13th September , 2021

In relation to

F20A/0668 - Relevant Action

To remove Condition 3(d) & Condition 5

F04A/1775

of the night time restrictions at Dublin Airport.

Submission to ANCA

Dated: February 08th 2022.

We represent the Fox family whose family home is in existence in Dunbro , in St Margarets for the last 63 years with our parents coming to Dunbro Lane in 1947 .

Dunbro Lane is located between the North and South Runway and will be subject to the cumulation of aircraft and ground noise and all other airport operational noise , on the opening of the North Runway in conjunction to the operation of the current runway, currently with no restrictions. The impacts of a busy airport with two runways operating fully for 16 hours a day with increased ATMs from 7am – 11pm at night cannot be experienced until this becomes a reality. Sean is one of two farms deriving income from tillage every year. There is a total of 7 households living on Dunbro Lane currently. The second farm is one of the remaining milk and dairy suppliers in the area.

[redacted] is located at the end of North Runway, and is in the flightpath , once operational with the centre line of the runway used for take off and landings.

[redacted] is the home and farmland of the extended Fox Family.

Raymond Fox and Sheelagh Morris(Fox)

A further two family homes and residences.

GLOSSARY

ANCA - Aircraft Noise Competent Authority

ABP - AN Bord Pleanala

ATM – Air Traffic Movements (include aircraft taking off and landing aircraft as individual counts)

ATC – Air Traffic Control.

DRD – Draft Regularity Decision - issued by ANCA - the subject of this submission.

FCC - Fingal County Council

FPGOR - Flight Path/Ground Operations Residents.

FDP – Fingal Development Plan.

NAP - Noise Action Plan

NAO - Noise Abatement Objective.

SID – Standard Instrument Departure.

END - European Noise Directive.

CAR - Commission for Aviation Regulations.

SID – Strategic Infrastructure Development.

SID - Standard Instrument Departure – Aviation tool for aircraft take off.

WHO - World Health Organisation.

AQS – Aircraft Quota System.

VDPS – Voluntary Dwelling Purchase Scheme – set up by daa and FCC in December 2016

VDIS - Voluntary Dwelling Insulation Scheme for homes within the 63dB laeq16 contour.

Following grant of permission with the imposition of 31 conditions by ABP in August 2007, the applicant applied to cherry pick the night time restrictions , and request removal under SID . (Strategic Infrastructure Development) Condition 3(d) and Condition 5 in August 2008 . This was refused to the applicant by ABP.

An Bord Pleanála.

Inspector's Report.

Case Ref. No:	**06F.PC0056.**
Issue:	**SID Pre-application – whether project is or is not strategic infrastructure development.**
Proposed Development:	**Revisions to the permission for a new parallel runway granted under PL06F.217429.**

Assessment.

Essentially the proposed development involves removing condition 5 and altering the wording of condition 3 of PL06F.217429. The prospective applicant states that this constitutes a material change of use.

Planning permission was granted by the Board for the new parallel runway under PL06F.217429. That application was lodged before the Planning and Development (Strategic Infrastructure) Act, 2006 became operative.

The runway has not been constructed. As there is no existing use of the runway, the alteration of the terms of PL06F.217429 would not constitute a material change of use, in my opinion.

Refusal by ABP for SID application to remove Condition 3(d) and Condition 5.

The runway has not been constructed. As there is no existing use of the runway, the alteration of the terms of PL06F.217429 would not constitute a material change of use, in my opinion.

The above states the fact. There is no runway constructed, no existing use of the runway, therefore the request was invalid as there was no structure to base the material change sought.

(What is sought is the use of runway hours from 16 hours to 24 hours with scheduled flights 16 hours a day and 2 hours in the night time period before the final construction with a JIT

(Just in Time approach)

At this point, January 2022 , there is no existing use of the runway to request the material change in the planning. This change to the planning condition is therefore invalid. It is attempting to bypass the future process, after the runway opens with the current conditions set out by ABP in August 2007. With the setting up of ANCA, the removal of the night time restrictions , would be pre-empted and included in the required NAO (Noise action abatement) and the new NAP (Noise Action Plan due to be renewed in 2023) This seriously compromises the affected residents of Dunbro and Millhead and has legal consequences.

In 2016 daa announced the new runway construction and operation. (following a lapsed period of 9 years from date of planning permission – August 2007) On December 20th 2020, an application was submitted to FCC to remove the night time restrictions , in place to protect us for 8 hours – night time 1100pm – 0700am . (following a variation passed by FCC to change zonings in the current development plan).

We are rigorously and ultimately objecting to this application, based on the adverse affects to our health , in physical, mental and legal terms. The gravity cannot be quantified in this application in real terms. We find this decision by the applicant to be extremely distressing and disrespectful to those involved in the original application F04A/1755 to safeguard the future of their homes and livelihoods and quality of life.

The mitigation solutions put forward have not truly considered the impact on the directly affected residents.

Daa see this as a right to passage ,just a process , to force the community out of their way, to obtain their objective – just as it started in Barberstown Lane in the 1960's and 1970s. Their sense of entitlement to trample on the community and those adversely affected is clearly communicated to the public, by their press releases, all done in a timely fashion.

This places those living in [redacted] and [redacted] and Kilreesk Lane in an uncompromising position, in relation to health and well- being and future uncertainty , and referred to as statistics by the Applicant and ANCA in their reports and draft decision. The mitigation measures fall far short of the health risks and mental anxiety and futures of those directly affected. The gravity of the health impacts have been seriously overlooked with mitigation solutions that do not go far enough.

– What is this application about.

This application is part 2 of the original planning application F04A/1755. Part 1 was to obtain the planning permission initially, to proceed with the construction of the runway, with the intention of defying and breaching the conditions in its entirety. The grant of permission was approved subject to the 31 conditions, fully adhered to. This is a legal planning document and all parties subject to the adherence of all 31 conditions. To breach and cherry pick the night time restrictions removes the health safe guards Condition 3(d) and Condition 5 in favour of economic benefits and is not acceptable to the human health of the affected residents co-existing on the boundaries of the airport.

Extract from ABP – Board Direction – 27th August 2007

In deciding not to accept the Inspector's recommendation to refuse permission, the Board considered that adequate information had been submitted in the Environmental Impact Statement, in further information submitted both to the Planning Authority and the Board and at the oral hearing to enable it to make an assessment of the significant impacts of the proposed development on the environment and its acceptability in terms of proper planning and sustainable development. The Board considered that in overall terms, the inconsistencies or deficiencies in information referred to by the Inspector were not so significant as to warrant a refusal of permission or could not otherwise be addressed by way of condition. In particular, the Board was satisfied, on the basis of the information submitted and the conditions attached, and, having regard to the fact that there are no planning restrictions on the current operation of the airport runways, that- (1) there would be no significant deterioration in noise conditions at night time in the vicinity of the airport due to

the proposed Option 7b operating mode for the runways (non-use of new runway and of cross runway at night) and the restriction on night-time aircraft movements by way of condition, (2) in relation to day time noise, there would be some improvements relative to current or future noise impacts with the existing runway system to be offset against disimprovements in other areas/respects and the net effects would not be significant in terms of public health and safety such as to warrant a refusal of permission

The words – *by way of condition*, is the key here.

This permission was granted on the above grounds. (Non-use of new runway and of cross runway at night)

3. On completion of construction of the runway hereby permitted, the runways at the airport shall be operated in accordance with the mode of operation – Option 7b – as detailed in the Environmental Impact Statement Addendum, Section 16 as received by the planning authority on the 9th day of August, 2005 and shall provide that -

(a) the parallel runways (10R-28L and 10L-28R) shall be used in preference to the cross runway, 16-34,

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

(c) when winds are easterly, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10R shall be preferred for departing aircraft, and

(d) Runway 10L-28R shall not be used for take-off or landing between 2300 hours and 0700 hours,

except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports.

Reason: In the interest of clarity and to ensure the operation of the runways in accordance with the mitigation measures set out in the Environmental Impact Statement in the interest of the protection of the amenities of the surrounding area.

And replace with the following under a "Relevant Action"

'Runway 10L-28R shall not be used for take-off or landing between 0000 hours and 0559 hours except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports or where Runway 10L-28R length is required for a specific aircraft type.'

The net effect of the proposed change, if permitted, would change the normal operating hours of the North Runway from the 0700hrs to 2300 hrs to 0600 hrs to 0000 hrs.

The Relevant Action also is: To replace condition no. 5 of the North Runway Planning Permission

5. On completion of construction of the runway hereby permitted, the average number of night time aircraft movements at the airport shall not exceed 65/night (between 2300 hours and 0700 hours) when measured over the 92 day modelling period as set out in the reply to the further information request received by An Bord Pleanála on the 5th day of March, 2007.

Reason: To control the frequency of night flights at the airport so as to protect residential amenity having regard to the information submitted concerning future night time use of the existing parallel runway."

And replace with the following:

A noise quota system is proposed for night time noise at the airport. The airport shall be subject to an annual noise quota of 7990 between the hours of 2330hrs and 0600hrs. In addition to the proposed night time noise quota, the Relevant Action also proposes the following noise mitigation measures: - A noise insulation grant scheme for eligible dwellings within specific night noise contours - A detailed Noise Monitoring Framework to monitor the noise performance with results to be reported annually to the Aircraft Noise Competent Authority (ANCA), in compliance with the Aircraft Noise (Dublin Airport) Regulation Act 2019

ANCA have now issued their decision, (Draft Regulatory Decision). ANCA have not only considered the requests, but went far and beyond the request, permitting 16,260 noise Quota counts between 2300pm – 6.59 am (8,270 in excess of what was requested) and now the subject of this submission. This consultation is just another process that will be logged and submissions from the significantly affected victims ignored, as part of the planning process to justify the outcome and a mere tick box exercise.

Daa are proposing and seek approval from ANCA to change the night time hours, imposed by ABP , based on an economic reason to trample on those adversely affected, in terms of health and well being.

The Applicant is also seeking to direct and influence ANCA (part of FCC) to produce a NAO (Noise Abatement Objective) under their cNAO proposals with their data, in parallel to removing the night time restrictions, with a dual approach. It is important to note here, that Dublin Airport currently has no restrictions and when the NAO is live, this will then introduce restrictions to Dublin Airport.

So this planning application has three objectives.

- Deal with flight path issues not addressed with the community of St Margarets.
- Introduce a NAO with the least number of restrictions to suit the airport operator and direct its content and procedure and implementation , prior to start date, to the detriment of Dunbro and Millhead and Kilreesk Lane. This will place the airport operator as a regulator as well as the body to be regulated . So the question is, who regulates the regulator. The NAO is required as part of the European Directive 598/2014 and the END. (European Noise Directive)
- Remove the night time restrictions – non use of schedules flights on runway 10L-28R. Should this be granted, night time hours will be defined at Dublin Airport as 12pm to 0600 hrs – giving 6 hours sleep to those adversely affected – effectively removing 2 hours sleep and tranquil rest time, required for health and well-being. Night time per the WHO is 11pm to 7am in the morning.

As part of the planning conditions, a voluntary noise insulation scheme and voluntary buy out scheme were paramount, in the interests of those impacted by the day time noise – 16 hours 7am – 11pm - on the operation of the new runway, as a mitigation measure. This was part of the planning approval, for the protection of Health and well-being of those adversely affected.

7. Prior to commencement of development, a scheme for the voluntary noise insulation of existing dwellings shall be submitted to and agreed in writing by the planning authority. The scheme shall include all dwellings predicted to fall within the contour of 63 dB LAeq $_{16\ hours}$ within 12 months of the planned opening of the runway for use. The scheme shall include for a review every two years of the dwellings eligible for insulation.

Reason: In the interest of residential amenity.

8. The runway hereby permitted shall not be brought into use until noise insulation approved under conditions numbers 6 and 7 above has been installed in all cases where a voluntary offer has been accepted within the time limit of the scheme.

Reason: In the interest of the amenities of residences and schools in the area.

9. Prior to commencement of development, a scheme for the voluntary purchase of dwellings shall be submitted to and agreed in writing by the planning authority. The scheme shall include all dwellings predicted to fall within the contour of 69 dB LAeq $_{16\ hours}$ within twelve months of the planned opening of the runway for use. Prior to the commencement of operation of the runway, an offer of purchase in accordance with the agreed scheme shall have been made to all dwellings coming within the scope of the scheme and such offer shall remain open for a period of 12 months from the commencement of use of the runway.

Reason: In the interest of residential amenity.

Now the daa apply to breach those conditions by way of moving the planning goalposts, to have 24 hour operation on both runways, (scheduled and unscheduled) and the VDPS and VDIS remain the same, with the applicant claiming entitlement to do so. (with night flights now included in their VDIS). The interpretation of the conditions enabled the daa and FCC to devise a scheme that has been put forward as a premium of 30% on top of the daa's valuation of homes, that has been put forward creates a perception by daa and FCC that is truly false. The extension period of three years will benefit the applicant not the

homeowners and place them in a prolonged limbo , causing stress and anxiety with the future uncertain, to eventually force them from their homes.

The first media coverage of the proposed change to 24 hour flying, was reported in "*The Northside people " - 6th January – 12th January 2021 - front page – Main headline.*

DUBLIN AIRPORT WANTS NIGHT HOURS CHANGE

Daa, who own the airport, say they want to change what it claims are "onerous conditions" for the hours during which it can operate.

Daa is proposing that North Runway would only be used between 6am and midnight, meaning that there would be no flights on the new runway during the core midnight to 6am night time hours.

"We had originally wanted to have these two onerous conditions removed entirely" says daa Chief Executive Dalton Philips.

"But having engaged with the local community and listened to their views we have revised our previous position and are now proposing very significant mitigation measures.

Under daa's new proposals the overall effects of night-time noise at Dublin Airport are less than envisaged under the planning permission granted in 2007, and do not exceed those of 2018.

Within the planning application, daa is also proposing a new €7million insulation scheme for dwellings that are most affected by night-time noise. The proposed scheme would see grants of €20,000 paid to the owners of up to 350 eligible houses.

Daa has already established an insulation programme for about 200 local households and has established a voluntary scheme to purchase up to 38 properties that will be most affected by the operation of the North Runway at a significant premium to their market value if the runway was not being built.

" The new proposal balances the requirements of the Irish economy with the valid concerns of the local community" , according to Mr Philips.

This statement to the public is deceitful and simply false information , to create a perception the applicant has the right to change the conditions. Night time core hours are from 11pm to 7am per the WHO . There has been no meaningful engagement with the "community" and the change is that daa expect to remove the night time restrictions, placing each adversely affected homeowner in a comprising position.

Anca have agreed , in their DRD (Draft Regulatory Decision) with the wording of UP TO €20,000 and anything over that amount will be borne by the affected homeowner. The article states a different view to the public. So the value of removing the night time restrictions has been placed at €20,000 maximum.

In keeping with the conditions, all parties were to adhere to 16 hours scheduled flights on North Runway with NO SCHEDULED FLIGHTS from 1100 to 0700 in the morning. ABP only granted the permission on that basis.

To say that

Under daa's new proposals the overall effects of night-time noise at Dublin Airport are less than envisaged under the planning permission granted in 2007, and do not exceed those of 2018 is simply false, as in 2018 there was no scheduled or non scheduled flights on a North Runway, as there was no North Runway open. So to compare the existance of a runway with assumptions and forecasts v the non existance of a runway in 2018 , is creating a false perception to the public and to those affected and distorting the facts.

The Planning Conditions state

(d) Runway 10L-28R shall not be used for take-off or landing between 2300 hours and 0700 hours,

except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports.

The exceptions above and the proposals to breach the planning permission will open runway 10L -28R - 24 hours a day and also 10R-28L . (with the exceptions permitted in the planning approval) These exceptions will be diluted to suit the applicant.

This is a major shift from the legal agreement by Daa initially to obtain the planning permission in the first instance.

NIGHT TIME HOURS IS 1100 TO 0700 AM

The WHO guidelines clearly states the night time hours and this was clarified at the oral hearing and corrected.

4.4. WHO Guideline Values

The WHO guideline values in Table 4.1 are organized according to specific environments. When multiple adverse health effects are identified for a given environment, the guideline values are set at the level of the lowest adverse health effect (the critical health effect). An adverse health effect of noise refers to any temporary or long-term deterioration in physical, psychological or social functioning that is associated with noise exposure. The guideline values represent the sound pressure levels that affect the most exposed receiver in the listed environment.

The time base for LAeq for "daytime" and "night-time" is 16 h and 8 h, respectively. No separate time base is given for evenings alone, but typically, guideline value should be 5 –10 dB lower than for a 12 h daytime period. Other time bases are recommended for schools, preschools and playgrounds, depending on activity.

The available knowledge of the adverse effects of noise on health is sufficient to propose guideline values for community noise for the following:

a. Annoyance.
b. Speech intelligibility and communication interference.
c. Disturbance of information extraction.
d. Sleep disturbance.
e. Hearing impairment.

Extract from the WHO guidelines for community noise 1999.

The applicant is attempting to influence a perception that night time is core hours 12pm – 6am and remove 1100 – 11.30 from any aircraft noise monitoring (30 minutes) as part of the AQS. (aircraft quota system) . thus muddying the waters.

Night time is 8 hours - 11pm to 7am . The applicant titles the hours 11.00 – 11.30pm and 0600 – 0700 as shoulder hours.

Fact is – 1100 – 11.30 is night time and 0600 – 0700 is also night time for the purpose of sleep and rest, health and well-being.

Extract from Ruport Thornley Taylor Document - June 2007 - Oral Hearing for F04A/1755

1 The Development currently sought by the Applicants

The EIS considered a range of operational scenarios Between the submission of the EIS and the opening of the hearing, one operational scenario known as Option 7B has been favoured by the applicants and it was confirmed by the applicants to the hearing, through their council Mr O Donnell, that the applicant would be content to be restricted to the use on the new runway in accordance with the assumptions of Option 7b In Summary these Assumption are :

(4) No operations at night defined according to the noise contour period as 2300 – 0700 on runway 10L-28R with very limited exceptions.

The definition of night for these purposes was confirmed by Mr O Donnell as 2300 – 07.00 not 2300 to 0600 as referred to in the EIS Addendum 2. The Exceptions were clarified by Mr Andrew Evans as follows:
Where safety, maintenance considerations air traffic demand and environmental considerations require the proposed runway at night "is to be interpreted such that in clarification of the term **"air traffic demand**" this was included to cover broader airline traffic issues not necessarily covered by the safety and Environmental issues at Dublin . These demand might occur as a result of widespread traffic disruption over a large area perhaps as a result of adverse weather , technical problems with Air Traffic Control systems or declared other emergencies at other airports **. It does not mean air traffic demand or capability**

So it is very clear from the Oral hearing and conditions agreed, daa agreed to the night time restrictions 1100 – 0700 with exceptions – clearly documented as **no scheduled flights due to air traffic demand or capability.**

Dublin Airport will have three runways to operate fully for 16 hours a day and will increased ATMs will follow at Dublin Airport. So the 2018 comparison in terms of ATMs is not true and factual . Night time will permit 65 movements on South Runway , in the interest of local residents sleep, health and well-being.

Chapter 5

- Consultation as perceived by the applicant to the community and to the local authority and the public.

The applicant Daa give the perception that the community of St Margarets have been engaged with, in the matter of aircraft noise and the impacts considered in their mitigation solution, of a voluntary insulation scheme and voluntary buy out scheme. The term VDIS and VDPS say it all. The homes and lives of residents under the flightpath and parallel to the runways are titled " dwellings" These "dwellings" are homes, some for 3 generations to the families, who have an identity with the area and rural setting, in the shadow of the airport. Over the last three FDP's (Fingal Development Plans) St Margarets has been taken off the rural village list in North County Dublin by FCC. In place of RV (rural Village) St Margarets was first changed to RVI status and then Special Policy area, and then included in the Dublin Airport Masterplan, and finally now the St Margarets Special Policy Area. This has evolved over the last twenty- three years in the formation of the FDP with Dublin Airport. (Daa own Dublin Airport) There are currently plans put forward by FCC for the future of the village, as a cultural area, in conjunction with Dunsoghly Castle. This is aspirational.

The applicant has always used the media to state, the local community were engaged with and considered in the planning for this new runway. The process for the planning of the new runway, has proved to be the opposite, with those directly adversely affected, being considered insignificant in the vision and execution of the runway and airport expansion to date. No meaningful engagement , or consideration has been afforded to the residents most affected. What has been experienced has been roadblocks, frustration and a process that excludes the real issues for us. (a tick box exercise)

If we read the press release on the Northside People again on 6th January , two weeks after the applicant applied to breach the conditions on night time restrictions, (Chapter 3 – page 9) and compare it with the words of the CEO of Daa , Mr Dalton Philips , on 14th February 2019 – it relates a very different address to the flight path residents:

Whether it is one household or 200 households under the flightpath, I am really sorry for them, I really am, but that is a matter for them"

He also stated " it was not right that we are not allowed to fly between 6am and 7am" and stating that the M50 is buzzing at that time and so should the airport"

I can assure the reader, this was no laughing matter for those adversely affected by the impact of runway 10L-28R then under construction. In fact we view it as a veiled threat and deliberate attempt to remove their responsibility and duty of care by the applicant in this application. Once the runway opens, Daa will be relieved of their responsibility as this moves to the IAA and ATC. The night time hours and 11pm – 12am and 0600 – 0700 am will be removed – 2 hours removed from critical health and welfare requirements for human health.

Access to Information and Understanding a text book impact.

There was great difficulty in viewing the documents on the planning file, for this application , and in receiving them , making it difficult for those adversely affected to receive the planning files. To view the significant data, metrics, assumptions, models, noise metrics , projected calculations as best we could, in our limited knowledge of aviation, we had to purchase hard copies to gain some understanding of what is proposed. The cost was substantial as the files uploaded were not in order and impossible to download properly with the vast number of pages per document/documents. This raises the question of easy access to the information, that was so negatively significant , in the future health and well being of adversely affected residents. The actual impact of North Runway will only be measured when the ATMs commence, on the granted permission of 16 hours per day , in

addition to the South runway. The Applicant is seeking to bypass this real time analysis and assessment, and go direct to 24 hour flights at Dublin Airport (scheduled and non scheduled those being the exceptions, open to perception) The Health impacts from studies in Frankfurt and Zurich , where night studies were completed, gives a robust account of those impacts.

The planning permission with 31 conditions was imposed on all parties, and daa , due to their position, with a view of entitlement, have chosen to trample on those Health and well being safeguards put in place for the flight path and parallel runway homes that are adversely affected. This application is about four different and separate airport issues.

1. Removing the night time tranquillity required for sleep and rest, imposed by ABP in 2007. – 8 hours 2300 – 0700 am . (removing 2 hours sleep time each night x 365 days a year for eternity)
2. Introducing the flight paths as part of the runway – this should be a separate planning application. Once the runway opens for scheduled flights , DAA will no longer be accountable for noise issues as this will fall on the IAA and Air Traffic Control (ATC). This is not acceptable as this runway and permission is the property of DAA.
3. Precursor to application for increasing passenger numbers from 32million to 40 million in 2025. This was originally part of the discussions with FCC and ANCA to be included in this application, but was deferred until 2025, when passenger numbers are due to be at peak again and in anticipation of this planning approval.
4. Introduction of the Noise Quota System instead of ATMs at Dublin Airport. Dublin Airport has no restrictions currently. The operation of the new runway brings into place restrictions for the first time . The NQS is a matter for each airport to implement under the NAO and daa have proposed a cNAO to ANCA to agree upon, when in actual fact, there is no NAO in place and is a requirement to do so by ANCA without the night time restrictions in place per the planning permission document. In the DRD – Anca have not only approved the 7990 AQC's but increased the figure to 16,260 - an increase of 8,270 prior to the NAO or the 2023 Noise Action Plan formulated, prior to the public consultation process. This places those directly under the flight path the direct targets of constant maximum aircraft noise - 24 hours a day , with no relief, and denies the right to tranquility and the right to a proper nights sleep.

5. Daa have proposed this AQS would be reviewed every five years by ANCA and FCC – when there is a limit of a 6 months season placed on QC points, and this is at the discretion of the airport operator, how they are assigned. The AQS is not designed for those under the flightpath or parallel to the runways, as it does not consider the number of SEL's and lamax levels , envisaged to cause sleep deprivation and health

issues. The contours used are the Lnight and Lday to support the noise measurements and this is not acceptable for those trapped in between the runways and under the direct flight path (the Longitudinal contour – 0 – 3000 ft) . A grant of permission would present a position of entrapment for those in the Longitudinal corridor with no solution going forward.

In advance of this application FCC had changed the FDP – 2018 -2023 to introduce " Land Use Management" as a tool to apply for a "Relevant Action" to remove the night time restrictions. The Land use management was not part of the planning permission and the removal of conditions 3(d) and 5 effectively deems the whole planning permission invalid, if permitted.

FCC in collaboration with daa have devised a VDPS and VDIS without the meaningful and agreed input from those adversely affected, now leaving them in a future time sensitive limbo with a gun to the head situation. The wording of the conditions relating to the insulation and the Home Buy out were open to interpretation and so, the affected homeowners were excluded and considered collateral damage in the vast economic benefits to the country. – Too Small to matter – insignificant and the Applicant too big to fail.

[redacted] was not initially included in the VDIS until pressurised by the homeowners and finally included in the scheme. Six of the homes are insulated on Dunbro, with my knowledge at time of writing. The property of [redacted], the family home has not been insulated to date, due to the questions arising on the future aircraft and ground noise that will impact further , when the North Runway becomes operational.

A Statement of Need was completed by the Applicants consultants , stating the dB level was at 62.6 (just 0.4 of 63dB – the band that permitted eligibility for the insulation scheme)

[redacted] Bungalow – Survey date – 31.5.2018 – from 1100 – to 11.45. – Anderson Acustics.

When one considers that [redacted] was not initially considered a noise zone for insulation and the Statement of Need puts the residence of [redacted] at 62.6 is important to note. No noise monitor was placed in [redacted] to monitor the noise from the current runway

(showing 62.6 bizarre and raises questions why not?)

THE SETTING UP OF ANCA AND ITS ROLE

(Extract from EIAR Appendix 13A)

As part of aviation legislation, Directive (EC) 2002/49/EC of the European Parliament and of the Council of 25th June 2002 relating to the assessment and management of environmental noise, as amended by the Commission Directive (EU) 2015/996 of 19th May 2015 establishing common noise assessment methods.

The regulations are to be known as the European Communities (Environmental Noise) Regulations 2018 and came into operation on the 31st December 2018. They require the production of strategic noise maps and set agglomerations, major roads and major airports. They also require the production of subsequent action plans.

The EU introduced EU Regulation 598/2014 in 2016. This repeals 2002/Ec2 which set out procedures and rules for the introduction of noise related operating restrictions to the busiest European airports. This previous regime for managing noise airport noise placed the responsibility with the airport operator. The entry into force in 2016 of EU Regulation 598/2014 represents a shift in responsibility from the airport operator to a separate independent statutory entity or competent authority to oversee the delivery of the new, more prescriptive approach to airport noise management.

NOTE HERE : DAA were responsible for noise management at Dublin Airport.

NOTE: Dublin Airport has enjoyed the monopoly of setting their own standards on aircraft noise and other regulations, up to the present day. NOTE : THERE are NO RESTRICTIONS CURRENTLY at DUBLIN AIRPORT

This is set to change with the legislation of the setting up of the ANCA (The Aircraft Noise Competent Authority) reporting to Europe under EU598/2014 with the setting up of an NAO (Noise Abatement Objective) as part of the Environmental Noise Directive.

So this application is more than changing the 2 conditions and permitting 24 hour flights at Dublin Airport. Should this be permitted, the current runway will be permitted to operate 24 hours a day as they currently do, overriding the 65 movement as specified in the grant of planning F04A/1755 by ABP.

This application is about transferring the responsibility for noise and airport activity to ANCA, IAA and ATC – should this application be granted.

The wording on the application fails to state that this is the setting up of noise regulations by daa , worded and composed by daa for the NAO as daa are the only candidate making the recommendations. This is a biased approach and does not consider those between

the runways and in the flight path, where mitigation measures cannot realistically be achieved and do not go far enough.

13A2.5

Regulation (EU) No 598/2014 under Article 5 requires that member states shall ensure that the Balanced Approach is adopted in respect of aircraft noise management at those airports where a noise problem has been identified.

To that end, they shall ensure that the Noise Abatement Objective (NAO) for that airport is identified. To that end, they shall ensure that the Noise Abatement Objective (NAO) for that airport is defined. This then allows the measures available to reduce the noise impact to be identified, and the likely cost-effectiveness of the noise mitigation measures to be thoroughly evaluated.

So here we have the role of ANCA to set up a NAO to be thoroughly evaluated, in parallel to this Relevant Action with daa as the only candidate application.

The applicant is using this planning application to influence ANCA with their cNAO projections and assumptions on planning permission that does not currently exist,

to ignore current and legal grant of planning permission , conditions 3(d) and Condition 5 that clearly breaches what was committed to by daa. All parties were subject to the planning permission set out to be adhered to by ABP in August 2007. DAA set the bar, by submitting their preferred base lines, noise mapping , assumptions, projections estimates, for a runway that had not yet opened for operation.

This is borne by the fact that daa have placed a €20,000 amount for additional insulation for those homes as the compensatory figure , for the loss of a night time tranquility and health impacts and have failed to change the VDPS , again failing to recognise the consequences for the runway victims of this life changing decision. The costs of the significant health consequences on the Health Service, on individuals has not been costed in this application.

13A.2.6

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

13A2.8

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

The amended PDA was put in place by FCC to permit the applicant to apply to remove (not replace) Conditions 3(d) and condition 5. ABP refused permission to daa in 2008 to remove the night time restrictions under SID. So a solution was arrived at. Remove it from the Seventh Schedule of the PDA. – So SID process no longer applicable to airport infrastructure. So this is the first such development , and what will follow, that will give Daa the monopoly to do as they wish, in the name of economics , trampling on health and well being.

We see in 13A2.8 the Noise act was amended to remove airport Infrastructure for the Seventh Schedule of the PDA and SID planning is no longer applicable to it.

So we see new legislation introduced , through FCC to justify and present a false perception that these conditions 3(d) and condition 5 can just be overturned by the applicant to dictate to the newly set up ANCA – part of FCC to present a future CAO as being legal and acceptable.

13A2.9

FCC have been designated as the competent authority for the purposes of aircraft noise regulation at Dublin Airport by Section 3(1) of the Aircraft Noise (Dublin Airport) Regulations At 2019 .

The words of the ANCA Director Ethne Fenton.

There are a few misunderstandings about our function - primarily we are not deciders of whether planning permission for development is granted or refused to Dublin Airport "

The DAA , who are the managers of Dublin Airport pay for the running of the Authority"

This says it all – ANCA have no teeth in respect of the development and noise management of Dublin Airport - therefore just another organised body to get around the European Regulations. DAA will dictate the standards and regulations to the detriment of those most adversely affected. Once set up and passed, daa will be absolved of any responsibility for the health and well being of the runway victims. This will transfer to ANCA (paid by DAA) and IAA and ATC.

Therefore the needs and requirements of those directly affected must be addressed as part of this application now by ANCA and Fingal County Council at this juncture. Should this be granted by ANCA and FCC, this will be entrapment for those trapped in the flightpath Longitudinal corridor.

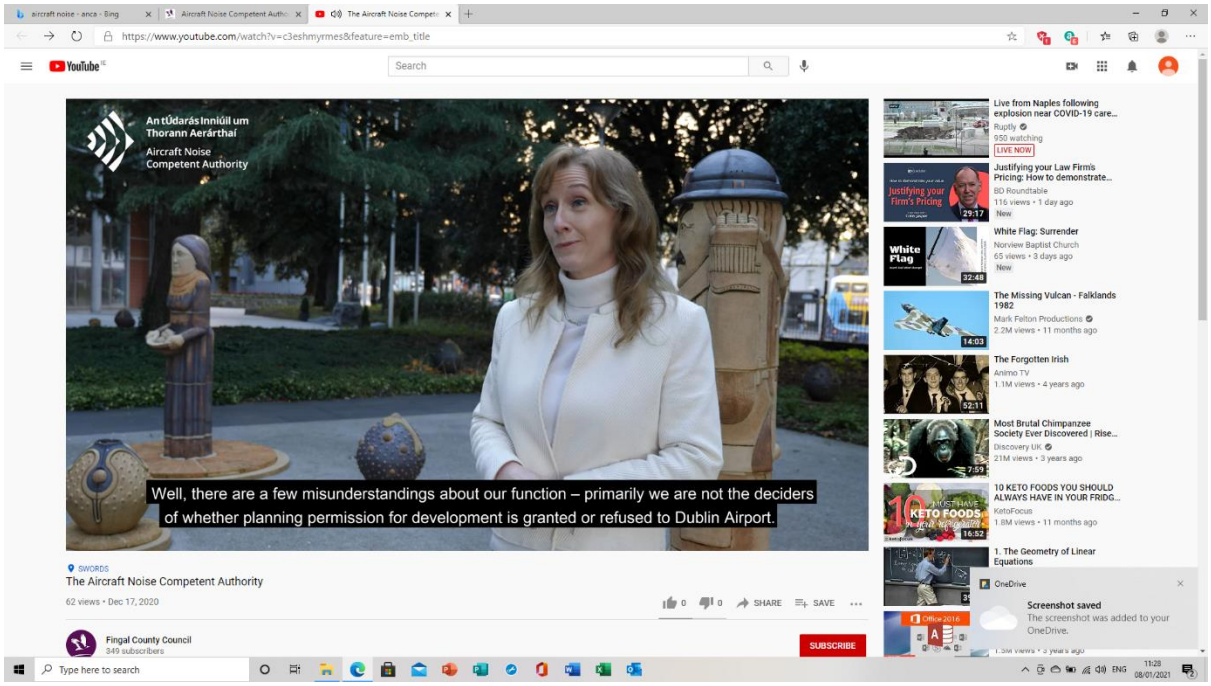
This legislation, the Aircraft Noise (Dublin Airport) Regulation Act 2019, allows for the airport to apply for a Relevant Action to amend, revoke or replace operating restrictions. The 2016 consultations made clear that daa would seek a review of Condition 3d and 5. The main focus of the consultations at that time was proposals on runway use and flight paths, and related effects (including noise) and mitigation measures.

The wording used is very important here - There conditions are being REMOVED

It must be noted DAA fund ANCA (Aircraft Noise Competent Authority) and ANCA do not have the power to grant or reject planning permission That is the role of Fingal County Council who benefit from 24% of their revenue from Dublin Airport. (per the planning report submitted)

This is confirmed from the words of the New Anca Director -Ethne Fenton , on the Fingal County Council Website.

> **" There are a few misunderstandings about our function - primarily we are not deciders of whether planning permission for development is granted or refused to Dublin Airport "**


An tÚdarás Inniúil um Thorann Aerárthaí
Aircraft Noise Competent Authority
Well, there are a few misunderstandings about our function – primarily we are not the deciders of whether planning permission for development is granted or refused to Dublin Airport.
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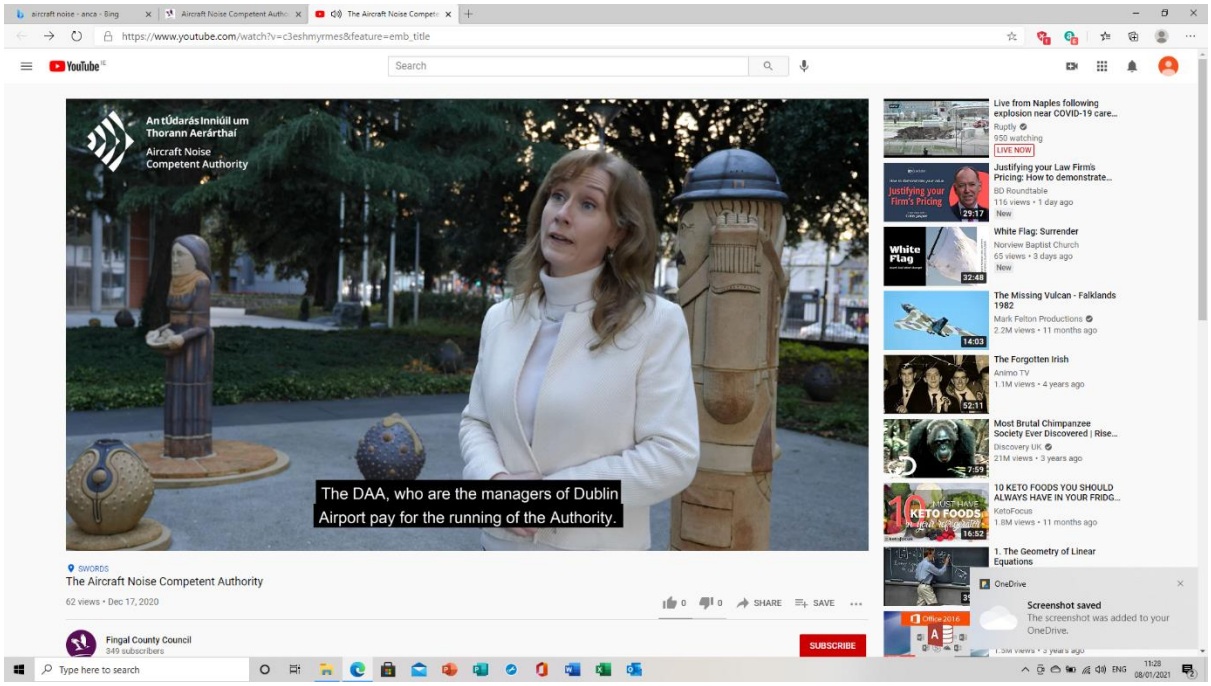
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The DAA , who are the managers of Dublin Airport pay for the running of the Authority"

It is DAA who are looking for this planning requesting ANCA to set up the NAO – with the data provided by DAA.

.

The setting up of ANCA – a prescriptive body under the payroll of Daa , gives no confidence to us , adversely affected , this body will not give a balanced approach to the noise problem this "RELEVANT ACTION is seeking for us, under the flight path and parallel to the runways. It will in reality give the airport operation full monopoly to do as they want and label us as irrelevant.

DAA have used this so called " Relevant Action " as part of the original planning permission to cover three issues.

1. Remove Conditions 3(d) and Condition 5.
2. As the paymaster, daa , direct ANCA in setting up the NAO per their perceived entitlement to remove the conditions , which is not part of the current grant of permission , with their proposals, assumptions , projections and leaving behind those also impacted in the current permission F04A/1755 that is active and in place.
3. Ensure the restriction that will be imposed, following the set up of the NAO will have the least number of restrictions for the operators at Dublin Airport going forward, with selected baselines. (2018 used instead of 2019 in their application)
4. Each Union Airport sets up its own NAP and NAO and report to the EU. – as part of the END. This is being directed by daa, funding ANCA and collaborating with FCC. This is a long term plan for the future and expected application in 2025 to exceed 32 million passengers and increase to 40MPPA. Where are the residents directly affected – in a Voluntary insulation scheme increased up to €20,000 as the figure of justification for losing night time sleep and health implications and no change to the Voluntary Buy out scheme. Dunbro is not part of the VDPS and was not part of the VDIS until pressurised into it. This demonstates the applicants view , that is of insignificance and irrelevance. The most affected residents must be part of

this decision, in relation to their future lives and health and not ignored. Therefore this consultation process must engage those adversely affected, and not merely have their concerns and health consequences ticked off as " considered" as is what has been the case over the last 50 years.

We appeal to ANCA to view the information received in this application , in its entirety and place yourselves in the kitchen of our homes , and balance the economic rationale with the human cost, to us, the loss of our control over our homes and our futures , should the removal of Condition 3(d) and 5 be permitted and a NAO put in place that ignores the true SEL – LAMAX that will bombard us night and day with longitudinal measurements not considered part of the noise maps as key. As the airport develops, the uncertainty of what is to come for adversely affected homeowners , creates an invisible daily stress to each person living in [redacted] and [redacted] and under the flightpath.

THE DUAL APPROACH TO SET UP A CNAO AS PART OF THIS APPLICATION.

The EIAR is really a quantity surveyors report to ANCA and FCC , with the entitled assumption that Condition 3(d) and Condition 5 to receive the expected grant of permission from ANCA and FCC. We witnessed this when FCC granted permission in 2004 for the original planning application for the runway. This was subsequently appealed to ABP. The detailed EIAR, which is a complex document , full of graphs, charts, assumptions and projections.

While the EIAR covers the current planning to a lesser degree, it focuses on the removal of the conditions 3(d) and 5 putting forward facts and figures to fall within the broad regulations under the EU Directive and the END.

So the micro affect on a small population becomes lost in the macro development plan- the destruction of the lives of health reduced to a statistic in the report – with a solution of VDPS or Insulation – not fit for purpose and does not go far enough.

The END (European Noise Directive) places the responsibility on each union airport to produce their own NAP and CAO as airports are all different. This gives freedom to each airport to compile the noise management and development , once the local authority and respective ANCA – Airport Noise Competent Authority are in agreement. ANCA are the competent authority to regulate and monitor aircraft noise as part of the balanced approach as part of the EU Noise Regulations . But if the scales is not calibrated to start with, there can be no balance for the residents under the flight path and between the runways.

This application has a dual approach , to remove Condition 3(d) and Condition 5 as if already in place, before the runway opens for operation, and set up the limited restrictions going forward to use for 24 hours a day.

As affected homeowners, we are fully aware of the daa strategy to use stepping and incremental planning applications to achieve a significant and potential devastating impact on Dunbro residents and flight path residents who will be adversely forever affected.

This subject is also covered in other chapters as it interacts with the Insulation and proposed VDPS put forward, and agreed by daa, FCC and now before ANCA to review. These should be rejected and homeowners individually spoken to and consulted in meaningful engagement with regards to the impact on them personally and for their futures. There is no " one size fits all" in this instance.

The planning of the expansion of Dublin Airport has been open ended, since the 1960's with FPDs and Planning Applications to FCC, with no terms of reference for the homeowners and this cannot be permitted in this application to continue, after the decision is reached. The issue of Flight path residents

and Dunbro should be dealt with as priority in this application, and not left open ended. We expect ANCA to recognise the fate and uncompromising position this places a small population of people in, for ever more.

FLIGHTPATHS

R**unway Usage.**

Table 3: Future Runway Usage Once the North Runway is constructed and operational Dublin Airport will operate during the daytime (07:00 – 23:00) in accordance with Conditions 3a-3c per the mode of operation Option 7b, as detailed in the Environmental Impact Statement Addendum, Section 16 as received by the planning authority on the 9th day of August, 2005.

This provides that:

(a) the parallel runways (10R-28L and 10L-28R) shall be used in preference to the cross runway, 16-34,

(b) when winds are westerly, Runway 28L shall be preferred for arriving aircraft. Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control, (c) when winds are easterly, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10R shall be preferred for departing aircraft, and except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports. In practice it is expected that, unless capacity requires mixed mode, the runways will operate in segregated mode during the day with arrivals using either Runway 10L or Runway 28L and departures using either Runway 10R or Runway 28R depending on wind direction. The few movements by Code F aircraft are an exception to this, as they will always use the North Runway. It is also proposed that departures by Category A & B aircraft heading south during westerly operations will use the South Runway, and those heading north during easterly operations will use the North Runway. A method of determining mixed mode runway usage on the main runways (North and South) for modelling purposes has been developed. The modelled runway usage has been determined on an hourly basis

Most of the time the runways will operate in segregated mode, i.e. one runway for all arrivals, the other for all departures.

However, there will be occasions during peak hours when runways will need to operate in mixed mode, i.e. both runways used simultaneously for arrivals and departures. The change from segregated to mixed mode and back to segregated mode will be determined by ATC

and once changed to a particular mode the airport is likely to operate in that mode for at least two hours.

Activity switches from segregated mode to mixed mode where activity is such that any of the three following single runway capacity limits are exceeded: 1. More than 35 arrivals in one hour. 2. More than 44 departures in one hour. 3. More than 48 movements (combined arrivals and departures) on one runway in one hour. In mixed mode, where each individual runway handles both arrivals and departures, departures will operate using the compass departure principle. This means that if a departure is using a route that turns to the north then the North Runway will be used, and conversely if it is using a route that turns to the south, the South Runway will be used. For westerly operations when in mixed mode as few arrivals as possible will use 28R, while not exceeding the single runway capacity limit of 48 combined arrivals and departures on runway 28L. For easterly operations when in mixed mode as few arrivals as possible will use 10R, while not exceeding the single runway capacity limit of 48 combined arrivals and departures on runway 10L.

When using the North Runway most aircraft will not use the full length on departure, and instead join the runway from the 1st intermediate taxiway. The exception are Code E and Code F aircraft, which will typically use the full runway length. All departures on the existing South Runway will use the full runway length. During the night-time period (23:00 – 07:00) for scenarios based on what is currently permitted the South Runway is the preferred runway.

It is worth noting the level of aircraft ATM envisaged on the two runways 35 arrivals and 44 departures in one hour, will then switch to segregated mode – that is 79 movement in 1 hour , 60 minutes – more than one every minute. Code F are the larger aircraft and will use the new North Runway – these will use the new flight path and subject residents under the flightpath to higher levels of SEL and Lamax.

Code F are the larger aircraft and therefore noisier with increased db levels - LAMAX and SEL.

Flight Paths

"Alternative flight path divergence were assessed, and these are included within the 'Alternative Processes – Chapter 4 Reasonable Alternative considered. - Aecom Non Tech. Summary EIA

- *Alternative flight paths : departing aircraft follow specific paths at take-off*

The Aircraft Noise Regulation 568 Assessment identified that the scenario with the lowest number of people exposed to change that potentially cause significant adverse effects caused by the change in noise levels is Scenario 2.

Lowest number of people exposed – that's us. For the residents of Dunbro and under the flight path ,will be subjected to significant adverse effects .

Scenario 2

06.00 – 23.59 When winds are westerly Runway28L shall be preferred for arriving aircraft. (coming in over Malahide, Portmarnock side) Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control. (taking off over St Margarets)

Again the lowest number of people exposed to westerly take off – which is the majority of the time - determined by ATC – US

When winds are easterly , either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. (Blowing from Malahide side) either runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft.

Runway 10L shall be preferred for departing aircraft

This means that most of the Aircraft take off will take place on 10L - flight path over St Margarets. We are the area identified with the lowest number of people exposed to change that potentially cause significant adverse effects caused by the change in noise levels

DAA are aware we are the minority and therefore it seems Ok to trample on homeowners with no direct meaningful and honest engagement. The mitigation solution put forward does not go far enough.

2.5 Flight Routes

2.5.1 Flight Routes – Current Airport Layout

For the main runway arriving aircraft have been modelled as using a continuous descent approach with a glide slope of 3 degrees. Based on an analysis of radar data in 2018, approaching aircraft are generally lined up with the extended centreline of the runway at least 17km from the runway threshold. Consequently the main runway approach routes have been modelled as straight out to this point. Before this point arrivals are modelled using 7 routes which cover the broad swathe of directions that the arriving aircraft approach from. The modelled current arrival routes are shown in pink on Figure DR033.

Category A & B Aircraft – Departures The IAA have stipulated that Category A & B aircraft, which are predominantly turboprops such as the ATR 72, are not required to remain within the existing environmental corridors to the same extent as the larger jet aircraft types. They therefore commonly turn off the extended runway centreline to the north or south shortly after the end of the runway. A review of radar tracks for recent activity has resulted in a set of routes for these aircraft types shown in red on Figure DR033.

We are those homes and households adversely affected by the runway take offs and landings on the new flightpaths associated with 10L-28R and also the current flightpaths and the associated noise and sleep disturbance this will bring. Not required to remain within the existing environmental corridors as the same extent as the larger jet aircraft types - SEL affect on sleeping households.

Category C & D Aircraft – Departures Currently the airport has a total of 11 Standard Instrument Departure (SID) routes for westerly operations and 10 for easterly operations, although in both cases a number are initially the same before separating some distance from the airport. As the point at which they separate is distant from Dublin Airport, the aircraft will have attained sufficient height to not cause significant noise disturbance on the ground by this point. Given this similarity, for noise modelling purposes a set of seven initial departure routes have been created from the western end and four initial departure routes from the eastern end. For departures during periods of easterly operations the INKUR and SUROX routes initially follow the ROTEV route until well beyond the extent of the noise contours, therefore all movements that head north west after their initial turn have been assigned to ROTEV, along with the movements that head north. Additionally the PELIG route is initially the same as the NEPOD route, therefore both PELIG and NEPOD movements have been assigned to NEPOD.

For Category C & D aircraft, which are jet engined aircraft, these routes have been supplemented for departures to the west by routes that turn earlier, although not as early as Category A & B aircraft routes. This assumption originally arose from a detailed study of radar data from 2010, which found that many of the larger aircraft on runway 28 actually performed their initial turn earlier than described by the SIDs. This is because after reaching an altitude of 3000 ft, they are vectored off by ATC. Two additional 'Early Turn' routes were therefore created for each route with initial turns to the north, south, or east, i.e. the ROTEV, NEPOD, LIFFY and DEXEN routes. Traffic has been distributed equally between the three turning points, the two early turns and the SID, for each route. Recent radar data has been reviewed and these assumptions are still considered to be appropriate for current activity at Dublin Airport.

The modelled current Category C & D routes are shown in blue on Figure DR033. This approach is in accordance with EU 2015/996 which states that "The backbone track defines

the centre of the swathe of tracks followed by aircraft using a particular routing. For the purposes of aircraft noise modelling it is defined either (i) by prescriptive operational data such as the instructions given to pilots in AIPs, or (ii) by statistical analysis of radar data as explained in Section 2.7.9 — when this is available and appropriate to the needs of the modelling study."

2.5.2 Flight Routes

70% of take offs will occur over St Margarets, with [redacted], Kilreesk experiences SEL and LAMAX levels of 80db to 90db as aircraft take off into the wind .

The winds are predominantly westerly around Dublin Airport.

The flightpaths of the runway come under the IAA (Irish Aviation Authority) and the ATC (Air Traffic Control)once operational, so therefore the daa can abdicate responsibility for aircraft noise and sleep disturbance, as is the current case with the current south runway, if these night time restrictions are removed.

North Runway Airport Layout

Aircraft have been modelled as approaching along a glide slope of 3 degrees. Arrival routes for the existing South Runway have been modelled the same as the current routes. Arrival routes have been created for the North Runway which broadly replicate those for the South Runway. The modelled arrival routes based on the future North Runway airport layout are shown on Figures DR034 and DR035.

Category A & B Aircraft – Departures Once the North Runway is in use Category A & B aircraft will continue to turn off the extended runway centreline shortly after the end of the runway, however they will not be allowed to turn across the other runway. A new set of departure routes has therefore been developed for Category A & B aircraft. From the southern runway this replicates the current routes, but with no turns to the north. For the North Runway the routes have been designed to replicate the current routes to a large extent but with no turns to the south as shown in Figures DR034 and DR035.

Category C & D Aircraft – (Jet Engines) Departures For Category C & D aircraft a number of the modelled routes have been used to represent more than one of the SIDs, so

combining the traffic on some of the SIDs onto a single modelled route. The departure routes to the west are supplemented by early turn routes, similar to the current routes. In order to achieve a safe minimum separation between flights from the two main runways, when both are in operation, departure routes have been used which include a course divergence of at least 15°. This means that the departure routes from the two main runways differ in course (head in different directions) by at least 15°. A set of departure routes from the North Runway has been developed, taking into account the resulting noise. The result is routes with an early turn to the north. When heading east all of the routes turn 15° at 1.06nm from the end of the runway. When heading to the west the routes to DEXEN, INKUR, NEPOD, PELIG and SUROX turn 30°, while those to ABBEY and ROTEV turn 75°, all at 1.18nm from the end of the runway. The departures on the South Runway continue along the extended runway centreline before turning. The modelled current Category C & D routes are shown in blue on Figures DR034 and DR035. This approach is in accordance with EU 2015/996 which states that **"In many cases is not possible to model flight paths on the basis of radar data — because the necessary resources are not available or because the scenario is a future one for which there are no relevant radar data. In the absence of radar data, or when its use is inappropriate, it is necessary to estimate the flight paths on the basis of operational guidance material**

Necessary resources are not available to model flight paths on the basis of radar data , the scenario is a future one - so assumptions made in this case which will adversely affect those between the runways and under the flight path. This is not acceptable, to base a CNAO on assumptions. The airport operators strategy – just do it and deal with the fall out later The residents will be expected to be the fall out and considered irrelevant.

2.5.3 Dispersion Aircraft on departure are allocated a route to follow. In practice, this route is not followed precisely by all aircraft allocated to this route. The actual pattern of departing aircraft is dispersed about the route's centreline. The degree of dispersion is normally a function of the distance travelled by an aircraft along the route after take-off and also on the form of the route. When considering many departures, it is commonly found that the spread of aircraft approximates to a "normal distribution" pattern, the shape or spread of which will vary with distance along the route. (Don't turn off until reaching 3000ft at least) - all the longitudinal SEL/ Lamax experienced by Dunbro, Millhead and Kilreesk.

2.5.4- Route Usage

The actual aircraft movement logs for years that have already occurred provide destination airports for each departure movement. This has been combined with an assessment that has been carried out of which departure route is used for each destination which utilise the direction it is from Dublin. The forecasts for future years generally include departure route

information for each movement, which has been used. Where departure route information is not available, a departure route has been assigned based on the destination airport.

2.7- AEDT Validation Results from the Dublin Airport Noise and Track Keeping (NTK) system have been used for noise validation purposes. Specifically, the results from Noise Monitoring Terminals (NMTs) 1, 2 and 20 between January and December 2018 have been used. The noise levels from the monitors are automatically correlated with aircraft movements using the radar track keeping system and the average determined by aircraft type and operation. A number of parameters are measured by the system, for this validation the Sound Exposure Level (SEL) of the individual aircraft movements has been used. To take into account the measured levels the AEDT software has been used to predict the level at the NMT locations using the recommended AEDT aircraft type. This has been compared to the measured averages for the aircraft types when separately arriving and departing. Where the differences between the measured and predicted results were found to be significant then adjustments were made to the modelling to minimise the differences. Seventeen aircraft have had modifications made to their arrival and departure noise assumptions. The modifications are detailed in Table 4 below.

Aircraft Type Arrivals Departures AEDT Type Adjustment (dB) AEDT Type Profile Adjustment (dB)

A306 A300-622R -3.1 A300-622R 30KFT +0.6 A319 A319-131 -1.4 A319-131 30KFT +0.9 A320 A320-211 -0.7 A320-211 USER -1.3 A320neo A320-211 -2.0 A320-211 USER -3.2 A321 A321-232 -0.4 A321-232 USER -0.5 A332 A330-301 -1.3 A330-301 30KFT -1.1 A333 A330-301 -1.1 A330-301 30KFT -0.8 ATR72 SD330 +1.5 SD330 STANDARD[2] +0.1 B734 737400 +0.4 737400 30KFT -0.1 B738 737800 -2.7 737800 USER -1.2 B738MAX

737800 USER -1.2 B738MAX 7878max -3.0 7378max USER -1.5 B752 757RR -0.4 757RR 30KFT -2.3 B772 777200 +0.2 777200 30KFT +1.5 B773 777300 -0.8 777300 30KFT -2.4 B787 7878R -0.3 7878R 30KFT +0.1 E190 EMB190 -0.8 EMB190 30KFT +0.5 RJ85 BAE146 -3.3 BAE146 STANDARD[2] -1.6 DH4[1] SD330 0 DHC6 STANDARD[2] 0 [1]

The issue for residents is the SEL noise levels experienced in close proximity of the flight paths which is overlooked and disregarded in the Planning report and not addressed appropriately .

The proposal of a noise quota system does not equate with actual noise from an aircraft and cannot be considered as like with like when you are woken from sleep or prevented for going to sleep. The data is generated from the aircraft manufacturers as a baseline. The issue for residents is the SEL noise levels experienced in close proximity of the flight paths which is overlooked and disregarded in the Planning report. The longitudinal noise levels will not be covered in the ANQ System.

An Bord Pleanála PLANNING AND DEVELOPMENT ACTS 2000 TO 2006 Fingal County Planning Register Reference Number: F04A/1755 An Bord Pleanála Reference Number: PL 06F.217429

Condition 3 and 5 clearly state:

3(d) Runway 10L-28R shall not be used for take-off or landing between 2300hours and 0700 hours, except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports.

(d) Runway 10L-28R shall not be used for take-off or landing between 2300 hours and 0700 hours, except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports.

Reason: In the interest of clarity and to ensure the operation of the runways in accordance with the mitigation measures set out in the Environmental Impact Statement in the interest of the protection of the amenities of the surrounding area.

The proposed " Relevant Action " removes this protection of the amenities of the surrounding area.

<u>Example of Response from daa following sleep disturbance – abdicating responsibility for the night time disturbance.</u>

The Environmental Corridor (noise preferential route) for departing aircraft using Runway 28 extends from the end of the runway in a straight line out to 5 nautical miles and has a height of 3,000ft. The corridor has a width of 180 metres at the runway end extending to 1,800m at 5 nautical miles. This means that an airliner departing Runway 28 must stay within the corridor until it achieves an altitude of 3,000ft. Once this altitude has been achieved aircraft may leave the corridor with the permission of air traffic control and route to their exit point from Irish Airspace.

Your complaint of the 21/07/2020 was the rescue helicopter and are involved in rescue missions 24/7 so don't fall under the normal environmental corridor restrictions.

The Irish Aviation Authority's Air Traffic Control Service makes the decision on what runway is to be used based on meteorological conditions at the time, usually wind direction and strength. For safety reasons aircraft must land and take off into the wind. Dublin Airport is licensed by the Irish Aviation Authority to operate twenty four hours a day and therefore there is no cut off time for flights using the airport.

All aircraft arriving and departing Dublin Airport come under the direction of the Irish Aviation Authority (IAA) who design the airspace, provide air traffic control services in Ireland and it is they who are responsible for the routing of aircraft. Nonetheless, we in Dublin Airport have regular meetings with the Irish Aviation Authority to continuously review the track keeping of aircraft in the vicinity of the airport.

Your complaints have been logged in our noise database. The reduction of aircraft noise on neighbouring communities is the joint responsibility of the airport authority, Irish Aviation Authority and the airlines that operate at Dublin Airport. I can assure you that we take concerns regarding aircraft noise very seriously and strive to do all we can to minimise any adverse impact on both the communities and the environment by the operation of Dublin Airport. In that regard we welcome all feedback concerning aircraft noise.

This response confirms the following;

- Dublin Airport is licensed by the Irish Aviation Authority to operate twenty four hours a day and therefore there is no cut off time for flights using the airport.

- All aircraft arriving and departing Dublin Airport come under the direction of the Irish Aviation Authority (IAA) who design the airspace, provide air traffic control services in Ireland and it is they who are responsible for the routing of aircraft

- So we then note the response:
- Nonetheless, we in Dublin Airport have regular meetings with the Irish Aviation Authority to continuously review the track keeping of aircraft in the vicinity of the airport.

- I can assure you that we take concerns regarding aircraft noise very seriously and strive to do all we can to minimise any adverse impact on both the communities and the environment by the operation of Dublin Airport. In that regard we welcome all feedback concerning aircraft noise.

Lately, the responses have been changed to " Dear Complainant " Our experience here in St Margarets, the issue of Aircraft noise is not of importance to daa. It is easy to spread and place the responsibility on other aviation and local authority bodies. We are considered insignificant. Our feedback is considered irrelevant.

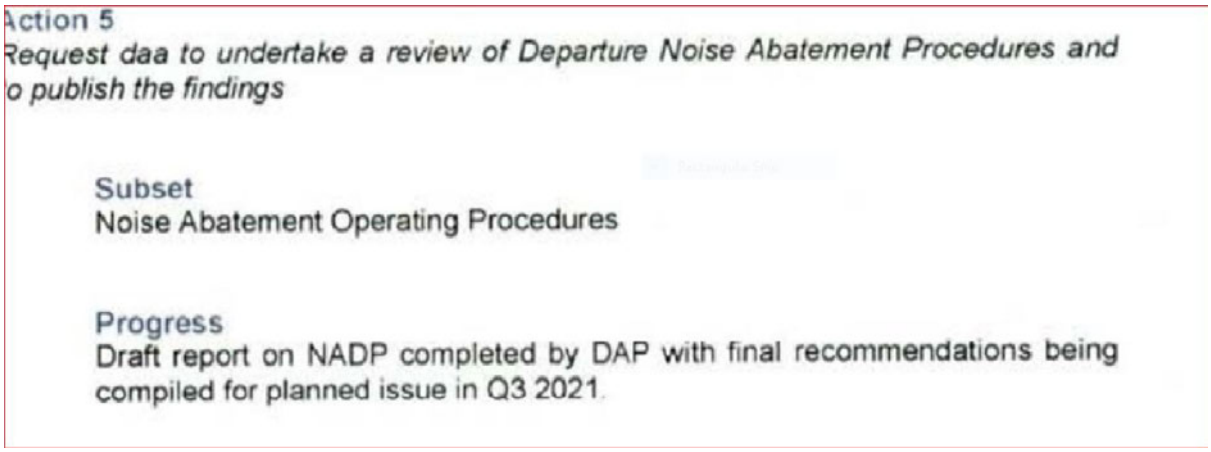
We have experienced this over the years where daa state responsibility for issues are for FCC and FCC state the responsibility for issues raised , are for DAA the Dublin Airport Operators. So since 2004, Daa and Fingal County Council have been one of the same body , responsible for ALL ISSUES raised by those impacted .

The reduction of aircraft noise on neighbouring communities is the joint responsibility of the DAA , airport authority, Irish Aviation Authority and the airlines that operate at Dublin Airport .

Joint responsibility does not work for residents, adversely affected in [redacted] and [redacted] under the flight path who are not given any priority in this grant of planning permission and proposed removal of condition 3(D) and condition 5. This is DAA's planning approval and the applicant should be made responsible for the health and well being of their closest neighbours, to adhere to the original conditions.

While the Inspector recommended refusal of planning for North Runway, in 2006, the Board however, acknowledged the impacts on the local residents and imposed the night time restrictions as a necessity to protect the residential households, under the flightpaths, in the interest of health and well-being. Night time per the WHO is 1100pm to 0700 am not 6am to 11pm.

Should this "Revelant Action " be granted to DAA the residents impacted in between the runways and under the flight path will be become permanently irrelevant . This will not be acceptable.



Action 5
Request daa to undertake a review of Departure Noise Abatement Procedures and to publish the findings

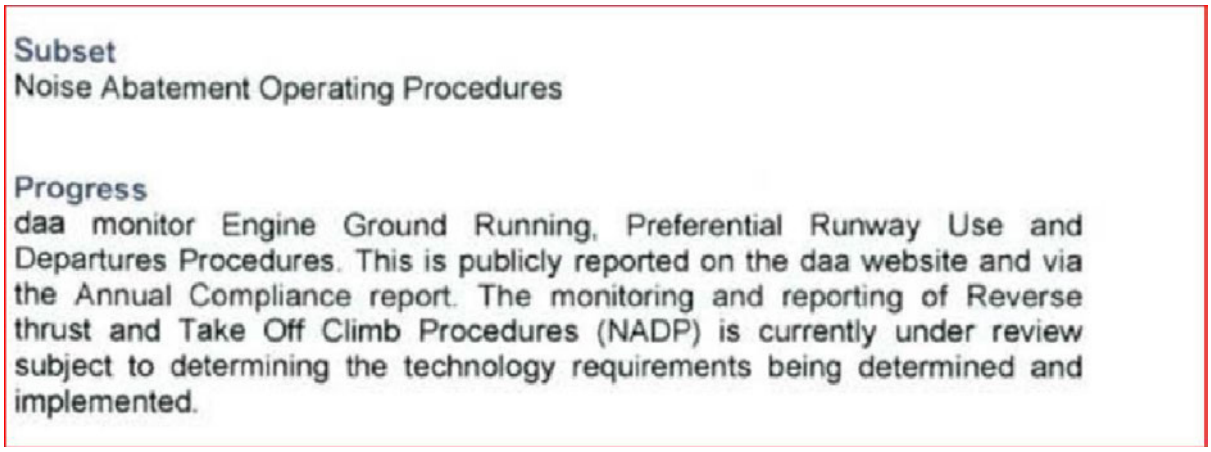
Subset
Noise Abatement Operating Procedures

Progress
Draft report on NADP completed by DAP with final recommendations being compiled for planned issue in Q3 2021.

Exrtracts from the Noise Action Plan 2018 – 2023.

Action 5 request daa to undertake a review of Departure Noise Abatement procedure and publish its findings – final recommendations due in Q3, 2021.

This is part of the NAP and details should be available to us, per the current planning permission as operations are at currently.



Subset
Noise Abatement Operating Procedures

Progress
daa monitor Engine Ground Running, Preferential Runway Use and Departures Procedures. This is publicly reported on the daa website and via the Annual Compliance report. The monitoring and reporting of Reverse thrust and Take Off Climb Procedures (NADP) is currently under review subject to determining the technology requirements being determined and implemented.

Again with the evidence of lack of priority for those on the ground beside the runways and under the flightpaths – as the noise contours as averaged out, to cover a wide area, and not specific locations.

Action 10
Engage proactively with communities through the Dublin Airport Environment Working Group (DAEWG) and the St. Margaret's Community Liaison Group

Subset
Monitoring & Community Engagement

Progress
Due to Covid restrictions, these community meetings now take place electronically. The DAEWG meets on a quarterly basis (March, June, September, and November), and CLG meets bimonthly (February, April, May, July, September, and December). In addition, special briefings relating to specific issues of interest to local communities also take place. When easement of restrictions permit, Dublin Airport's bimonthly drop-in clinics at local venues will resume, but in the interim, ongoing engagement continues via our dedicated freephone and email.

There has been no face to face meetings , since before Covid. In the interim, December 2020, the applicant lodged their application to remove the night time restrictions and change the planning permission . The residents and their representative are conveniently shut out, to permit the applicant to proceed , with no meaningful engagement in place now or from the lodging of the original planning F04A/1755 in 2004. Emails, on line data and zoom meetings are not accepted forms of consultation when the impact will be life changing for those directly affected.

Subset
Monitoring & Community Engagement

Progress
Noise contours produced for 2018 and 2019. This information will be made publicly available via the daa website. Ongoing annual Noise reports will be completed.

THE NOISE CONTOURS CANNOT BE RELIED UPON WITH 15 DIFFERENT NOISE MEASUREMENT METRICS USED IN THE EIAR. EACH ONE HAS A SPECIFIC MEANING AND CAN BE USED OR NOT USED IN PRODUCING NOISE CONTOURS.

Noise contours are a factual tool based on computer based predictions of noise generation involving various variables including numbers of movements, mix of aircraft types, patterns of runway usage and flight paths.

If any of these variables are changed, then the contours will change.

The Noise Zones represented on the Fingal Development Plan are purely a development control tool designed to minimise conflicts between airport operations and new developments. They are based on a scenario of mixed use of both east-west runways. A different scenario would generate different contours

THIS IS THE EXPLANATION WE RECEIVED FROM DAA ON THE LODGEMENT OF THE PLANNING APPLICATION F04A/1755

A FACTURAL BASED TOOL , PREDICTIONS INVOLVING VARIOUS VARIABLES, INCLUDING NUMBER OF ATMS, MIX OF AIRCRAFT AND PATTERNS OF RUNWAY USAGE AND FLIGHT PATHS .

PURELY A DEVELOPMENT TOOL DESIGNED TO MINIMISE CONFLICTS BETWEEN AIRPORT OPERATORS AND NEW DEVELOPMENTS .

So it is quite clear the contours are based on data input into the computers and produces a result best suited to the needs of the operator and misleading in terms of what the human ear hears at 2am in the morning or 5.45 am or 11.45 pm when attempting to sleep. Our Aircraft Acoustic Engineer, Karl Searson, proved at the oral hearing the contours did not include the SEL and Lamax the fast and slow constants. This was the reason the Board of ABP inserted the night time restrictions, due to the missing data by daa, in additional information in 2006. Daa only received the grant of permission, subject to the night time restrictions, in the interest of the closely affected residents health and well-being for night time sleep and down time. Daa assume the entitlement to leave all the other conditions as is and change condition 3(d) and 5 as a continuation and open ended planning permission, to achieve their commercial goal. This tramples on the lives and rights of those victimised living parallel and in the flight paths of the runways.

In the words of Housing Minister Darragh O Brien on the Defective Concrete issue for homes in Donegal, he stated the scheme put in place would permit the Donegal homeowners to " *Rebuild their homes and more importantly rebuild their lives - People can move on with their lives"*

Since the 1960's the people of St Margarets have been held captive by daa, with uncertainty, and now with the planning application, where does this place those most affected.

Action 11
Promote the enhancement of the Noise Flight Track System to include where appropriate additional fixed and/or mobile noise monitoring terminals

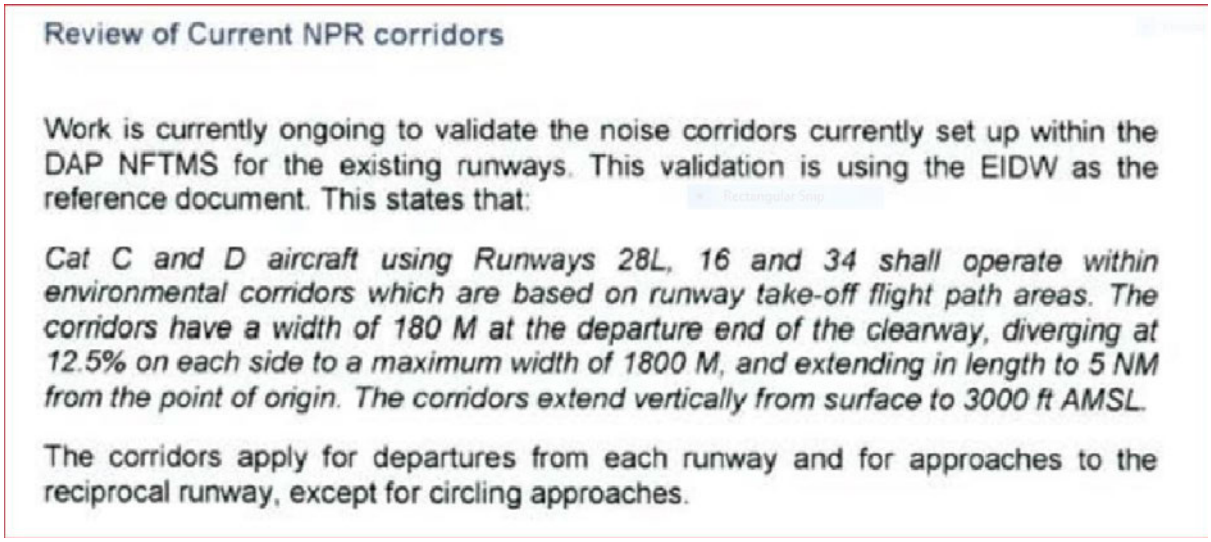
Subset
Monitoring & Community Engagement

Progress
daa are currently in the process of completing a Noise Flight Track Monitoring System upgrade to ANOMS. Expected completion by 3/5/21 with additional capabilities to be brought online over the short to medium term. A Noise Monitoring Terminal expansion that accounts for the Northern Runway is currently being developed based on the Departure and Arrival paths for the new runway (SIDS & STARS). Expected completion of the study and commencement of placement is expected before end of 2021.

Extract from the NAP states that the Noise Flight Track Monitoring System will be upgraded and this has occurred. We cannot be confident that the factual and correct information is available to the viewer and those adversely impacted. This has already been proved in relation to a call to DAA aircraft noise line, test flight overflying the North Runway , on 16th October 2021, at approx. 01.15 am which was denied by DAA , and then removed from the radar reports . It was subsequently confirmed thereafter in their response letter, dated 28th October 2021.

The fact the a Noise Monitoring Terminal Expansion that accounts for the Northern Runway was expected to be completed before end of 2021 and in place, based on the departure and arrival paths for the new runway . This time line is conveniently very close to the results of the 2 month consultation process and the issue of reviewing it for affected

residents . Also the noise monitoring expansion has not been put in place . There are no noise monitors in Dunbro, at date of writing this submission.



Review of Current NPR corridors

Work is currently ongoing to validate the noise corridors currently set up within the DAP NFTMS for the existing runways. This validation is using the EIDW as the reference document. This states that:

Cat C and D aircraft using Runways 28L, 16 and 34 shall operate within environmental corridors which are based on runway take-off flight path areas. The corridors have a width of 180 M at the departure end of the clearway, diverging at 12.5% on each side to a maximum width of 1800 M, and extending in length to 5 NM from the point of origin. The corridors extend vertically from surface to 3000 ft AMSL.

The corridors apply for departures from each runway and for approaches to the reciprocal runway, except for circling approaches.

Flight Track Monitoring for new runway with options and preferences put forward by daa's consultants. This was the first time the true impact of aircraft and take off and landings would impose upon [redacted], and Kilreesk with consultants indicating levels of 80-90db . There was significant inconsistancies with the noise experts present - with contours v LDEN and Lmax over our homes. It was stated by the experts the sound insulation will not work.

At a special CLG meeting in the Maldron Hotel on 10th November 2016,

DAA with FCC presented their duel VDPS and VDIS which was the first time , we were informed of its formation and content.

DAA and FCC utilised this meeting to present their final details , agreed and formulated by DAA and FCC to sign off on Conditions 7 and Conditions 9 on the VDPS and VDIS.

Following up on the Flight Paths meeting with their options and preferences, we requested the Longitudinal data, to align with what the noise consultants had said on 25th October, and this was not available.

This was continuously requested at the CLG meetings and denied and only presented to the Secretary and Chair of SMCRG on 31st October , 2018 .

RFI 119 - CDA Monitoring

Introduction to CDA

CDA refers to Continuous Descent Approach – this is a method of aircraft approach used by airlines operating at airports that is designed to minimize the environmental impact of arrival operations. Operations are in violation of this procedure when they fly distances of level flight that exceed the criteria, on approach to the airport.

Dublin Airport is currently in the process of reviewing and validating the criteria to facilitate CDA monitoring and have implemented CDA rules in line with international best practice into ANOMS. A trial period of implementation will be completed over Q2-Q3 2021 that will advise engagement with relevant stakeholders and interested parties ahead of implementation.

As the EIAR and additional information was lodged in September , this information needs to be added so that ANCA can fully assess the facts , and the real impact on flight path residents. in relation to the operation of the runways - 16hrs a day and for 65 ATMS on the South Runway.

The annual compliance report in relation to

Engine Ground Running

Preferential runway use

Departure Procedures

This Annual Compliance report should be presented to every directly affected homeowner in layman's terms to explain the true impacts on their daily lives, 24 hours a day, going forward. It is not enough to have an annual compliance report , published and then responsibility to those affected absolved.

CDA Rules to be applied for trial period

Operations are deemed to have incurred a CDA violation when they fly more than 1 segment of level flight on approach to the airport. In the UK, at the three South East Airports, Heathrow, Gatwick, and Stansted, ANOMS has been used to measure CDA since circa 2005. The image below shows a copy, in the Dublin system, of the rules used in the three airports. Pending review and validation of the rules the trial period detailed above will be implemented with these limits and thresholds. The CDA rules will be applied to all runway approaches with the intent to provide high level overall and individual runway compliance levels. Adjustment over the trial period may be required to facilitate operational constraints.

The trial period of implementation will be completed over Q2 and Q3 2021 that will advise engagement with relevant stakeholders and interested parties ahead of implementation.

What are the results in layman's terms and who will be advised of engagement. Are we considered relevant ?

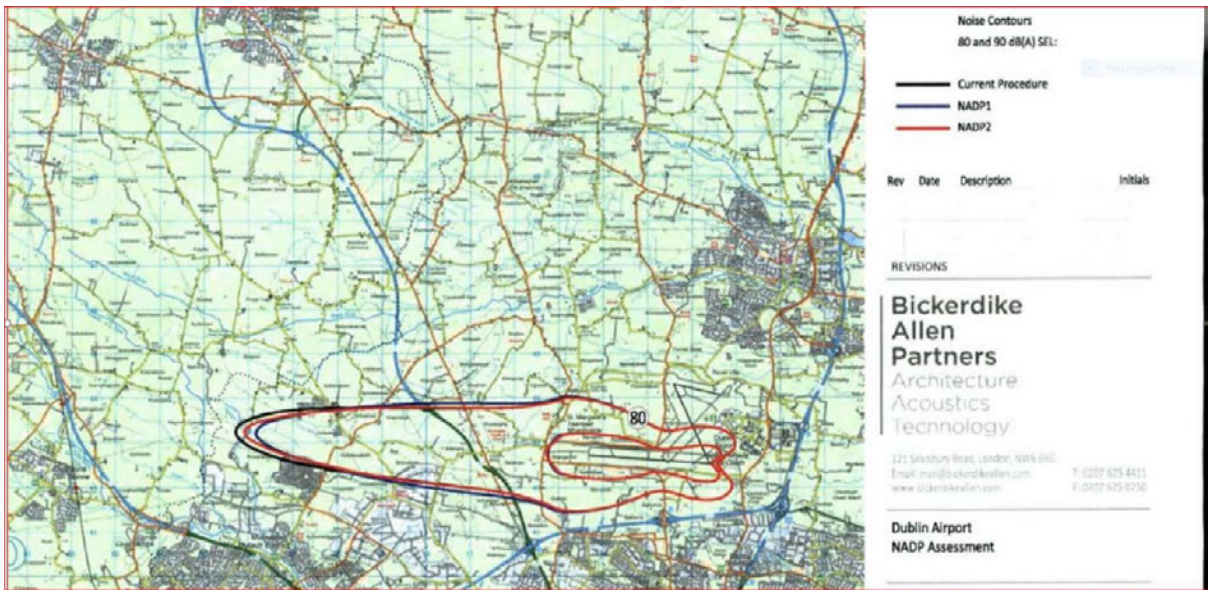
Monitoring and reporting of

NAPD - Reverse Thrust and Take off Climb procedures currently under review – subject to determining the technology requirements being determined and implements .

This is very vague and conveniently under review. Can we see the results of these procedures and what is envisaged for residents parallel to the runway and in the 3000ft flight path.

The ANOMS system will process all arrival operations for the airport against the proposed CDA rules detailed above to determine if a CDA has occurred. Details will be stored within the ANOMS database, from where the relevant metrics and reports can be generated to advise aviation stakeholder engagement following the trial period completion. Agreed rules will only be applied to ANOMS following this stakeholder engagement for all current operational runway approaches and North Runway.

This should be explained in simple details to our impacted residents. It is too technical in nature to understand for the ordinary resident. The result will be following the trial period. Where to the affected home owners fit in on this final process agreed.



A320 Aircraft. – SEL 80 db and 90DB Departure Runway 28L – NADP Assessment.

Flight Routes – Current Situation

13B.3.28 For the Crosswind Runway straight arrival routes have been used with a set of modelled departure routes for Category A & B and Category C & D aircraft, which have been developed based on the published SIDs.

13B.3.29 For the South Runway, based on an analysis of radar data in 2018, approaching aircraft are generally lined up with the extended centreline of the runway at least 17 km from the runway threshold. Consequently, the South Runway approach routes have been modelled as straight out to this point. Before this point arrivals are modelled using 7 routes which cover the broad swathe of directions that the arriving aircraft approach from. Flights have been equally distributed between the 7 routes. The modelled current arrival routes are shown in pink on Figure 13B-2.

13B.3.30 For departures on the South Runway, the current routes used vary with aircraft type and destination.

We note there are 7 routes that cover the broad swathe of directions that the arriving aircraft approach from. Flights have been equally distributed between the 7 routes.

3B.3.31 Category A & B aircraft, which are predominantly turboprops such as the ATR 72, are not required by the IAA to remain within the existing environmental corridors to the same extent as the larger jet aircraft types. They therefore commonly turn off the extended runway centreline to the north or south shortly after the end of the runway. A review of radar tracks for recent activity has resulted in a set of routes for these aircraft types shown in red on Figure 13B-2.

3B.3.32 Currently the airport has a total of 11 Standard Instrument Departure (SID) routes for westerly operations and 10 for easterly operations, although in both cases a number are initially the same until after they have left the study area. Given this similarity, for noise modelling purposes a set of seven initial departure routes have been created from the western end and four initial departure routes from the eastern end. Table 13B-14 shows which route has been used to model each SID and gives the initial direction of the routes.

Table 13B-14: Departure Routes Used to Model SIDs

SID	Modelled Route		Initial Direction
	Westerly Operations	Easterly Operations	
BAMLI	ROTEV	ROTEV	North
BEPAN	NEPOD	NEPOD	South
DEXEN	DEXEN	DEXEN	East
INKUR	INKUR	ROTEV	West
LIFFY	LIFFY	LIFFY	East
OLONO	NEPOD	NEPOD	South
PELIG[1]	PELIG	-	West
PESIT	NEPOD	NEPOD	South
NEVRI	ROTEV	ROTEV	North
ROTEV	ROTEV	ROTEV	North
SUROX	SUROX	ROTEV	North

[1] Westerly Operations Only

So how do these impact on us residents – what is the real time impact . Obviously each SID will impact the take off noise level and is it possible to forecast the SIDs that will be used? Is it the IAA that determine which take off SID is used , or is it dependant on route .

13B.3.33 For Category C & D aircraft, which are jet engined aircraft, these routes have been supplemented for departures to the west by routes that turn earlier, although not as early as Category A & B aircraft routes. This assumption originally arose from a detailed review of 2010 radar data and has been confirmed as remaining appropriate by a review of recent radar data. These reviews found that many of the Category C & D on runway 28 actually performed their initial turn earlier than described by the SIDs. This is because after reaching an altitude of 3000 ft, they are vectored off by ATC. Two additional 'Early Turn' routes were therefore created for each route with initial turns to the north, south, or east, i.e. the ROTEV, NEPOD, LIFFY and DEXEN routes. Traffic has been distributed equally between the three turning points, i.e. the two early turns and the SID, for each route.

13B.3.34 The modelled current Category C & D routes are shown in blue on Figure 13B-2.

A and B Category are turboprops are not required to stay in the flight corridor, in the way jet engine aircraft are. – This Category of aircraft are exempt , for noise related nuisance per the daa in their responses at present. Nonetheless, it must be highlighted that turboprops do fly

low over [redacted] and Kilreesk and the nuisance noise is very real , particularly at night. So the aircraft noise is a real issue.

C & D are jet engine aircraft. C and D on runway 28 performed their initial turn earlier that described by the SIDs Standard Instrument departure.

13B.3.37 Once the North Runway is in use Category A & B aircraft will continue to turn off the extended runway centreline shortly after the end of the runway, however they will not be allowed to turn across the other runway, i.e. they cannot turn north off the South Runway and vice versa. A new set of departure routes has therefore been developed for Category A & B aircraft. From the South Runway this replicates the current routes, but with no turns to the north. For the North Runway the routes have been designed to replicate the current routes as closely as possible but with no turns to the south as shown in Figures 13B-3 and 13B-4.

13B.3.38 For Category C & D aircraft a number of the modelled routes have been used to represent more than one of the SIDs, so combining the traffic on some of the SIDs onto a single modelled route. The departure routes to the west are supplemented by early turn routes, similar to the current routes.

13B.3.39 In order to achieve a safe minimum separation between departures and arrivals performing a go around and based on public consultation and a subsequent detailed safety assessment by the Air Traffic Service Provider, a course divergence of at least 30° is required. As the runways are parallel this necessitated an early turn by departures from the North Runway.

13B.3.40 An analysis was undertaken to determine the best initial turn angles taking into account the resulting noise, and the local community was consulted on the options. The analysis concluded that that for departures to the west there were limited differences between the various turn angle options, but an initial turn or 15° or 30° to the north was favourable in terms of the overall numbers of sensitive receptors under the flight path. This was supplemented with a 75° initial turn for departures heading to the north or west off the North Runway in westerly departures. For departures to the east an initial turn of 15° to the north was the most favourable option. The public consultation resulted in the 15°/75° divergence to the west off North Runway and 15° to the east going forward for further analysis.

When was this consultation conducted with the local community, what local community. This only meeting to present the preferred and options was on 25th October 2016 to St Margarets Residents and there was no preferred routes – all residents were going to be in excess of >80db due to our location. We were informed that Insulation would not mitigate the Lamax noise.

What does that look like initial turn or 15 or 30degrees to the north was favourable in term of the overall numbers of sensitive receptors under the flight path. The public consultation resulted in 15/75 degrees divergence to the west off North Runway and 15degrees to the east going forward for further analysis.

13B.3.41 The subsequent detailed airspace design indicated that a course divergence of at least 30° was required for westerly departures in order to allow for safety requirements associated with potential missed approaches or go arounds. The final set of divergence was therefore selected to be 30° and 75° to the west and 15° to the east.

13B.3.42 A set of departure routes from the North Runway was then developed that replicated the current routes as closely as possible, while allowing for these initial turns. The result is routes with an early turn to the north. When heading east all of the routes turn 15° at 1.06nm from the end of the runway. When heading to the west the routes to DEXEN, INKUR, NEPOD, PELIG and SUROX turn 30°, while those to ABBEY and ROTEV turn 75°, all at 1.18nm from the end of the runway.

13B.3.43 The departures on the South Runway continue along the extended runway centreline before turning.

13B.3.44 The modelled current Category C & D routes are shown in blue on Figures 13B-3 and 13B-4.

13B.3.45 This approach is in accordance with EU Directive 2015/996 which states that "In many cases is not possible to model flight paths on the basis of radar data — because the necessary resources are not available or because the scenario is a future one for which there are no relevant radar data. In the absence of radar data, or when its use is inappropriate, it is necessary to estimate the flight paths on the basis of operational guidance material".

The approach is in accordance with EU Directive 2015/996 which states that "In many cases is not possible to model flight paths on the basis of radar data – because the necessary resources are not available. So the scenarios are a future one which there is no relevant data. This validates why condition 3(d) and condition 5 should stay in place, per the planning permission from ABP in August 2007.

Dispersion

13B.3.46 Aircraft on departure are allocated a route to follow. In practice, this route is not followed precisely by all aircraft allocated to this route. The actual pattern of departing aircraft is dispersed about the route's centreline. The degree of dispersion is normally a function of the distance travelled by an aircraft along the route after take-off and also on the form of the route.

13B.3.47 When considering many departures, it is commonly found that the spread of aircraft approximates to a "normal distribution" pattern, the shape or spread of which will vary with distance along the route. A simplified mathematical model can be adopted to represent a normal distribution of events, based on standard deviations. EU Directive 2015/996 advises the use of seven "dispersed" tracks associated with each departure route, these comprise the Centreline of each route and the three Sub Tracks either side.

13B.3.48 The allocation of movements to each track for this assessment was as follows:

- 28.2% of departures along the Centreline;
- 22.2% of departures along each of the two inner Sub Tracks either side of the Centreline and offset by a distance of 0.71 standard deviation;
- 10.6% of departures along each of the 2nd pair of Sub Tracks either side of the Centreline and offset by a distance of 1.43 standard deviation;
- 3.1% of departures along each of the two outer Sub Tracks either side of the Centreline and offset by a distance of 2.14 standard deviations.

13B.3.49 This dispersion model has been applied with a departure offset profile, which comprises the standard deviations of the magnitude of the dispersion for lengths of straight and curved track. These have been determined from a detailed analysis of radar tracks for operations in 2016 at Dublin. Operations in 2018 have been reviewed and found to follow a similar distribution.

13B.3.45 This approach is in accordance with EU Directive 2015/996 which states that "In many cases is not possible to model flight paths on the basis of radar data — because the necessary resources are not available or because the scenario is a future one for which there are no relevant radar data. In the absence of radar data, or when its use is inappropriate, it is necessary to estimate the flight paths on the basis of operational guidance material".

Note: In accordance with EU Directive 2015/996 which states that it is not possible to model flight paths on the basis of radar data, because the necessary resources are not available or because the scenario is a future one for which there are no relevant radar data. So in the absence or when its use is inappropriate , it is necessary to estimate the flight paths on the basis of operational guidance material.

So we see here – estimated, projected, assumptions – which create noise contours that cannot be relied upon and will be subject to change , once the new runway is operational. In the meantime, the adversely affected residents are expected to accept this data and also ANCA to make a decision and input into a NAO. This is not real time information that can be validated.

13B.3.65 This is in line with EU Directive 2015/996, which requires that "All input values affecting the emission level of a source, including the position of the source, shall be determined with at least the accuracy corresponding to an uncertainty of ± 2dB(A) in the emission level of the source".

Performance of Modernised Aircraft Types

13B.3.66 For the recently introduced and future aircraft types in the forecasts which are not contained within the AEDT model, assumptions have been made for their expected noise levels. This is based on a comparison with either the current generation aircraft that is being directly replaced, or the most similar aircraft type available in AEDT.

13B.3.67 The expected changes in noise levels are primarily based on a comparison of average certification noise levels between the current and modernised aircraft types from the *EASA Approved Noise Levels database*[3] undertaken in 2019. A summary of these is given in Table 13B-16. For aircraft whose certification noise levels were not available the assumptions are based on those used by the ERCD for the Airports Commission (2014)[4].

Table 13B-16: Summary of Entries in EASA Database for Relevant Aircraft Types

Aircraft Type	# Entries in EASA Database	Average of EASA Noise Certification Levels (EPNdB)		
		Lateral	Flyover	Approach
737700	1206	93.3	83.2	95.8
Airbus A321	1757	96.0	86.6	96.5
Airbus A321neo	561	88.7	84.1	94.5
Airbus A330-300	811	98.3	91.1	98.4
Airbus A330-900neo	5	92.4	88.9	98.4
Airbus A350-900	40	91.0	85.0	96.5
Bombardier CS300	16	87.1	80.8	92.4
Embraer E190	89	92.3	84.0	92.5
Embraer E190-E2	30	86.1	76.8	91.4

13B.3.68 For arrivals the approach level was utilised. For departures the average of the lateral and flyover levels was utilised. For each modernised aircraft type where an assumption was needed, the arrival and departure noise levels were separately compared with the relevant current aircraft type. These differences were then added to the adjustments set out in Table 13B-15 to give the resultant adjustments presented in Table 13B-17.

13B.3.68 For arrivals the approach level was utilised. For departures the average of the lateral and flyover levels was utilised. For each modernised aircraft type where an assumption was needed, the arrival and departure noise levels were separately compared with the relevant current aircraft type. These differences were then added to the adjustments set out in Table 13B-15 to give the resultant adjustments presented in Table 13B-17.

Table 13B-17: Expected Change in Noise Levels between Current and Modernised Aircraft Types

Current Aircraft Type	Modernised Aircraft Type	Expected Change in Noise Levels between Current and Modernised Aircraft Types (dB)	
		Arrival	Departure
737700	Bombardier CS300	-3.4	-4.3
Airbus A321	Airbus A321neo	-2.4	-5.4
Airbus A321	Airbus A321LR[1]	-2.4	-5.4
Airbus A330-300	Airbus A330-900neo	-1.1	-4.8
Airbus A330-300	Airbus A350-900	-3.0	-7.5
Boeing 777-300	Boeing 777X[2]	-0.8	-3.8
Embraer E190	Embraer E190-E2	-1.9	-6.2

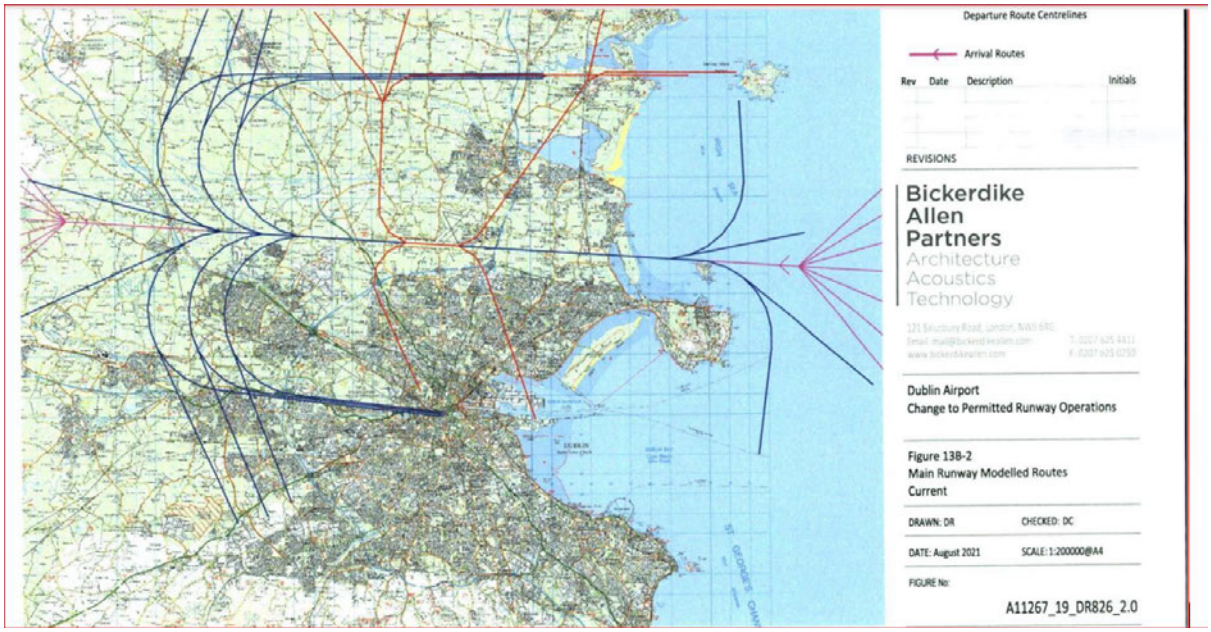
[1] Based on A321neo certification noise levels
[2] Based on ERCD assumptions

The db level at night per the conditions, will have dB level of zero for scheduled flights as no ATMs are permitted between 1100 – 0700 am .

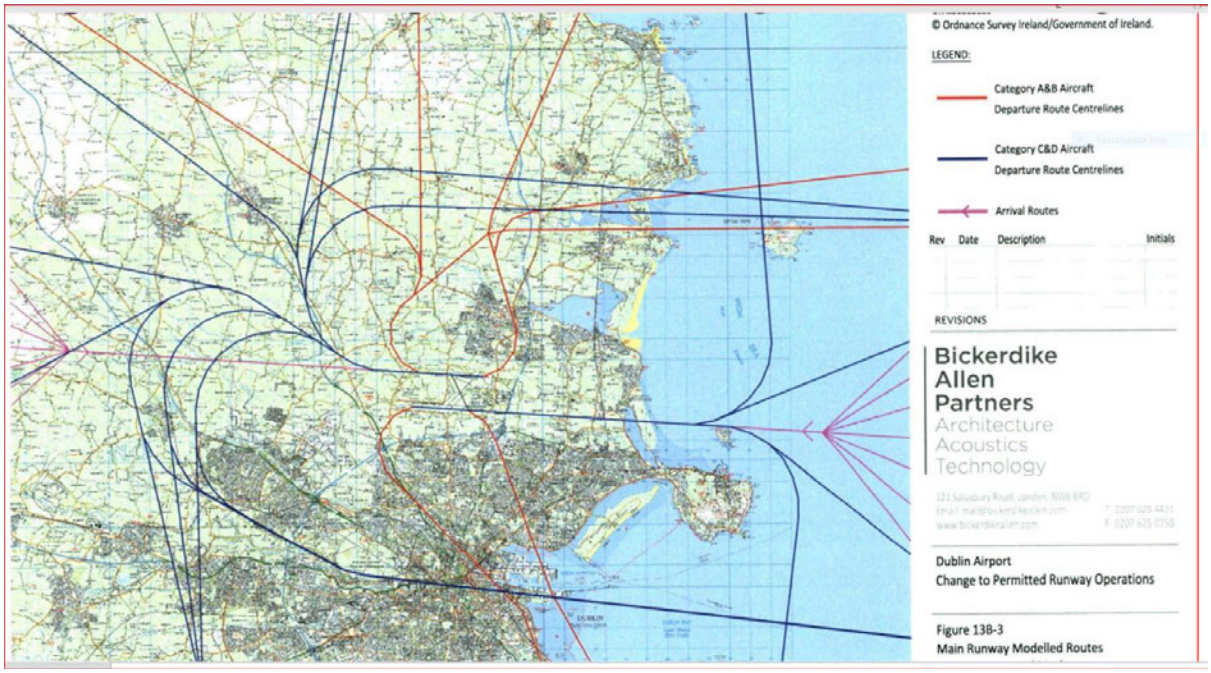
The reduction in aircraft noise is welcomed for the 16 hour operation on both runways and the 65 ATMS only at night on the South runway.

Noise prediction

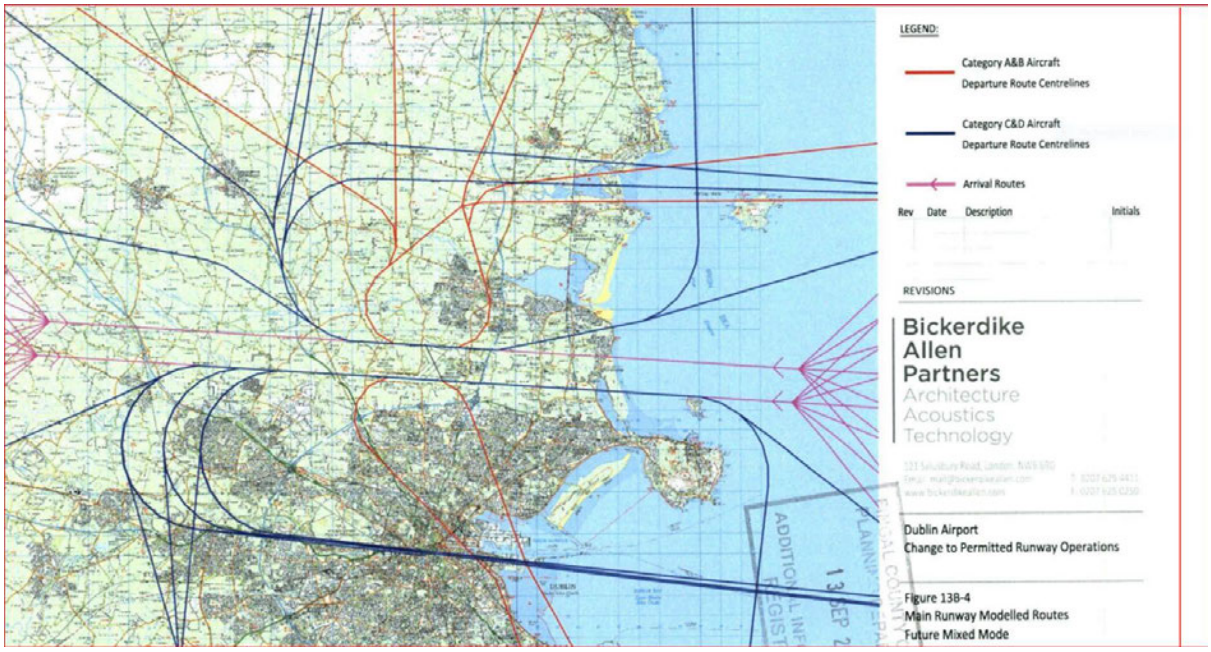
13B.4.6 Each dwelling and community building has been included in the AEDT model as a receptor. A representative set of receptors has been created for each permitted development and zoned land area based on site plans and other publicly available information. Noise levels have been predicted at each of these receptor locations.



This is the current routes for take off and landing aircraft – August 2021



Change to permitted runway operations. – North and South runways. Centre line over [redacted] and right hand side of Kilreesk Lane.



Change to permitted runway operations – future mixed mode.

For those under the flight of the runway, in St Margarets , it would appear from the data put forward none of the data will make any real difference , as we look at the Longitudinal data finally received on 28th October, 2018.

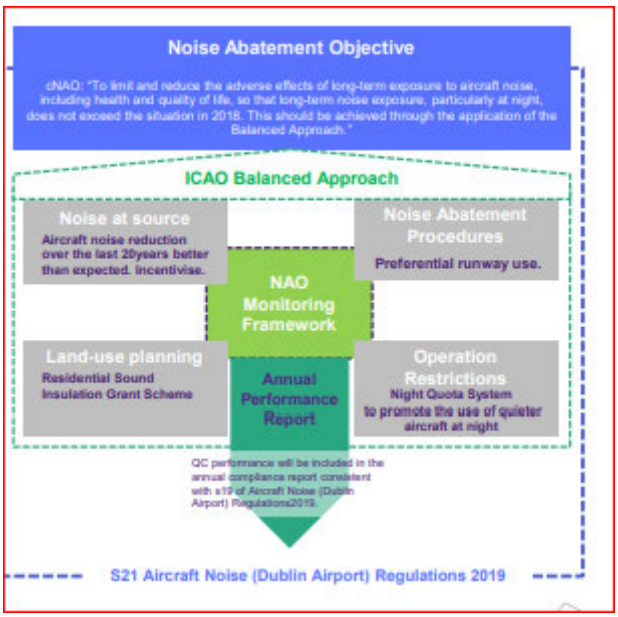
The following refers to [redacted] Kilreesk Lane and out to the Ward.

And the corresponding Lamax and SEL levels.

The fact that daa withheld this information, and agreed a VDPS and VDIS with FCC , with full knowledge of the impact of the North Runway and its flight paths, without our meaningful participation, highlights how the DAA view our position in our community and our homes. These night time restrictions cannot be permitted, on the basis of the above. Daa expect those adversely affected to be forced out of their homes by default under their " voluntary scheme" which is not considered by the homes affected as voluntary, by the nature of its content.

Health Impacts

Aircraft Quota System proposed as mitigation tool for NAO – Balanced Approach.



The applicant is proposing to use the Aircraft Quota System as part of their mitigation process , along with the above.

To replace Condition no. 5

On completion of construction of the runway hereby permitted, the average number of night time aircraft movements at the airport shall not exceed 65/night (between 2300 hours and 0700 hours) when measured over the 92 day modelling period as set out in the reply to the further information request received by An Bord Pleanála on the 5 th day of March, 2007

Reason: To control the frequency of night flights at the airport so as to protect residential amenity having regard to the information submitted concerning future night time use of the existing parallel runway

TO: *A noise quote system is proposed for night time noise at the airport . The airport shall be subject to an annual noise quota of 7990 between the hrs of 2330 and 0600 hrs.*

ANCA have granted the total of 16,260 Aircraft Quota counts, an increase of 7,990 as part of their DRD.

This application is about four different and separate airport issues.

1. Removing the night time tranquillity required for sleep and rest, imposed by ABP in 2007 with disregard for the WHO guidelines.
2. Introducing the flight paths as part of the runway – this should be a separate planning application.
3. Precursor to application for increasing passenger numbers from 32million to 40 million in 2025. This was originally part of the discussions with FCC and ANCA to be included in this application, but was deferred until 2025, when passenger numbers are due to be at peak again and in anticipation of this planning approval.

4. Introduction of the Noise Quota System instead of ATMs at Dublin Airport. Dublin Airport has no restrictions currently. The operation of the new runway brings into place restrictions for the first time . The NQS is a matter for each airport to implement under the NAO and daa have proposed a cNAO to ANCA to agree upon, when in actual fact, there is no NAO in place and is a requirement to do so by ANCA without the night time restrictions in place per the planning permission document. Daa have proposed this AQS would be reviewed every five years by ANCA and FCC – when there is a limit of a 6 months season placed on QC points, and this is at the discretion of the airport operator, how they are assigned. The AQS is not designed for those under the flightpath or parallel to the runways, as it does not consider the number of SEL's envisaged to cause sleep depravation and health issues.

   Please refer to Condition 10 on the planning conditions – F04A/1755 – PL06F.217429 where it states:

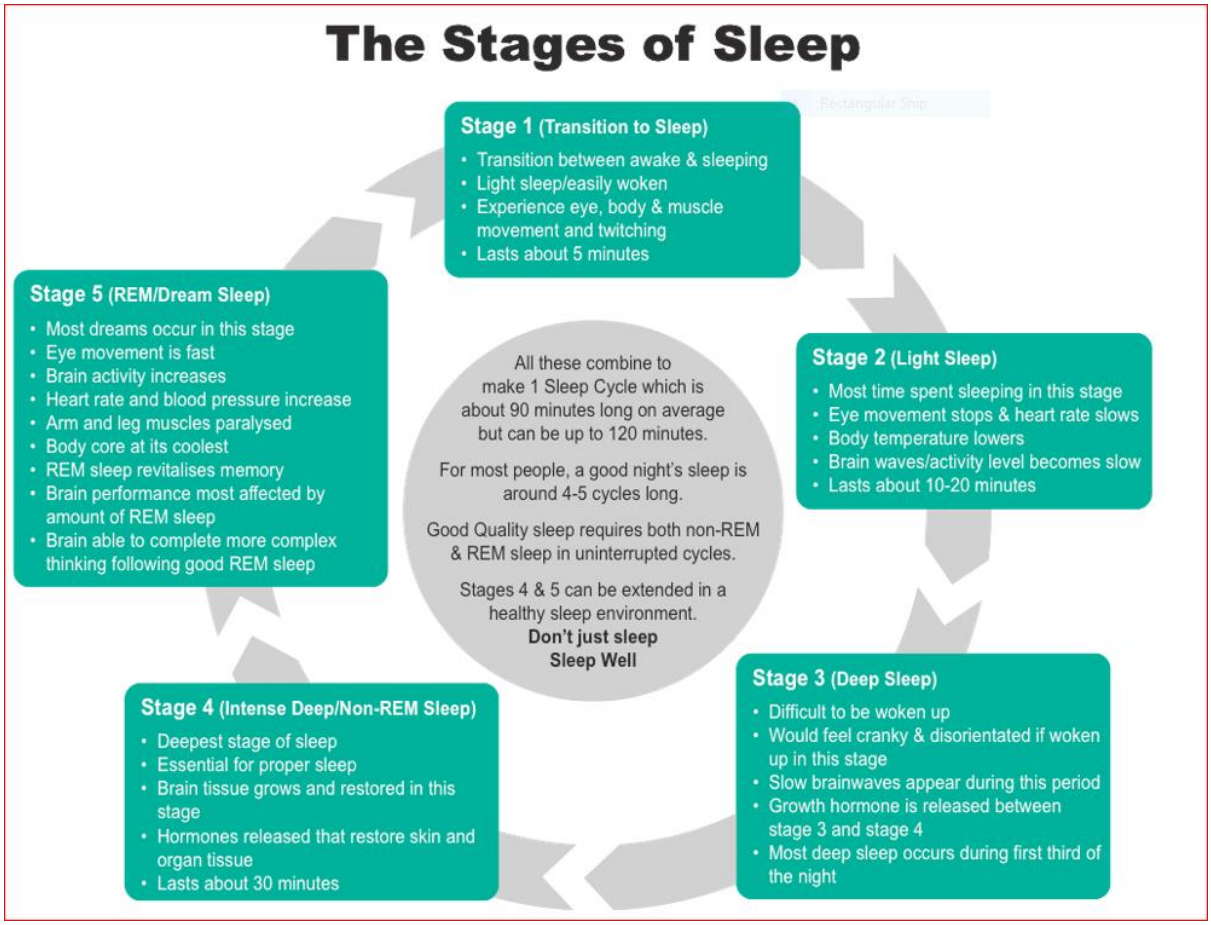
   A noise and flight track monitoring report shall be submitted to the planning authority on a quarterly basis and shall be made available for public inspection. The results of the noise and flight track monitoring shall be used to re-evaluate noise impacts and the application of mitigation measures, including (a) the Noise Insulation Scheme (including residents and schools) and (b) the property buy out scheme bi-annually.

   Reason: To protect the amenities of the area and to ensure ongoing monitoring and verification of the proposed noise mitigation measures.

An extreme example put forward by the AEF (Aircraft Environmental Federation – UK)
One Concorde on departure has the same equivalent noise energy to 120 Boeing 757's taking off every 2 minutes for 3 hours and 58 minutes.
The Concorde noise energy lasts for 2 minutes

   .

   3 hours disturbed sleep instead of 1 large aircraft with a 2 minutes disturbance.



The EIAR and Submission F20A/0668

The full documentation covers many subjects ranging from the economic need, to the operations at night and day – 24 hours x 365 days , to aircraft noise and the mitigation proposals of the aircraft quota system, to operate for the unforeseeable future of Dublin Airport. Also the Candidate Noise Abatement Objective proposals to include the land use management – agreed on by FCC and the Noise Quota System in place, for ANCA to agree with, prior to FCC making a decision on this legally invalid planning application in Irish line with the EU598/2014 Directive. The EU598 directive was only brought into Irish legislation on 29th May 2019 with the President of Ireland signing off on the Aircraft Noise Regulation Act 2019 . Prior to that a NAP (Noise Action Plan) was passed in January 2019 that will overlap with the opening of the new runway , due to expire in quarter 2023.

Also in the mix is the Voluntary insulation and Voluntary home buy out scheme, (VDPS) which is already part of the planning conditions, with very ambiguous wording , conveniently open to interpretation of the applicant and FCC. This was agreed to , without the meaningful consultation with the adversely affected homeowners, under the new flightpath , placing a gun to their heads. So we see the current conditions being used for a new planning application to breach the health safeguards imposed on the airport operators, daa by ABP in August 2007.

The conditions relating to the School and home insultation and the home buy out were part of the Laeq16hr metrics used in the original planning, F04/1755 in 2004 – 2006.

AIRCRAFT NOISE

Page 38 of Volume 4 – Inspectors report. –from the Oral Hearing 2007.

Mr. K. Searson (Disc 2 – 09/10/06 Submission BB and BB1) detailed noise measurements taken at a number of homes of persons in St. Margaret's Concerned Residents Group. He raised issues relating to the further information submitted in response to the Board's request, the INM model and use of fast and slow time weighting. The prediction package is incapable of predicting arrival LAF,max levels at, or close to any of the appellants' properties. Reliance on this prediction method means that it is not known how many decibels will need to be attenuated. Any buy-out of properties should take into account the creeping background levels which the expansion of the airport has caused to date. Modern up to the minute acoustical engineering criteria and radical thinking needs to be employed.

Mr. Searson answered questions on the noise measurements he undertook and the WHO document to which he referred (1995 document). He confirmed that the properties at which he took the measurements did not receive insulation from the original scheme. Mr. Searson stated that the SEL and LAeq are not affected by fast or slow. To get a reduction by 1 or 2 decibels would be relatively easy however it gets progressively more difficult in getting a further reduction. He confirmed that the phrase 'creeping background' is used in a conventional sense and not with reference to LA90 levels
Mr. Walsh answered questions on his submission including clarification of how frequency of flights at night would not affect LAmax levels and stated that the LAeq and A weighting is not ideal for aircraft noise and stated that the D or E scale would more accurately reflect human perception. He also clarified that he referred to the 2000 WHO document.

Page 41 of 60 – Vol. 4 inspectors report.

Questions to Planning Authority Mr. Flanagan stated that Mr. O'Kelly's review of both the proposal and the planning authority's assessment of the issue of noise is independent and unsolicited. He stated that by reason of the documentation submitted to the planning authority, further information and clarification of further information it is the Council's understanding that Option 7B is the preferred use of the runways. Conditions 5 and 7(c) reflect this preferred option. In terms of engine testing the Council feels constrained by its commitment in the LAP and a cautious approach to be taken to engine testing. Therefore it would still recommend its removal from the northern part of the site prior to commencement of development. It is accepted that some form of criterion is appropriate in terms of night time use of the runway and that the planning authority's decision is not explicit in this regard. Mr. O'Kelly's recommendations for an LAeq 1hr. 55dBA level are

considered practical. Mr. O'Kelly stated that the EIS quotes SEL levels. The LAmax is assessed under fast time constant. He accepted that the LA f max would give higher readings than the LA s max for a given variable trace and that it is possible that there could be deviations between the two of between 3 and 5 dB. He accepts that the INM uses the LA s max but doesn't apply to the SEL from which the LAeq contours are derived. He accepts that the British Standard and WHO Guidelines recommend that the fast time constant be used for LAmax. Mr. O'Kelly stated that ISO 1996, which advocates the A weighting and the LAeq being the best descriptor for environmental noise, was voted and accepted by 27 countries including Ireland. The LAmax may supplement it. He does not necessarily accept that the LAmax is a more likely descriptor for sleep disturbance. Mr. O'Kelly notes that the measured levels at monitoring station 20 are considerably lower than the predicted levels. He also gave details as to the location of the monitor in Portmarnock. He accepted that it is relatively close to the DART station. The issue of independent monitoring was raised. He accepted the computations provided by the applicant as satisfactory. Mr. O'Kelly accepts that it is possible that inside bedroom levels of over 45dB LAeq could be recorded at night at properties of the St Margaret's Concerned Residents Group. While it would be desirable to have it lower such comparable levels prevail for 1000's of properties. He stated that the NRA Guidelines for the construction of new roads sets a Lden of 60dBA and note that in many cases this may not always be attainable. It is a design goal. Mr. O'Kelly stated that the INM model is considered to be one of the best in the world. It is automatically calibrated 4 times a day. He would reject Sharps Redmore's recommendation that the measurement be treated with caution. Actual noise measurements are being taken at 7 locations. Mr. O'Kelly stated that it would be desirable that noise levels be monitored at particular schools. He accepted that windows and ventilations units in schools must be treated properly. He accepted that a baseline study is useful but that the contour for 2003 is useful. Mr. Walsh noted that could be a difference of +/- 1 km for a 1dB difference. Mr. O'Kelly would like to see night-time flights limited. He considered that there would be difficulties having an absolute night curfew at the entire airport. He confirmed that night-time is seen as 11.00 – 7.00 and not 11.00 – 6.00 as written. He stated that the conditions attached to the grant of permission should be clear and that operational use of the proposed runway as outlined in Option 7B should be explicitly stated. Mr. O'Kelly is not aware of the number of deviations from flight paths and he confirmed that he did not look at St.Margaret's in terms of flight deviations.

Dr. Hogan (Submission BJ) gave details of the health impact assessment carried out. He stated that there is no risk of noise induced hearing loss due to aircraft outside the airport. He also addressed the issues of interference with speech communication, conversation, sleep disturbance, health impacts including mental health, effects on residential behaviour and annoyance and impact on schools. Noise insulation of schools within the 60dB contour is recommended. He concluded that in terms of the health effect of environmental noise there is some limited evidence of effects on blood pressure, cardiovascular risk, school performance, mental health and sleep disturbance. Many effects are only demonstrated with ambient noise in excess of 70dB. Given the number of residences within this contour the effect is negligible. There are few, if any, residences exposed to these noise levels and therefore the human health impact of noise from the proposed facility is assessed as negligible. Dr. Hogan also commented on the submissions made by Dr. Staines and Prof. Stansfeld on behalf of the Portmarnock Community Association. He stated that there is

enormous common ground between a Health Impact Assessment and an EIS. The assessment of health effects cannot be performed by medical people alone. There would be input from noise and air experts, toxicologists etc., all of whom had input into the EIS.

Flight path residents will experience non restricted flights from 7am – 11pm on both runways when the new runway becomes operational with non use permitted on the new runway for 8 hours 11pm - 7am and reduction to 65 movements (includes both take-offs and landings in this figure) when the new runway opens – to permit rest and sleep in the *interests of human health.*

DAA fully agreed with this, and then submitted an application to squash these night time restrictions in August 2008 under SID (Strategic Infrastructure Development) which was refused (See documents attached from ABP file)

PER THE WHO (WORLD HEALTH ORGANISATION) - NIGHT TIME IS CLEARLY DEFINED AS 1100 TO 0700 - 8 HOURS.

DAA never intended to abide by this permission, and have cherry picked what they don't like and expect residents to abide in full. This demonstrates the view of DAA towards those adversely affected , deeming them insignificant, and trampling on them, with the power of entitlement, using the tools of planning and legislation, tailor made to suit all their requirements. (Variation No 1 to the FDP – December 2019) .

At the Oral Hearing in 2006 Mr Kelly stated the INM which derived the noise contours used (Laeq 16 hour) was based on the Las max (slow) which gives lower readings. **Compared to the Laf max (Fast) this gives a different reading 3-5db higher. So the applicant used the metrics giving a more favorable result for the creation of their contours used at the Oral** Hearing.

Night time hours - is 11pm - to 7 am - and the introduction of a AQC (Aircraft Quota Count) does not change that fact. To overturn the conditions – and replace with an Aircraft quota count system tramples on the residents directly affected with other so called mitigation measures already agreed by Fingal County Council, excluding most of those impacted. This effectively removes the two conditions, not replaces them.

Aircraft Quota System may have a plausible argument, that aircraft will become quieter in the next 5 years, but this QC will allow more ATMs, and therefore no benefit to flightpath residents and those parallel to the runways. It is the manufacturers who certify the QC on their aircraft. So this raises many questions:

So who will independently verify the valid QC count to compare with Laf max levels?

Will this be done and how will this be done?

What happens if an airline / aircraft goes over their quota? Will there be sanctions , and penalites for airlines who breach their limits as encouragement does not guarantee compliance.

What happens in this case?

Will Airlines/ aircraft be prohibited from using Dublin Airport.

There are currently 9 cargo aircraft operating schedule at Dublin Airport. Cargo Aircraft tend to be older and noisier aircraft.

Are there any penalties for airlines, cargo carriers for breaching the count?

Where is the process and procedures in this scenario ?

Where is the independent and balanced approach for residents?

This is what ANCA have to consider – and this should be prior to any CAO as part of the balanced approach .

The NAP report has been a written report with facts and figures and does not reflect the true impact , as single events on those adversely affected. This is produced by daa to FCC and now , will be reviewed by ANCA – part of Fingal County Council.

DAA produce the data- DAA are the managers of the airport – A CNAO framework proposed to be set up by ANCA - DAA fund ANCA - ANCA are part of Fingal County Council – despite the aspiration , that both are independent. We as residents see this all part of DAA and there is no independent Aircraft Noise Competent Authority for the health and well being of those trapped in the Longitudinal Corridor. There is no balance for Residents.

R**unway Usage.**

Table 3: Future Runway Usage Once the North Runway is constructed and operational Dublin Airport will operate during the daytime (07:00 – 23:00) in accordance with Conditions 3a-3c per the mode of operation Option 7b, as detailed in the Environmental Impact Statement Addendum, Section 16 as received by the planning authority on the 9th day of August, 2005.

This provides that:

(a) the parallel runways (10R-28L and 10L-28R) shall be used in preference to the cross runway, 16-34,

(b) when winds are westerly, Runway 28L shall be preferred for arriving aircraft. Either Runway 28L or 28R shall be used for departing aircraft as determined by air traffic control, (c) when winds are easterly, either Runway 10L or 10R as determined by air traffic control shall be preferred for arriving aircraft. Runway 10R shall be preferred for departing aircraft, and except in cases of safety, maintenance considerations, exceptional air traffic conditions, adverse weather, technical faults in air traffic control systems or declared emergencies at other airports. In practice it is expected that, unless capacity requires mixed mode, the runways will operate in segregated mode during the day with arrivals using either Runway 10L or Runway 28L and departures using either Runway 10R or Runway 28R depending on wind direction. The few movements by Code F aircraft are an exception to this, as they will always use the North Runway. It is also proposed that departures by Category A & B aircraft heading south during westerly operations will use the South Runway, and those heading north during easterly operations will use the North Runway. A method of determining mixed mode runway usage on the main runways (North and South) for modelling purposes has been developed. The modelled runway usage has been determined on an hourly basis

Most of the time the runways will operate in segregated mode, i.e. one runway for all arrivals, the other for all departures.

However, there will be occasions during peak hours when runways will need to operate in mixed mode, i.e. both runways used simultaneously for arrivals and departures. The change from segregated to mixed mode and back to segregated mode will be determined by ATC and once changed to a particular mode the airport is likely to operate in that mode for at least two hours.

Activity switches from segregated mode to mixed mode where activity is such that any of the three following single runway capacity limits are exceeded: 1. More than 35 arrivals in one hour. 2. More than 44 departures in one hour. 3. More than 48 movements (combined arrivals and departures) on one runway in one hour. In mixed mode, where each individual runway handles both arrivals and departures, departures will operate using the compass departure principle. This means that if a departure is using a route that turns to the north then the North Runway will be used, and conversely if it is using a route that turns to the south, the South Runway will be used. For westerly operations when in mixed mode as few arrivals as possible will use 28R, while not exceeding the single runway capacity limit of 48 combined arrivals and departures on runway 28L. For easterly operations when in mixed mode as few arrivals as possible will use 10R, while not exceeding the single runway capacity limit of 48 combined arrivals and departures on runway 10L.

When using the North Runway most aircraft will not use the full length on departure, and instead join the runway from the 1st intermediate taxiway. The exception are Code E and Code F aircraft, which will typically use the full runway length. All departures on the existing South Runway will use the full runway length. During the night-time period (23:00 – 07:00) for scenarios based on what is currently permitted the South Runway is the preferred runway.

It is worth noting the level of aircraft ATM envisaged on the two runways 35 arrivals and 44 departures in one hour, will then switch to segregated mode – that is 79 movement in 1 hour , 60 minutes – more than one every minute. Code F are the larger aircraft and will use the new North Runway – these will use the new flight path and subject residents under the flightpath to higher levels of SEL and Laf max (fast constant)

Code F are the larger aircraft and therefore noisier with increased db levels - LAF - MAX and SEL.

A noise quote system is proposed for night time noise at the airport . The airport shall be subject to an annual noise quota of 7990 between the hrs of 2330 and 0600 hrs.

Now INCREASED TO 16,260 in ANCA's DRD.

October, 2005

A briefing was prepared for MPs by the AEF on the 'Night Noise Quota Count Scheme'. The briefing was prepared in connection with the Civil Aviation Bill in Oct 05, but is of general relevance to the night flights issue.

(Aircraft Environmental Federation)

Summary

The Night Noise Quota Scheme professes to be a regime that will encourage the uptake of quieter aircraft but its numerous shortcomings **in fact allow far more planes to fly at night, while maintaining the same supposed 'noise climate'.**

While these planes may indeed be marginally quieter**, it is the number of noise events, rather than a token reduction of a few decibels, that causes the misery of sleep deprivation to residents living under flight paths. It is essential, therefore, that the cap on numbers of movements at night is retained.**

Although the Bill [Civil Aviation Bill] as currently worded merely enables the Secretary of State to set a limit based on noise rather than movements, given the strong business lobby for a quota-only system AEF **suspects it will only be a matter of time before the movements limit is abolished altogether.**

Explanation

The Scheme rates all aircraft types according to their respective noisiness of landing and and take-off using a measure called EPNdB 'effective perceived noise' in decibels. Band of EPNdB are assigned a Quota Count (QC) rating, this being done on an exponential scale.

For each reduction of 3 in EPNdB the QC is halved:
EPNdB over 101.9 is QC/16
EPNdB 99 – 101.9 is QC/8
EPNdB 96 – 98.9 is QC/4
EPNdB 93 – 95-9 is QC/2
EPNdB 90 – 92.9 is QC/1
EPNdB less than 90 is QC/0.5
EPNdB less than 87 is exempt (ie QC of zero).

A limit is placed on the total number of QC points per 6 month season (how these are assigned per night is at the discretion of the airport operator). Thus under a pure quota count system, if planes rated at 96 EPNdB were replaced with planes rated at 95 EPNdB, twice as many could be flown during the restricted period.

The environmental objective is to keep within a given 'average noise' limit for the whole night, measured in Leq. Leq stands for Level equivalent and is calculated by adding together the noise energy of all the noise events across a given time period and then taking the continuous level (ie. it irons out the peaks and troughs).

An extreme case will illustrate the way Leq works. One concorde on departure had equivalent noise energy to 120 Boeing 757s – so one [Boeing 757] plane every 2 minutes for 4 hours, produced the same Leq as 2 mins of concorde followed by 3 hrs 58 mins of silence.

There is no official noise index for showing night noise in the UK (although Leq is officially recognised during the day period between 0700 and 2300). However, the Government believes that producing 'noise maps' for airports at night using Leq contours is an adequate way of expressing aircraft noise, and has produced maps for the London airports in its recent consultation on the night noise regime.

This method is an inadequate as a way of assessing the impact of a small number of noisy events distributed over a long and otherwise tranquil period. This is explicity stated by the World Health Organisation in their guidelines for noise levels:

"*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. However, when there are distinct events to the noise, as with aircraft or railway noise, measures of individual events such as the maximum noise level (LA Max) or the weighted sound exposure level (SEL) should also be obtained in addition to LAeq,T."*)[NB: 'LAeq,T' is simply a fuller description of 'Leq' – the 'A' indicating the weighting scale used and T specifying the time period] (WHO Guidelines for Community Noise, Executive Summary, p2.)

As planes get marginally quieter many more will be allowed to fly at night under a pure quota count scheme. But it is the frequency of noise events that can ruin a night's sleep. If I am woken up by all noise events over 90 dB, I will not be pleased to hear twice as many, even if they are 92 dB rather than 95 dB. **Hence it is essential that a numbers limit on night movements is retained.**

Other problems with the QC system:

It is misleading to equate a 3dB reduction with a halving of 'annoyance', even for the individual event. EPNdB is a measure of 'noise energy' and it is by no means certain that a halving of noise energy results in a halving of noise heard by the human ear, despite the name.

Research over many years has show that halving the noise energy, ie reducing the noise level 3dB, by no means halves the perceived noise. The ear detects it only as a slight reduction**. For noise to sound half as loud, the noise level must be reduced by about 10dB.**

It is because the perceived loudness is not proportional to noise energy that the 'logarithmic' scale of decibels was introduced into the science of acoustics.

QCs are assigned according to certified rather than actual measured noise. There is evidence that actual practices are often noisier – sometimes one whole QC band noisier. DfT applies a reduction on arrival noise by 9 EPNdB. This has some justification given the way noise is certified, but it **fails to account for the different quality of noise and the different set of people affected by departures. It has the effect of artificially lowering the QC of arrivals – and most of the movements at night are arrivals.**

A fuller explanation, with reference to the most recent change in quotas at Heathrow, Gatwick and Stansted is given on the DfT web site. While this is informative and factually correct, it does not (of course) explain the flaws inherent in the system.

Take note of extract from the above – which demonstrates our point of incremental change to get over this hurdle of removing the night time restrictions.

This method is an inadequate as a way of assessing the impact of a small number of noisy events distributed over a long and otherwise tranquil period. This is explicity stated by the World Health Organisation in their guidelines for noise levels:

"*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. However, when there are distinct events to the noise, as with aircraft or railway noise, measures of individual events such as the maximum noise level (LA Max) or the weighted sound exposure level (SEL) should also be obtained in addition to LAeq,T."*)[NB: 'LAeq,T' is simply a fuller description of 'Leq' – the 'A' indicating the

weighting scale used and T specifying the time period] (WHO Guidelines for Community Noise, Executive Summary, p2.)

Ref: AEF 2005 report (Aircraft Environmental Federation (UK).

2. ANCA RFIs

Request No.	Document Reference	Request
1	EIAR Chapter 1 - It appears that the noise quota count does not apply for the 1.5 hours of shoulder period.	The Applicant is requested to clarify why the noise quota count does not apply for the periods 23:00-23:30 and 06:00-07:00.
Response: *Please refer to Dublin Airport Developing a Proposed Annual Night Quota (Appendix A).*		

The applicant refers to Section 4 for discussion.

The Noise Quota System is designed to limit the overall amount of noise produced by aircraft using an airport based on the Noise Quota Allowance for a given time period.

There is a restriction in place on runway 10L -28R with NO scheduled night flights between 2100 and 0700 per the planning permission F04A/1755 as defined in a legal planning document in August 2007 by ABP following an intense Oral hearing by residents from St Margarets and Portmarnock. (SMCRG and UPROAR)

DAA proposals are based on the system currently in operation at the UK London Airports

Why UK airports and no European airports such as Schipol , Berlin, Frankfurt – European airports - UK has now exited the EU . Are there comparisons for other EU airports put forward.?

A QC (Quota count) value is assigned to each individual aircraft movement, based on noise levels provided on the aircrafts Noise Certificate . Current QC Bands are

0.125 - quota count of zero - less than 90dB
0.25 Quota count of 0 -less than 90 dB
0.5 less than 90 EPNdB
1 EPNdB 90 – 92.9 is QC/1
2 EPNdB 93 – 95-9 is QC/2
4 EPNdB 96 – 98.9 is QC/4
8 EPNdB 99 – 101.9 is QC/8
16 EPNdB over 101.9 is QC/16

a lower QC for aircraft with lower noise levels, higher QC for noisier aircraft.

For each reduction of 3 in EPNdB the QC is halved:
EPNdB over 101.9 is QC/16
EPNdB 99 – 101.9 is QC/8
EPNdB 96 – 98.9 is QC/4
EPNdB 93 – 95-9 is QC/2
EPNdB 90 – 92.9 is QC/1
EPNdB less than 90 is QC/0.5
EPNdB less than 87 is exempt (ie QC of zero).

A limit is placed on the total number of QC points - (how these are assigned per night is at the discretion of the airport operator). Thus under a pure quota count system, if planes rated at 96 EPNdB were replaced with planes rated at 95 EPNdB, twice as many could be flown during the restricted period.

THERE ARE 9 different QC values put forward.

Aircraft have a separate QC values for arrival and for departure.

Arrival
Departure.

Will the quota counts be based on ATOW or Aircraft Landing weight.

(Aircraft Take off Weight)

The proposals for a Night Quota System are for an Annual Night Quota (ANQ) applied to a 6.5h Night Qouta period (23.30 – 05.59) ANCA have now agreed 16, 260 for the applicant ahead of any CAO being formulated.

Draft implementation proposals are provided in Section 5 (refer to another Section) and are based on those in Stansted currently.

THESE WILL BE FINALISED IN ADVANCE OF THE ANQ COMING INTO PLACE SHOULD THE RELEVANT ACTION APPLICATION BE GRANTED PERMISSION -,making assumption of grant of permission. The bar has been set now at 16,260 an increase of 8,270 per annum with the DRD.

So DAA are redefining the night hours by reducing night time, thus removing 91 minutes from the night time hours per the WHO and standardised and accepted night time sleep and rest hours.

The applicant is dictating the terms, redefining the hours, and dictating to ANCA a system, that is in place in the UK , now outside the EU in relation to the ICAO and EU END (European Noise Directive) as a result of Brexit.

The DAA consider that a movements based constraint would not promote the use of quieter aircraft during the night consistent with achieving the effects based outcomes of the cNAO

They state that use of the QC system will incentivise airlines to modernise . This is purely a statement to justify the AQS, as this would be a natural progression with new generation aircraft getting better anyway.

What the QC does is to say to airlines, the quieter your aircrafts the more ATMS you can have, thus increasing the night time activity per 8 hour period. Remember the current restrictions in the planning only permits 65 movements on the current runway with ZERO - no flights on the new runway in the interests of the health and well being of the near- by communities, and those significantly and adversely affected by SEL levels of take off and landings, during night time hours 2100 – 0700 .

Considerations for the development of the Night Quota include:

The implementation of EU598.

Development of an Annual Noise quota Allowance

The duration of the Night Quota period and shoulder hours?

Implementation and management processes

Other special cases such as allowances by runway, or by night

So the applicant is making assumptions around their proposals on a NQS that is UK based, outside the EU now, for implementation by ANCA under the EU598/2014 Directive. The above states the following:

A noise quota allowance annually has to be developed.

Decision and confirmation on the NQ night quota period and the shoulder hours - which should be 10-11pm (2200 – 2300) and not 1100 – 1200 , as night begins at 2300 and lasts until 0700 .

How will this implemented and managed – by who – who will validate the process and who will oversee it independently.

FCC are part of ANCA – DAA fund ANCA and the balanced approach must be equally for residents and for DAA and airlines.

What are the Special cases - Allowances per runway - or by night - this needs to be expanded on in the interest of the adversely affected residents.

Whilst analysis indicates that source, operating procedure and land use measures meet the CNAO – proposed by daa - (Candidate Noise Abatement Objective) , Daa is proposing an NQS to provide further assurances around the control of noise at night and to encourage the continued update of the fleet operating at Dublin Airport to comprise of quieter aircraft (consistent with the ICAO balance approach)

So what assurances are always there , and defines this as further control of noise at night?

The QCS encourages more flights per hour with quieter aircraft to fit into the now increased 16,260 granted by ANCA in their Draft Regulation Document over the original request of the 7990 figure. So how many flights, ATMs do DAA see in the 16,260 figure in 2023, 2024 and 2025 and 2026 2027 2028 2029 and 2030.

What is the actual figure of night time ATMs - actual SEL events in the figure of 16260 AQC.

Notwithstanding the above overwhelming policy support for the proposed Relevant Action, the potential for impacts on local communities as a result of the proposed Relevant Action has been assessed in great detail through the course of preparing this application . In this regard, the proposed, the Relevant Action seeks to apply the balanced approach to aircraft noise management at the airport and by introducing new noise mitigations and transparent monitoring safeguards . As a result, it is considered that the proposed Relevant Acton will provide an acceptable balance for all stakeholders and ensure that noise will continue to be controlled at the airport upon the commencement of use of North Runway.

The above taken from the Planning report – makes a statement to the humans living directly under the flight path on the boundary of daa lands .

- ***Only those significantly and adversely affected on the flight path , with aircraft take off and landings at 1000 – 3000ft altitude and experiencing up to 90db - SEL measures and more, can answer that statement. No meaningful consultation has taken place with those persons/ humans.***
- ***Are homeowners considered as stakeholders , living under the flight paths . – insignificant in the airport masterplan ?***
- ***Noise will continue to be controlled at THE AIRPORT when North Runway opens - so Daa control , report , monitor the data, the perception, the Noise problem, and the actual incident noise impacts all will continue to be tailor made reports by the Authors and also the approvers.***

Health Impacts

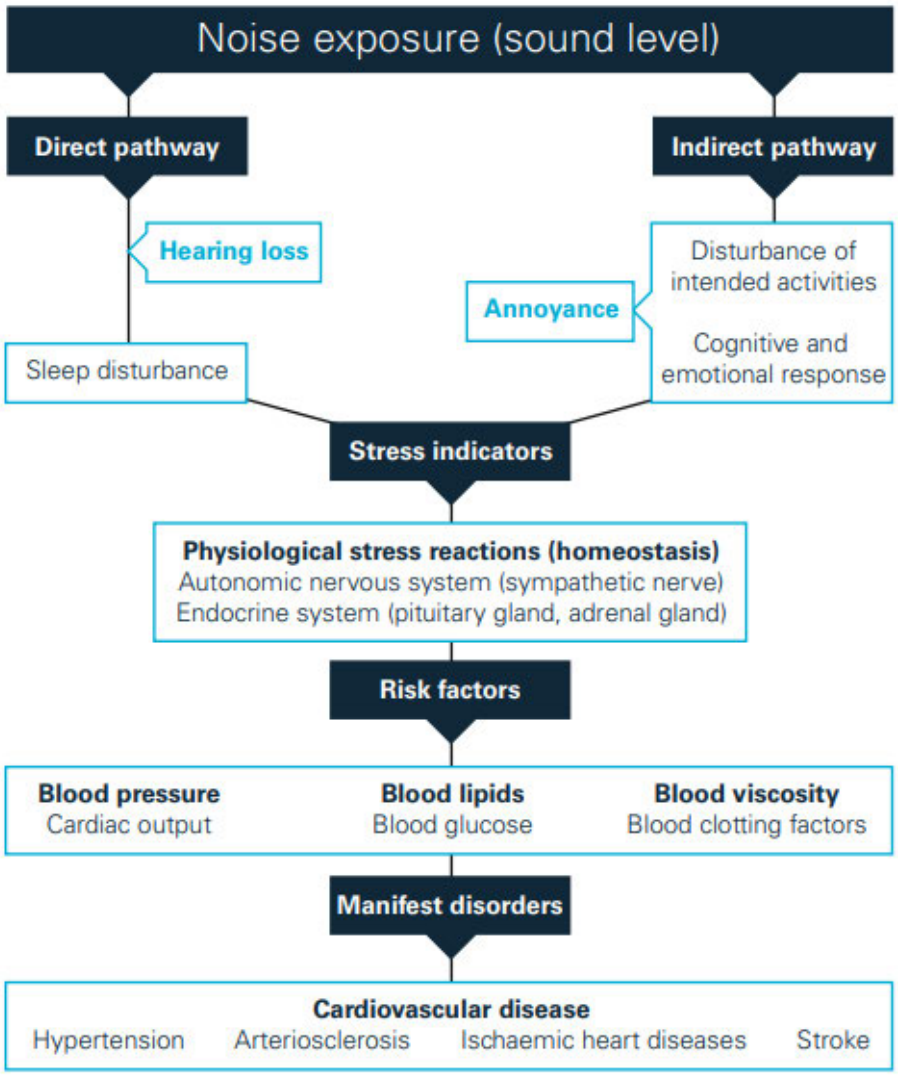


Figure 2: Noise reaction chart, updated version. Taken from Babisch, 2013.

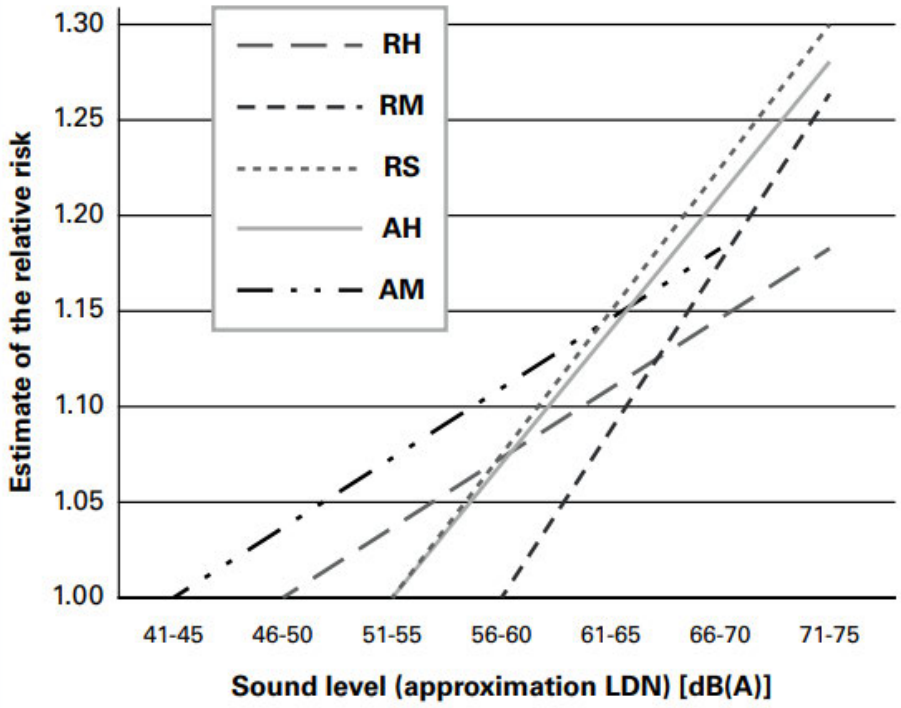


Figure 3: Exposure-response curves of the association between transportation noise and cardiovascular diseases. RH = road traffic noise – hypertension, RM = road traffic noise – myocardial infarction, RS = road traffic noise – stroke, AH = aircraft noise – hypertension, AM = aircraft noise – myocardial infarction.

3.33 Clearly, potential moderators and confounding variables need consideration in such research. These include location of rooms, windows being open or closed, length of residence, age, gender, and type of housing. Babisch suggests that future work should improve the noise assessment to consider secondary road networks and side streets, and quiet side dwellings should be included in the assessment. It is important that day-night differences should be investigated further, in relation to noise-induced sleep disturbance and development of cardiovascular diseases. Air pollution as a confounders or co-exposure also needs to be included in future work.

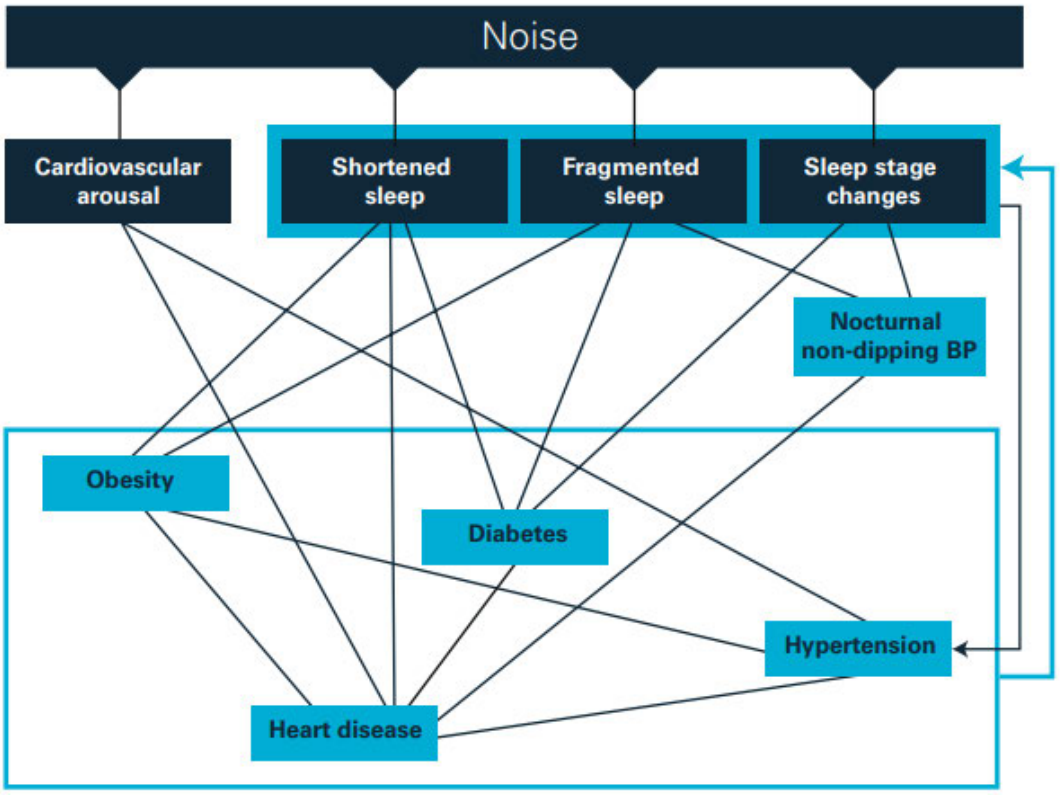


Figure 5: Proposed potential pathways for the health effects of noise through sleep disturbance. Reproduced without permission from the PARTNER report, 2010. Non-dipping blood pressure refers to the absence of a nocturnal decrease in blood pressure that usually occurs during sleep.

Internoise 2013

3.34 Various other papers that are relevant to aircraft noise exposure and health effects were published or presented at Internoise 2013 since the last literature review. Matsui from Hokkaido University in Japan reported findings on psychosomatic disorder due to aircraft noise. The study re-analysed previous data obtained from a study in Okinawa around Kadena and Futenma military airfields. This study had shown a dose-response relationship between the prevalence of psychosomatic disorder (PSD) and Ldn of aircraft noise based on responses from the Total Health Index (THI) questionnaire. PSD was diagnosed from a Discriminant Function (DF) score calculated from the answers to the THI questionnaire. The purpose of this study was to re-analyse the data to examine the causal pathway of this relationship and the answers on disturbances to daily life due to aircraft noise (which was obtained from another questionnaire given to the same subjects). The DF score of PSD was analysed with sleep disturbance and speech interference, in relation to day-time and night-time noise exposure. The results indicated that the PSD score around Kadena airfield was significantly associated with sleep disturbance, and the annoyance score was more highly associated with speech interference than sleep disturbance. The conclusion given by the author was that in this location, PSD due to aircraft noise is actually a result of sleep disturbance. These results corroborate those found from a new Narita study, and analysis on hypertension observed around Kadena airfield, which also found that night-time noise was correlated with prevalence of hypertension.

3.35 It should be emphasised that military aircraft is typically somewhat different to that associated with civil airports, being composed for louder, but less-frequent events. Historical annoyance surveys around military airfields have tended to show elevated responses for a given noise exposure level.

4.14 The report covers the study designs and methodologies used in noise effects research, an introduction to the physiological aspects of sleep and it describes in considerable detail the mechanisms by which sleep loss, deprivation or fragmentation may link to potential health outcomes. These include heart rate changes, alterations in sympathetic tone, connection of sympathetic tone with glucose mismanagement, obesity, the appetite regulating hormones leptin and ghrelin, immune effects of sleep loss, glucose regulation and diabetes, and cardiovascular non-dipping. The effects of noise that are included are memory, noise sensitivity, the relationship between annoyance and cardiovascular disease, performance decrements and task interference.

4.15 The methodologies used for the cost-benefit analysis of noise are discussed, with the consensus being that the use of Disability Adjusted Life Years (DALYs) is at present the most appropriate method for valuing the effects of noise. Because this measure is used widely to predict and evaluate the cost of other health outcomes, it is considered useful when making comparisons between the total impact on health of various exposure increases or interventions. For example, for communities near airports, the health effects cost of chemical and particulate exposure can be compared to the health effects cost of noise. Some drawbacks concerning this system include, for example, that it is seen as focusing disproportionate attention on measureable outcomes and poses difficulties for dealing with co-morbidities.

These Extracts have been taken from the a report by the CAA - Aircraft Noise, Sleep Disturbance and Health Effects - CAP1164 – 33 pages.

The diagrams and the report clearly show the impact of aircraft noise on a sleeping person and households. We do accept there will be 16 hours of operation on the North Runway , but that will be relieved with 8 hours to refresh and regenerate for the next day.

The cumulative long term effect of aircraft noise over a 24 hour period x 7 days x 365 days a year, with the knowledge , it is going to increase, in ATMS . The reduction in aircraft will do little to balance the increased number of aircraft taking off and landing at Dublin Airport and increased ground activity - over the next 3 years – 5 years and 10 years.

There's good evidence to suggest that more people are annoyed at lower levels of aircraft noise today than in the past, despite the introduction of relatively less noisy planes. The CAA's 2014 study into attitudes towards aircraft noise showed the same percentage of respondents highly annoyed at 54dB Leq as were previously affected at 57dB Leq (in 1982).

Some researchers agree with the view of many communities that this could be, in part, related to the increase in the number of noise incidents experienced. While airport noise maps may show noise 'contours' shrinking over time there has been no evidence of a reduction in community concerns.

Changes in exposure as a result of flightpath changes or intensification of use also appear to be a significant factor in explaining community annoyance. This is particularly relevant given the current reorganisation of UK airspace to accommodate precision navigation being pursued as part of a Europe-wide reform of air traffic management. Given the greater accuracy of satellite-based navigation, flight paths have become narrower. This can have advantages and disadvantages: while it could lead to a decrease in the number of people overflown compared to a more dispersed approach, it tends to concentrate more flights over communities living directly under the flightpath.

Aircraft noise is a public health issue. It can impact memory and learning in children, disturb sleep, and cause serious long-term health problems including cardiovascular disease. A large scale study around Heathrow Airport found that people living under the flightpath were 10-20% more at risk of stroke and heart disease than those not living under the flight path. There is also emerging evidence of impacts on mental health, linked to increases in stress and anxiety. A large body of health evidence is reviewed in AEF's 2016 report Aircraft Noise and Public Health: the Evidence is Loud and Clear. The World Health Organisation (Europe Region) issued its Environmental Health Guidelines in October 2018 which make specific health-based recommendations for limiting night and daytime exposure to aircraft noise.

Aircraft noise can impact memory and learning in children, disturb sleep, and cause serious long-term health problems including cardiovascular disease.

Actions to tackle noise

Because aviation is exempt from noise nuisance claims, there is little legal protection for people affected by aircraft noise. AEF's published guides explain the relevant legislation and role of regulators and other bodies, how to complain about aircraft noise, and how to make your views known in the airspace change and planning processes. With the exception of Heathrow, Gatwick and Stansted where the Secretary of State uses discretionary powers to impose noise regulations, most airports and airfields in the UK are regulated by the planning system, with variable results. Some airports have planning conditions or agreements limiting operating hours and numbers of movements for example, but others can operate under established use rights with few restrictions. In some cases, certain activities or developments can operate under deemed or temporary permissions that don't even require a planning application. This means that many ongoing noise issues are dependent on local resolution between communities and airports.

The Independent Commission on Civil Aviation Noise (ICCAN) became operational in January 2019, with a remit to be "an impartial, authoritative voice on aviation noise matters". However, following an independent review of ICCAN's objectives, functions and outcomes, the Government took the decision to dismantle the Commission in September 2021.

AEF's role

AEF is calling for the introduction of quantitative noise limits and targets including delivery of the WHO's recommendations to protect health. We also support the introduction of quieter technologies through the imposition of tougher noise standards for manufacturers (we play an active role in the UN ICAO's Committee on Aviation Environmental Protection where these standards are set), as well as incentives and regulations to remove old, noisy technology from the fleet. We provide a voice for communities on national policy matters, and currently attend the Department for Transport's Airspace and Noise Engagement Group (ANEG) and its Airspace Strategy Board, which oversees the modernisation of UK airspace.

The Applicant has used the UK as their comparison to put forward their assumptions , projections , operating data , for a runway that is not yet open. Looking at health studies in Germany (The Sleep Study -STRAIN Cologne and Frankfurt Airport) it is very clear the health impacts of removing Condition 3(d) and Condition 5 as set out by ABP in the planning permission. The effects on health were robustly presented by UPROAR at the Oral Hearing in 2006, thus leading to these night time restrictions.

While our school, in St Margarets may have the best sound insulation possible, indoors for teaching and learning , this will be cancelled , if a child, student is denied a full nights sleep and restful night time period, or study environment with ambient noise levels for learning.

Air Quality and GHG (Green House Gases)

As a homeowner, it is very difficult to understand this subject and even more so the chapter in the EIAR.
To make a submission on this issue of Air quality that impacts on those humans under the flight path and on the ground, parallel to the runways, a study was undertaken to under the pollutants around Dublin Airport and the impact of them. References were taken from

the WHO (World Health Organisation) and other information , available online. Surprising , was the lack of information on Benzene, a harmful pollutant to human health and note the applicant has not included this pollutant in this EIAR.

Page 36 – Vol. 4 Inspectors report.
Mr. Bailey stated that noise has less compounding factors than air quality in terms of studies. Prof. Heffron answered questions on epidemeology vs. toxicological studies of airports. He confirmed that benzene is the most dangerous compound but is not an airport specific emission. Protection factors are used when extrapolating what is acceptable in terms of impact on human health and a conservative policy is adopted in setting standards. It is being reduced by 1 ug per year until it becomes nought in 2010 thereby giving a setting of 5ug/m 3 . There is a 100% margin of tolerance included. As such a reading over 5ug/m 3 would not be a material concern as the protection factor set for levels of benzene are significantly below the level at which concerns in terms of human health would arise. Ms. Lawton noted that benzene levels were recorded at 5.18 at St. Margaret's in 2003. Mr. Bailey stated that the annual average of benzene is the correct measurement not a monthly measurement.

Appendix 11A Required Aircraft Model Substitutions

11.1.1. As outlined in Chapter 11 Climate and Carbon , some aircraft models were not available with the Aviation Emissions Calculator or the Atmosfair Flight Emissions Calculator which were used to calculate GHG emissions associated with Air Traffic Movements (ATM) In these instances , the closest available model produced by the same manufacturer was selected s proxy.

In the Fleet Mixes Annex 2

The Boeing 737 freighter is not a scheduled flight.

The A380 – 800 and A350 – 900 are not scheduled and included the GHG models. .

When you fly atmosfair, your emissions are calculated as precisely as possible. The calculations include the effects of the different pollutants according to the latest scientific knowledge, especially to their impact at high altitude. At the same time every consumption of a given flight. A plane may have to take a detour because of fog, the load may be higher or lower than average. Variations like these cannot be included in the calculation.

So we note from the Atomosfair Flight Emissions Calculator, the results are based on assumptions of future weather forecasts, scientific knowledge on different pollutants put forward.

Note in the Oral hearing – Angela Lawton stated that the Benzene levels were recorded at r St Margarets at 5.18 in 2003
What is the level of Benzene at St Margarets and at the receptors in 2018 and 2021, and project in 2022 and 2025 .

(Extract taken from the Atomsfair Flight Emissions Calculator)

Emissions calculator

When you fly atmosfair, your emissions are calculated as precisely as possible. The calculations include the effects of the different pollutants according to the latest scientific knowledge, especially to their impact at high altitude.At the same time every calculation has its limits: one can only calculate a presumably fuel consumption of a given flight. A plane may have to take a detour because of fog, the load may be higher or lower than average. Variations like these cannot be included in the calculation.

Data on airplane types, engines, flight routes, etc., was generated in scientific research projects and verified by the Federal Environmental Agency in Berlin.

What factors are used in the calculation of emissions?

Not all flights are the same. It is obvious that a flight from Frankfurt to Honolulu causes more environmental damage than a flight from Hamburg to Cologne. In short, a number of factors other than the distance of a flight must be taken into account to calculate the impact of one single air-passenger on the world's climate, and thus to determine how much an "atmosfair ticket" should cost.

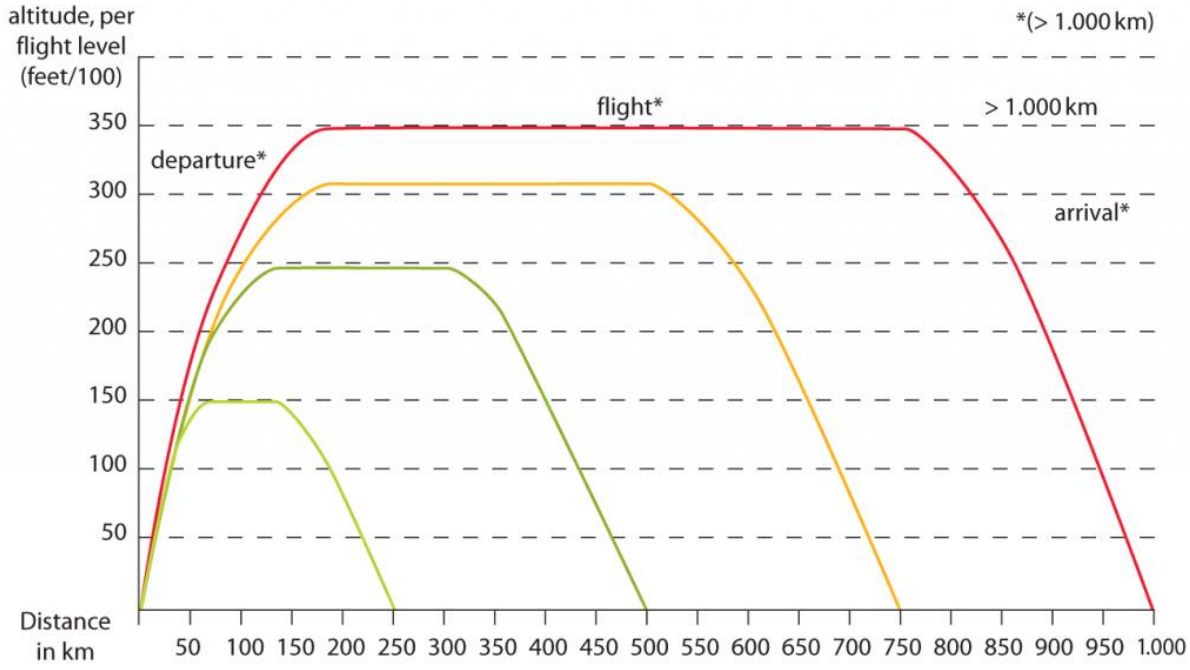
The atmosfair emissions calculator has received several awards for its detailed and exact calculations.

The emissions calculator contains stored data on all relevant information. Because the calculator uses data sets of high scientific quality, a Pi-mal-Daumen, or rough result is completely avoided. The data that is embedded in the calculator has been verified by the German Federal Environmental Agency.

VDPS

There is nothing onerous about Condition 3(d) and Condition 5 -as the wording is very clear.

The Onerous conditions , were condition 7 and 9 . The flight path residents have been excluded from the start to clarify these, and to participate in a meaningful way



Source: TÜV 2000

Air Quality data from EIAR reivsed - September 2021
Relevant Action to remove night time restrictions - Condition 3(d) and Condition 5.

Receptor No	Area	Year	No2	PM10	PM2.5			
13	**Kilreesk**	**2018 Baseline**	**18.8**	**11.1**	**6.8**			
11	**Millhead**	**2018 Baseline**	**19.08**	**11.1**	**6.9**			
29	**Dunbro**	**2018 Baseline**	**20.07**	**11.2**	**6.9**			
36	**Portmellick**	**2018 baseline**	**24.5**	**11.4**	**7.1**			
34	**Harristown**	**2018 Baseline**	**23.7**	**11.2**	**7**			
			No2 permitted.	No2 proposed.		Change	Impact	
13	Kilreesk	2022	16	16.2		0%	Negligible	
11	Millhead	2022	16	17.1		0%	Negligible	
29	Dunbro	2022	17	17.2		0%	Negligible	
36	Portmellick	2022	19.1	19.4		1%	Negligible	
34	Harristown	2022	19.6	19.7		1%	Negligible	
		Receptors modelled at a height of 1.5m						
13	Kilreesk	2025	15.2	15.3		0	Negligible	
11	Millhead	2025	16.5	16.8		1	Negligible	
29	Dunbro	2025	16.7	16.8		0	Negligible	
36	Portmellick	2025	19.7	19.6		0	Negligible	
34	Harristown	2025	20.2	19.8		-1	Negligible	
				2018	2018	2022	2022	
				PM10	PM2.5	PM10	pm2.5	
13	Kilreesk	2018 Baseline		11.1	6.8	10.6	6.4	All predicted to reduce minutely
11	Millhead	2018 Baseline		11.1	6.9	10.6	6.4	in 2025
29	Dunbro	2018 Baseline		11.2	6.9	10.6	6.5	
36	Portmellick	2018 baseline		11.4	7.1	10.7	6.5	All predicted to reduce minutely
34	Harristown	2018 Baseline		11.2	7	10.7	6.6	in 2025 (ug/m3 measurments)
								and 2035

Analysis 1

The following extract from the EIS with levels extracted for particular receptors relevant for our submission.
13 Kilreesk Lane
11 Millhead
36 Portmellick
34 Harristown – (take off point on South Ruway Western side)
29 Dunbro

Air Quality data from EIAR reivsed - September 2021
Relevant Action to remove night time restrictions - Condition 3(d) and Condition 5.

Odour results

Predicted Odour Concentration (Oue/m3) (98th Percentile)a

receptor	Area	Permitted.	Proposed 2022	Permitted 2025	Proposed 2025	Permitted 2035	Permitted. 2035	
11	Millhead	0.2	0.2	0.3	0.3	0.2	0.2	
13	Kilreesk	0.1	0.2	0.2	0.2	0.1	0.1	
29	Dunbro	0.1	0.1	0.2	0.2	0.1	0.1	Aircraft on runway rolling.
36	Portmellick	0.3	0.3	0.4	0.3	0.2	0.2	Take off / climb positon.
34	Harristown	0.5	0.5	0.6	0.6	0.4	0.4	Take off point on South runway.

so why is Harristown higher
The figures need to be explained in actual noise smell and how they are derived.

Analysis 2.

What is Particulate Matter (PM)?

Particulate matter, or PM, is the name given to fine dust or liquid particles that are suspended in the air we breathe. These particles can come from natural sources (such as pollen), or from human activities (such as fuel combustion).

Large PM (think: sand, pollen, or smoke) can be seen by the naked eye, but PM with a diameter of less than 10 micrometers (or PM10) is often too small to be perceived. That said, when fine PM exists in exceptionally high concentrations (as it does in Delhi and Beijing), it can form a visible haze. Regardless of whether or not we notice any visual changes in our air quality, inhaling high levels of fine particulate matter can have serious impacts on our health.

Dublin Airport experiences many weather issues with fog, during the winter months. .

PM2.5 Basics

When scientists, doctors, politicians, and environmentalists talk about particle pollution, they're usually talking about PM2.5 (particulate matter with a diameter of less than 2.5 microns). This super-fine, largely invisible pollutant is more than 30 times smaller than a single stand of human hair.

Due to its microscopic size, PM2.5 is easily inhaled and has the potential to travel deep into our respiratory tracts. Once there, it can cause chronic irritation, trigger allergies and asthma, and increase our risk of developing serious infections and disease such as COPD. More recent studies have also linked high particulate pollution levels to fertility complications and reduced life expectancy rates.

In addition to the density of air pollution, our sensitivity to PM2.5 depends on the nature of the chemicals or organic compounds present. Although we know high levels of PM2.5 are unequivocally bad for our health, the exact level at which they become problematic and the severity of the health effects of ambient PM2.5 are still being explored. Less severe symptoms of elevated PM2.5 include chronic skin, eye, and throat irritation, headaches, persistent allergy symptoms, and more frequent respiratory infections.

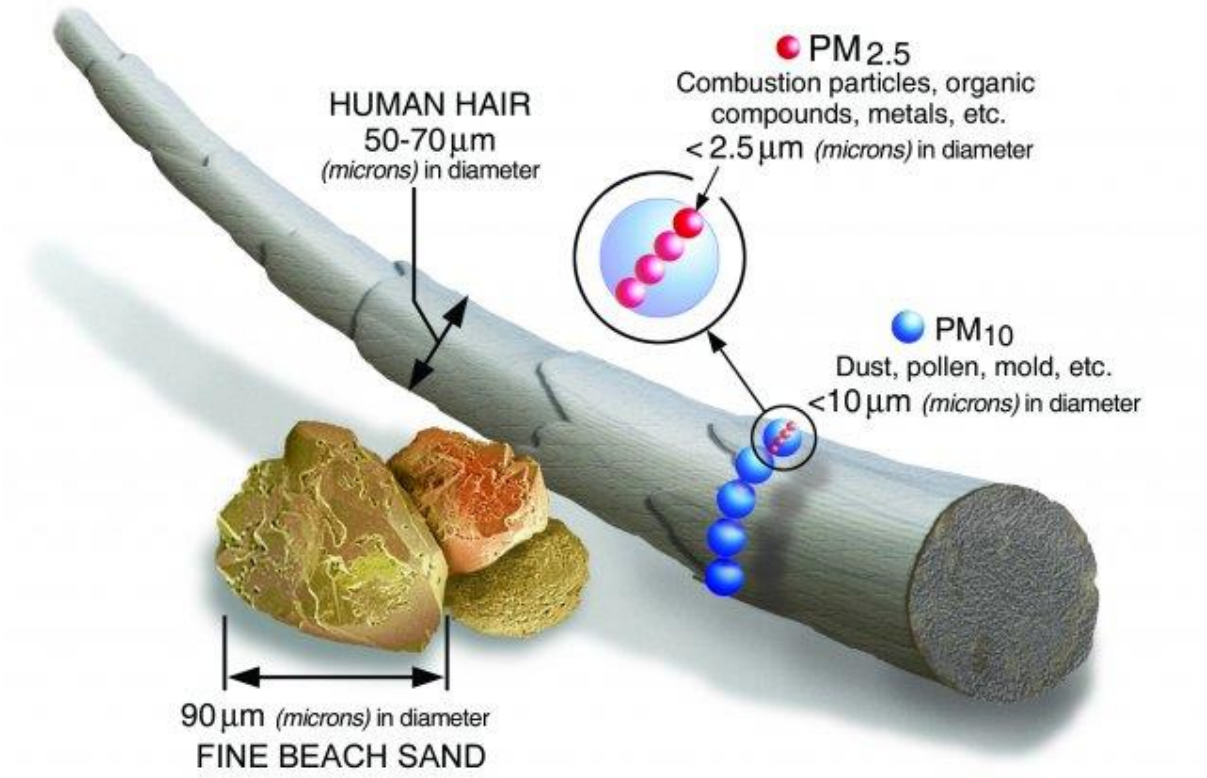
Be in the Know

Is the "fresh air" you're letting into your home truly healthy? Will opening a window help or hurt your asthma? Should you consider buying an air purifier, humidifier, or fan?

It's easy to feel overwhelmed by information about air pollution if you don't have the tools to change your environment. If you live in an area with high particle pollution, don't panic. Monitoring your indoor air quality at home and work is one way to take control of your health and the air you breathe.

When it comes to air quality, knowledge is power.

What is PM, and how does it get into the air?



Size comparisons for PM particlesWhat is PM, and how does it get into the air?

PM stands for particulate matter (also called particle pollution): the term for a mixture of solid particles and liquid droplets found in the air. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others are so small they can only be detected using an electron microscope.

Particle pollution includes:

- **PM_{10}**: inhalable particles, with diameters that are generally 10 micrometers and smaller; and
- **$PM_{2.5}$** : fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.
    - How small is 2.5 micrometers? Think about a single hair from your head. The average human hair is about 70 micrometers in diameter – making it 30 times larger than the largest fine particle.

Sources of PM

These particles come in many sizes and shapes and can be made up of hundreds of different chemicals.

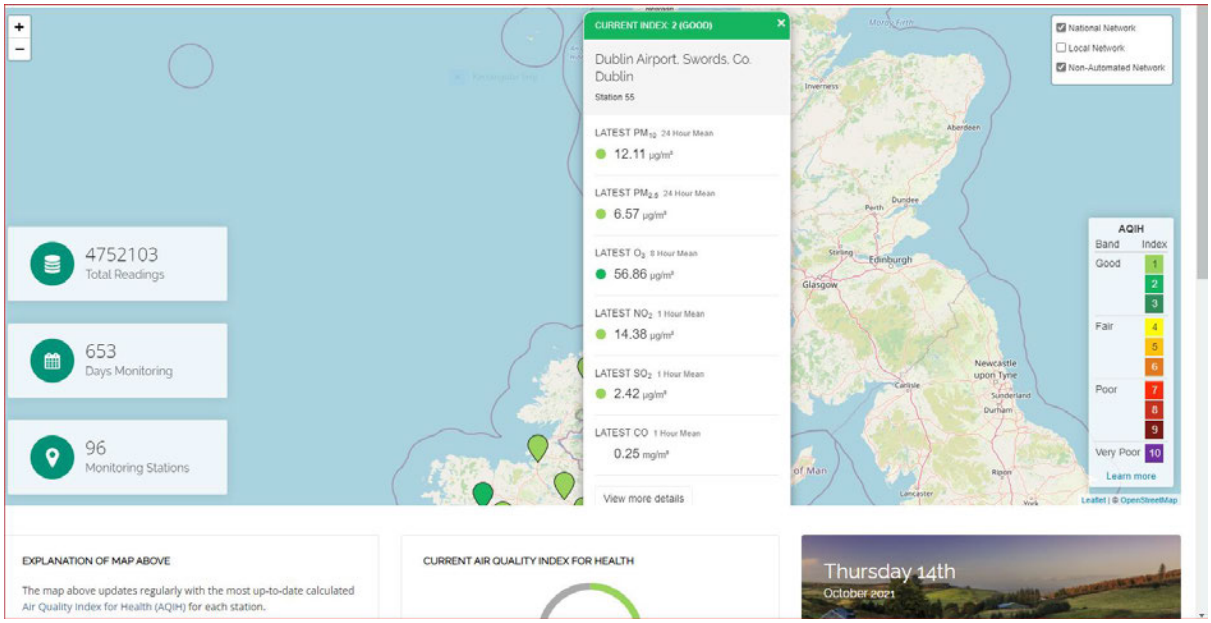
Some are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks or fires.

Most particles form in the atmosphere as a result of complex reactions of chemicals such as sulfur dioxide and nitrogen oxides, which are pollutants emitted from power plants, industries and automobiles.

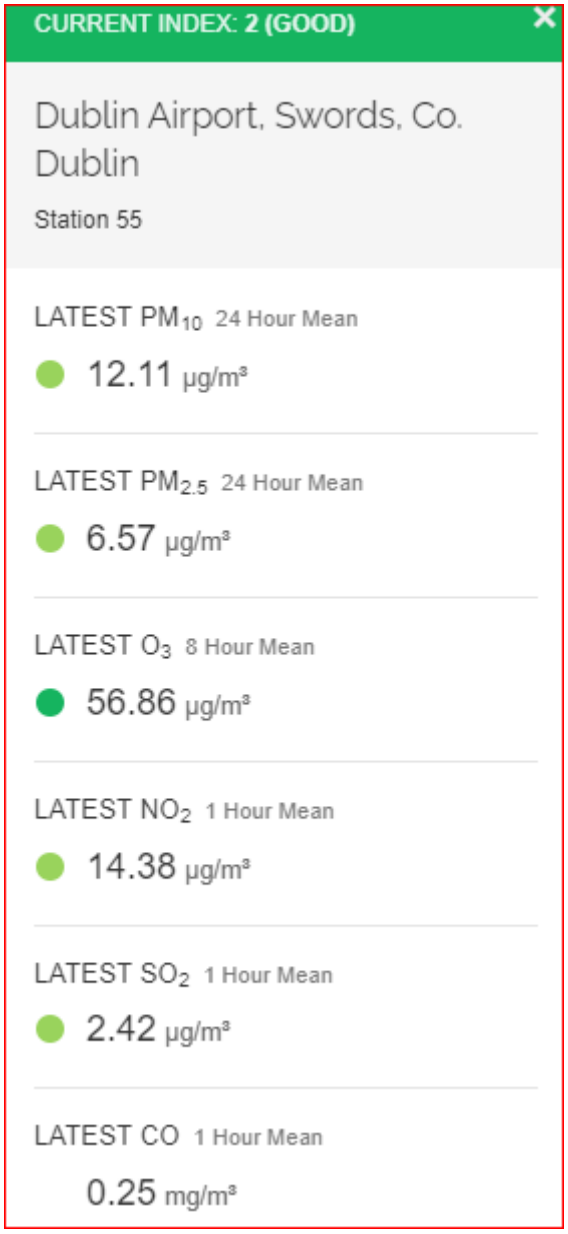
Particulate matter contains microscopic solids or liquid droplets that are so small that they can be inhaled and cause serious health problems. Some particles less than 10 micrometers in diameter can get deep into your lungs and some may even get into your bloodstream. Of these, particles less than 2.5 micrometers in diameter, also known as fine particles or PM_{25}, pose the greatest risk to health.

What are the Harmful Effects of PM?

Particulate matter contains microscopic solids or liquid droplets that are so small that they can be inhaled and cause serious health problems. Some particles less than 10 micrometers in diameter can get deep into your lungs and some may even get into your bloodstream. Of these, particles less than 2.5 micrometers in diameter, also known as fine particles or PM_{25}, pose the greatest risk to health.

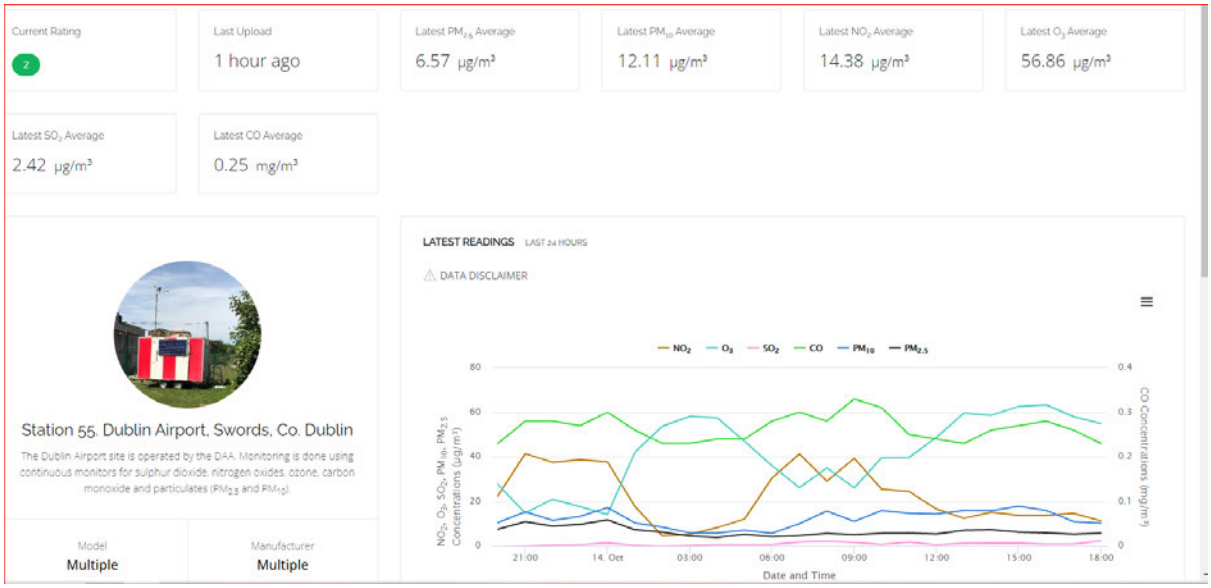


Extract from EPA report - reading on 14th October 2021



Where is the Station and how far from the receptors ?

Station 55 Dublin Airport Swords, Co Dublin.



Extract from EPA website – 14th October 2021.

What We Monitor

The Environmental Protection Agency manages the national ambient air quality monitoring network. We also measure the levels of a number of atmospheric pollutants. The pollutants of most concern are those whose main source is traffic such as Particulate Matter and Nitrogen Dioxide.

Particulate matter (PM_{10} and $PM_{2.5}$)

PM are particles in the air typically measured as PM_{10} and $PM_{2.5}$ with diameters of 10µm (microns) or 2.5µm. In Ireland, the main sources are solid fuel burning and vehicular traffic. Other sources are soil and road surfaces, construction works and industrial emissions or natural sources such as windblown salt, plant spores and pollens. These direct emissions are known as primary PM. Particulate matter can be formed from reactions between different pollutant gases (secondary sources).

Small particles can penetrate the lungs and cause damage. There are high levels of PM_{10} in many cities and towns.

Nitrogen dioxide (NO_2) and Nitrogen oxides (NO_x)

Emissions from traffic are the main source of nitrogen oxides in Ireland along with electricity generating stations and industry. Nitrogen dioxide can affect the throat and lung. The main effects are emphysema and cellular damage.

It impacts visually as it has a brown colour and gives rise to a brown haze. Oxides of nitrogen contribute to the formation of acid rain and of ozone.

Levels in Ireland are moderate but are increasing due to growth in traffic numbers.

Ozone (O_3)

Ozone is a natural component of the atmosphere. Most ozone is found high up in the stratosphere, the layer of the atmosphere between 12km and 50km above sea level. Stratospheric ozone is essential to life on earth as it protects us from harmful rays from the sun.

Ozone is also found in the troposphere, the layer of the atmosphere next to the earth. Exposure to high concentrations of tropospheric ozone causes chest pains, nausea and coughing in humans.

Long term exposure to moderate concentrations causes a reduction in lung capacity and can worsen heart disease, bronchitis, emphysema and asthma. Tropospheric ozone contributes to the greenhouse effect and subsequent global climate change.

Levels of ozone in Ireland are moderate.

Sulphur dioxide (SO_2)
The main source of sulphur dioxide in Ireland is burning coal and oil to heat homes and industries and to produce electricity.

It is an irritant gas which attacks the throat and lungs. Prolonged exposure can lead to increases in respiratory illnesses like chronic bronchitis. It contributes to the formation of acid rain which damages vegetation and buildings.

Levels in Ireland are low to moderate. Levels have decreased over recent years due to increased use of low-sulphur "smokeless" coal, increased use of natural gas instead of solid fuels and reduced industrial emissions through IPC licensing.

Carbon monoxide (CO)
The main source of carbon monoxide in Ireland is traffic. It is absorbed into the bloodstream more readily than oxygen, so the relatively small quantities in inhaled air can have harmful effects.

Prolonged exposure can cause tissue damage and individuals suffering from cardiovascular disease are particularly at risk. Levels in Ireland are low.

Benzene (C_6H_6)
Benzene comes from petrol emissions and the evaporation of petrol at petrol stations. It is a carcinogen.

Acute short-term inhalation may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritations, and, at high levels, unconsciousness. Levels of benzene are low in Ireland.

Lead (Pb)
The main source of lead in air has historically been from petrol engine exhaust emissions. High concentrations can affect mental and physical development in children. Long-term exposure to low levels of lead can affect the nervous system.

These is no details on Benzene levels around Dubin Airport. This does not appear to be addressed . So where are the Benzene levels for the receptors included in this submission.

Following taken from East Midlands Airport

Benzene is **present in aviation fuels** and the operation of aircraft (and vehicles) at the airport all contribute to the ambient concentration of

benzene. The Government's Air Quality Strategy establishes a very stringent target to safeguard health.

Reducing aircraft emissions

The way in which we control aircraft whilst they are on the ground and in the air can significantly affect emissions.

Our Air Traffic Controllers and airline partners work together to adopt rigorous measures, ensuring that emissions to air are minimised. This includes delaying an aircraft from starting any engines until it is known that take-off clearance will not be delayed. When taxiing to and from the runway many of our airline partners also manoeuvre using just one engine.
The **Continuous Descent Approach** technique which we promote among arriving aircraft also contributes to reduced aircraft emissions

Jet emissions contain particulate matter that affects the environment. According to studies, combustion of jet fuels culminates into the release of benzpyrene as a byproduct of incomplete combustion that normally comes out with soot (Rojo, 2007). This chemical is highly carcinogenic and has been shown to be a causative agent of many cancers as well as tumors in human beings culminating from skin and lung adsorptions. Besides, combustion of jet fuel has been associated with the production of high amounts of sulphur dioxide, a harmful gas that can cause severe irritation of the eyes and airway tracts. Literature indicates that jet fuel contains high concentrations of sulphur, nearly 1000ppm as compared to 10ppm in diesel (Mark J. & Mark W., 2000). During combustion, this is converted into the harmful sulphur dioxide, which is transmitted into the atmosphere thereby compromising quality of air.

Other harmful emissions include volatile organic compounds (VOCs) and carbon dioxide. VOCs can include, for example benzene, which is carcinogenic, and some forms of aldehydes that can cause forms of skin, eyes, and air tract irritation (Mark J. & Mark W., 2000). Volatile organic substances usually originate from vaporized fuel or incompletely combusted material that exits as exhaust gas. In some instances, the volatile compounds attach to particulate materials and escape into the air, culminating into compromised air quality around the airport. Carbon dioxide emanates from the combustion of organic fuels. It is a major contributor to climatic deterioration and global warming.

Sources indicate that this chemical is produced in large quantities from aircraft activities in the United States and other highly developed airports that have a lot of jet activity (Rojo, 2007). The resulting emissions find their way into the environment, adversely affecting the quality of air. This readily predisposes the populations living around airports, air travel personnel, and travellers, to dangerous environmental and health concerns. According to the Danish Ecocouncil (2012), jet emissions usually affect a radius of twenty-five miles around the airport area. This

implies that communities, animals, and crop plants are dusted with toxic jet emissions within a distance of twenty-five miles away from the airport every day.

Typically, airports spew toxic pollutants in hundreds of tons annually all over the world. Flow of air currents ensures that the toxic pollutants also reach water bodies where they negatively affect marine life.

Conclusion

Various pollutants caused by aviation practices affect the quality of air around airports posing a real health problem. Aircraft movements while on the ground, during landing and taking off, produce significant pollutant emissions, which affect the quality of air around airports. Besides, road traffic, other machinery, such as forklifts, cranes, and others, are also significant sources of air pollutants around the airport, posing a health risk to surrounding communities, air travel personnel, and travellers. Nitrogen dioxide, benzpyrene, sulphur dioxide, carbon dioxide, and volatile organic compounds are examples of harmful environmental pollutants caused by aviation. It is important to establish positive mitigation policies by all stakeholders, governments, and aircraft manufacturers to come up with proactive approaches aimed at air pollution reduction around airports.

Above from Reference : BohatALA.com - website research. 14th October 2021.

Benzene is a proven carcinogen. Its synergistic action with other pollutants can damage different components of the biosphere. Literature comparing the air quality standards of benzene, its monitoring methods and global concentrations are sparse. This study compiles the worldwide available air quality standards for benzene and highlights the importance of strict and uniform standards all over the world. It was found that out of the 193 United Nation member states, only 53 countries, including the European Union member states, have ambient air quality standard for benzene. Even where standards were available, in most cases, they were not protective of public health. An extensive literature review was conducted to compile the available monitoring and analysis methods for benzene, and found that the most preferred method, i.e, analyzing by Gas Chromatography and Mass spectroscopy is not cost effective and not suitable for real-time continuous monitoring. The study compared the concentrations of benzene in the indoor and outdoor air reported from

different countries. Though the higher concentrations of benzene noticed in the survey were mostly from Asian countries, both in the case of indoor and outdoor air, the concentrations were not statistically different across the various continents. Based on the analyzed data, the average benzene level in the ambient air of Asian countries (371 μg/m^3) was approximately 3.5 times higher than the indoor benzene levels (111 μg/m^3). Similarly, the outdoor to the indoor ratio of benzene level in European and North American Countries were found to be 1.2 and 7.7, respectively. This compilation will help the policymakers to include/revise the standards for benzene in future air quality guideline amendments.

Addressing Air Pollution resulting from Aviation

The International Civil Aviation Organization (ICAO) is mandated with the setting up of international standards that govern the emission of certain pollutant gases and smoke for new aircraft engines. That notwithstanding, only minimal improvements have occurred in the aviation industry in the reduction of harmful gases and emissions, as compared to other sectors that also use fuel (ICAO, 2014). Consequently, there is a need for more proactive approaches to mitigate the problem. For example, the adoption of better engine types that encompasses selective catalyst reduction mechanisms and the recirculation of exhaust gas to ensure maximum combustion. Most gaseous and vapor emissions have been associated with incomplete combustion of fuels (Environmental Protection UK, 2012).

Therefore, increasing the number of recirculation cycles will ensure complete combustion and a reduced amount of harmful emissions.

It is also important to develop proactive policies that are consistent with specific concerns associated with air quality and environmental conservation similar to related approaches in other industries, such as automobile. Currently, policies governing aircraft activities and environmental concerns are less stringent than those that govern other sectors of the economy involved with fuel combustion, such as factories and the automobile industry (Kularatna & Sudantha, 2008). This could be partly because most pollution by aircrafts takes place in the higher atmosphere compared to automobiles and other engine activities on the earth's surface. Integrating related aviation policies with those of the transport industry will achieve a common approach to environmental conservation.

Stakeholders, governments, and aircraft manufacturers should also review, develop, and adopt better aircraft technologies on a continuous basis to reduce the extent of air pollution and environmental concerns. In addition, plans should be in place to cater for expansion activities to reduce the overstretching of existing limited resources with increase in air travel demand

1.1. General

Volatile organic compounds (VOCs) are generally defined by the physicochemical properties like vapor pressure, molecular structure, air/water partition coefficient and boiling point. American Society for Testing and Material have defined VOCs by vapor pressure; "VOCs are organic compounds that have vapor pressure greater than 0.0133 kPa at 298 K" (American Society for Testing and Materials, 1996). The European Union have also defined VOCs with respect to vapor pressure; "VOCs must have a minimum vapor pressure of 0.01 kPa at 293 K" (European Union, 1999). World Health Organization (WHO) have defined VOCs with respect to boiling point; Very volatile organic compounds (VVOCs) have boiling points in the range of <0 to 50–100 C, Semi-volatile organic compounds (SVOCs) have it in the range of 240–260 °C to 380–400 °C and the Volatile organic compounds (VOCs) have boiling points in the range of 50–100 °C to 240–260 °C (World Health Organization, 1989). The VOCs emitted in the atmosphere include saturated and unsaturated hydrocarbons, organic alcohols, aromatic hydrocarbons, halogenated organic compounds and sulfur compounds (Keller, 1988). Out of these, organic compounds like benzene, toluene, ethylbenzene and xylene, commonly called as BTEX compounds, are found to be higher in the ambient air (Gaur et al., 2016; Montero-Montoya et al., 2018; Tiwari et al., 2010). Among the BTEX compounds, Benzene demands special attention. The US EPA risk assessment guidelines of 1986 had classified benzene as a "known human carcinogen" (Category A) (USEPA, 1986). The current carcinogenic risk assessment guidelines given by US EPA in 2005 has characterized benzene as a known human carcinogen based on human exposure evidence along with other supporting evidence from animal studies. Occupational based human exposure studies have concluded that exposure to benzene leads to toxic effects, both by oral and inhalation exposure (USEPA, 2005). Considering the toxic profile and the ubiquitous nature, it is necessary to monitor and regulate benzene in the ambient air.

1.2. Properties of benzene

Benzene remains in the vapor phase in the air. The lifetime of benzene in air ranges from a few hours to days and is dependent on the environmental conditions and the presence of other pollutants. The most important mode of degradation of benzene in the environment is through oxidation by hydroxyl radicle and subsequent removal by rain (WHO Regional Office for Europe, 2000). The physicochemical properties of benzene are shown in Table 1.

2.4. Europe

It is suggested that all the 28-member states in Europe should comply with the limit set for benzene at 5 µg/m^3 (annual) as per the Directive 2008/50/EC on ambient air quality and cleaner air for Europe. Among the European Union countries, France has the lowest long-term objective limit

for benzene at 2 µg/m3 (Annual) (Air quality observatory in the Paris region, 2018). Scotland and Northern Ireland set out an objective value of 3.25 µg/m3 (Air Pollution Information System, 2016), Sweden and Malta have a standard for annual mean with upper threshold: 3.5 µg/m3 and lower threshold of 2 µg/m3 (Ambient Air Quality Standards, 2010; Swedish Code of Statutes, 2010). Among countries of Europe other than the EU member states, Albania has a permissible limit of 5 µg/m3-8h in primary and secondary standards (Environmental center for Administration and Technology, 2008) and Belarus has limits 10 µg/m3 (calendar year) and 40 µg/m3 (24h) (European Union, 2012). Certain countries like Moldova and Ukraine follows standards of the Russian Federation with a maximum allowable concentration of 100 µg/m3 (24 h) (European Union, 2012).

WHO Guidelines .

Benzene in air exists predominately in the vapour phase, with residence times varying between a few hours and a few days, depending on the environment, the climate and the concentration of other pollutants. Reaction with hydroxy radicals is the most important means of degradation. It can also be removed from air by rain. Sources Benzene is a natural component of crude oil, and petrol contains 1–5% by volume. Within the European Union the maximum allowable concentration is 5%. Benzene is produced in large quantities from petroleum sources and is used for the chemical synthesis of ethyl benzene, phenol, cyclohexane and other substituted aromatic hydrocarbons. Production in 1988 was estimated to be 20 million tonnes worldwide and 5 million tonnes within the countries of the European Economic Community. Production in the USA and Japan in 1990 was estimated to be 5.4 million and 2.8 million tonnes, respectively (1). Benzene is emitted during its production and from coke ovens. Besides these industrial sources, emission also occurs from different combustion sources, such as motor engines, wood combustion and stationary fossil fuel combustion. The major source is exhaust emissions and evaporation losses from motor vehicles, and evaporation losses during the handling, distribution and storage of petrol.

Cigarette smoke is an important source of benzene in indoor air, and median benzene levels have been found to be higher in the homes of smokers (10.5 µg/m3) than those of nonsmokers (7 µg/m3) in the USA. Corresponding figures from Germany were 11 and 6.5 µg/m3 , respectively. The levels in the USA were higher than the corresponding median outdoor concentration, 6 µg/m3 , and the mean personal exposure was also higher at 15 µg/m3 (2, 8). The mean concentration of benzene in indoor air in homes across Canada was 7.4 µg/m3 , with a maximum value of 68 µg/m3 . The mean concentration in outdoor air was 4.4 µg/m3 (3). Passive sampling in households in Germany (Duisburg) showed an average concentration of benzene in children's bedrooms of 9.5 µg/m3 compared to 1.8 µg/m3 outside the windows (9). Indoor air concentrations are enhanced in dwellings near petrol stations (10). Studies of benzene concentrations in the interior of vehicles while driving have shown values of 10–120 µg/m3 in Germany, 37–57 µg/m3 in Sweden, 30–115

µg/m3 in the Netherlands, and mean values of 12–50 µg/m3 in the USA (5). Conversion factors 1 ppm = 3.19 mg/m3 1 mg/m3 = 0.313 ppm

The study area has been defined modelling study include a selection of residential properties and other sensitive locations such as schools and community facilities . A total of 52 existing receptors were modelled that may be affected by the operation of the runway system.

1. How do we know the baseline used for Air quality and greenhouse gases is correct for this assessment If the information is correct , then the LTO cycles will double when the new runway opens for operation . Residents will experience CO2 (nitrogen dioxide) and Particulate Matter (PM10 and PM2.5) with hydrocarbon (HC) emissions have been derived based on the anticipated aircraft operations in idle mode.
2. The Air Quality states that APU emissions have not been assessed .

The assessment also considers the additional surface passenger journeys as a result of the relevant action.

This will increase road traffic from the south and west -with the growth of cargo and the relocation of Dublin Port to the western side of Dublin Airport, with DHL, TNT UPS and other carriers, increasing cargo activity at Dublin Airport- Currently there are nine (9) scheduled cargo ATMs at Dublin at night.

As a result of a second runway operating, this will increase the number of Aircraft related activity , Aircraft equipment, aircraft stands etc.

GHG Gases - & EPA .

The GHG assessment study area considers all GHG emissions from fuel used by aircraft during the additional LTO and climb cruise descent (CCD) phases and from additional surface access passenger journeys as a result of the proposed Relevant action.

There is no specific criteria for determining the significance of GHG emissions. As such, the projected National Emissions Inventories for Ireland (EPA 2019) as compiled by the EPA have been used for the level of effect of GHG emissions as a result of the proposed Relevant Action on the global climate.

None of the affects are of major significance as the GHG emissions associated with this Relevant Action to not represent >1%of the projected National Emissions Inventory for either of the assessment years.

The total amount of GHG for 2018 was 60.51million tonnes of GHG and aircraft emissions are not recorded and are exempt. This equates to 605,100 tonnes representing the >1 % that is stated in this application.

60.510,000 divided by 52 = 11,636.53 per week = 1,662.36 per night.(Tonnes)

The EIS states: The significance of GHG emissions impact of the Revelant Action considering the receptors sensitivity (global climate) is anticipated to be minor, which is considered to be of low significance.
DAA offset carbon levels under the EU Emission Trading Scheme and the ICAO Carbon Offsetting and reduction Scheme for International Aviation (CORSIA)

This issue for residents living parallel to the runways and in the flightpaths needs to be addressed appropriately .

Table 2.2. Historical and projected emissions for the non-ETS and ETS sectors (kt CO_2eq[34]) for *With Existing Measures* and *With Additional Measures* scenarios

		Non-ETS sector	ETS sector	Total
Historical	2005	47098.82	22396.21	69495.03
	2008	46918.03	20383.79	67301.83
	2009	44330.87	17216.36	61547.23
	2010	43750.07	17354.78	61104.84
	2011	41230.35	15758.84	56989.19
	2012	40757.66	16853.87	57611.53
	2013	41713.48	15696.73	57410.21
	2014	41130.01	15968.53	57098.54
	2015	42363.41	16848.41	59211.81
	2016	43517.55	17752.65	61270.20
	2017	43830.35	16913.37	60743.73
	With Existing Measures scenario			
Projected	2018	44463.01	17357.08	61850.55
	2020	44568.69	16933.27	61532.48
	2025	44264.39	19512.53	63807.62
	2030	43989.73	20306.00	64326.67
	2035	43394.59	17893.20	61319.01
	2040	42813.54	18802.95	61647.70
	With Additional Measures scenario			
	2018	44361.77	17080.26	61472.49
	2020	43978.22	16524.17	60532.91
	2025	43047.27	18352.96	61430.94
	2030	41076.24	13448.26	54555.44
	2035	39499.58	15671.85	55202.65
	2040	37901.73	17133.05	55066.00

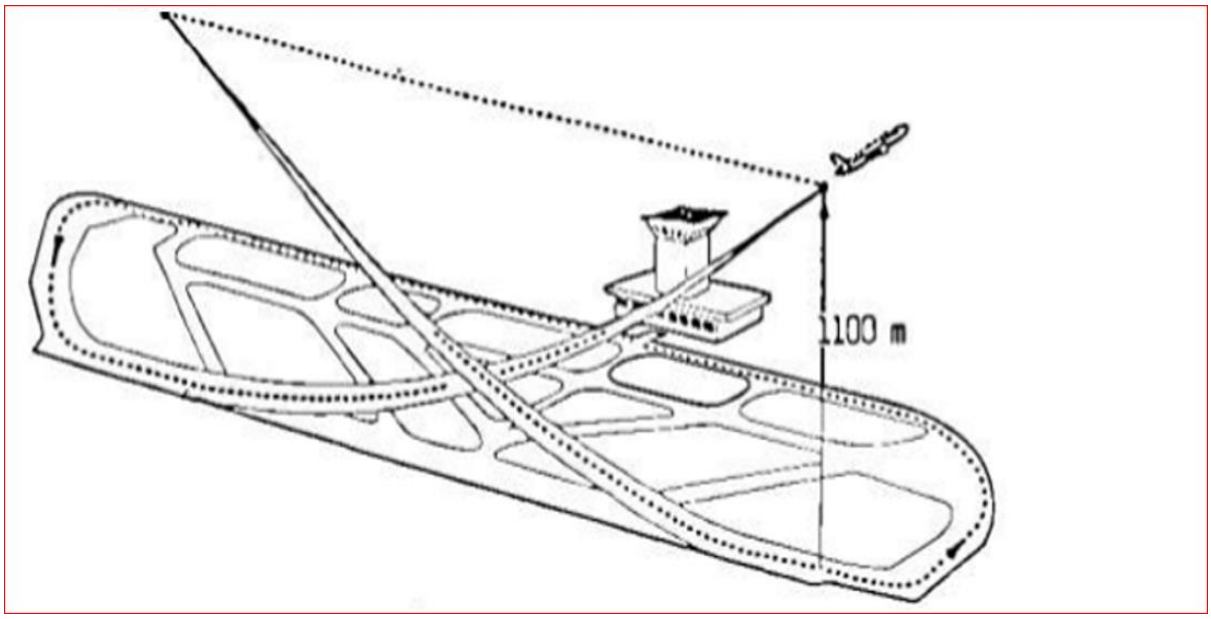
Note: Totals excludes Land Use, Land Use Change and Forestry (LULUCF)

Comparison of typical LTO-Cycle emissions with aircraft engine- and airport-specific emissions for greek airports

- August 2005

INTRODUCTION

Aircraft and airport related emissions have received considerable attention in recent years, both on national and international agendas. Although most of aircraft emissions are released during cruise at altitudes higher than 1.000 m (outside the atmospheric boundary layer), the effect of aircraft emissions at ground level is of major importance since most airports are close to urban areas [1]. In this work, ground-level emissions are estimated for three representative Greek airports, in Thessaloniki, Rhodes and Kavala for the year 2000. The LTO cycle defines the aircraft activity of interest. Emissions during flight at cruising altitude are not within the scope of this study. In the first step of an LTO cycle the aircraft descends from cruising altitude, approaches



the cycle: taxi out/idle, take-off and climb out. These five LTO cycle operating modes are defined by the existence of standard power settings for a given aircraft, so the modes represent an appropriate basis for estimating emissions. A schematic view of an LTO cycle is presented above – Aircraft activities during the LTO cycle.

Up to now, aircraft emissions in Greece have been estimated using average emission factors (in kg/LTO) per aircraft type based on standard/typical LTO cycles in terms of thrust settings and time spent in the specific mode [2]. This work focuses on the calculation of aircraft engine-specific emission factors, developed for selected airports. The resulting emissions are compared with the results of the simple methodology and the differences are discussed.

In conclusion ***This issue for residents living parallel to the runways and in the flightpaths needs to be addressed appropriately .***

Extract from Oral hearing – 2006.

Volume 4 – Inspectors report – page 32 .

Dr. Staines stated that it is the purpose of the EIS to show whether any health effects would occur. He stated that Health Monitoring such as that carried out by the RIVM (Dutch Environmental Health Agency) in the region of Schipol Airport entails two elements including detailed environmental monitors including noise, emissions and flight patterns and ongoing health studies of the populations. The programme has been built up gradually over time. Dr. Staines stated that in terms of the National Air Quality Standards the theory is that the levels are set below the level at which effects on human health are detectable. Emission levels are set at what can be achieved not at a level at which human health would be affected.

Mr. Stanley (Submission AA) stated that St. Margaret's is within the zone affected by the flight path during take-off/climb out and approach/landing and so will be the main location where aircraft emissions may impact on air quality beyond the site boundary.

What is the total LTO (in kg/LTO) for Dublin Airport for 2018 and 2019 when Dublin airport had 31.5 million passengers As stated above it is the projected National Emissions Inventories for Ireland has been used in this application. This includes CO2 emissions.

Extracts taken from ABP Oral Hearing 2006.

Questions to Planning Authority (Disc 1 – 05/10/06) Mr. Stanley stated that the airport and airlines are working to best international standards. The standards are an amalgam of opinions of various interested parties including the medical profession and aircraft manufacturers. With advancing technology aircraft become more efficient and pollution will decrease. Aircraft are less polluting than 20 years ago. Technology can only move at a certain rate. Every aircraft has to be registered and ensured that they are safe. By being safe they are less polluting. It does not pay to economise on maintenance grounds. He suggested that the WHO guidelines are taken into account in establishing the international standards. Mr. O'Faircheallaigh stated that the operation on an individual day is controlled by the Irish Aviation Authority through Air Traffic Control. The operation of the runway is under the control of the DAA. Mr. Stanley stated that the Stakeholder's Committee could influence how the runways are used and issues relating to fumes/odours should be raised with same.

He stated that the application of fines to the airline for deviations off the flight path does not benefit the community.

Air Quality - Page 35 of 60 Volume 4 of Inspectors reports
Prof. J. Heffron addressed the potential human health effects of air pollutants arising from aircraft emissions (submission AM). The relevant limit concentrations of benzene, carbon monoxide, nitrogen dioxide and PM10 are within the relevant limit concentrations for the protection of human health as set out in (a) Air Quality Standards Regulations 2002, S.I. No,271 of 2002 based on EU Air Quality Directive, Dublin 2002 and (b) Air Quality Guidelines for Europe, 2nd edition, WHO, Copenhagen 2000. The EU has been relatively conservative in terms of PM10 levels. The EU standards take into account the extra sensitivity of children and elderly and have a high safety factor built in.

Page 36 – Vol. 4 Inspectors report.
Mr. Bailey stated that noise has less compounding factors than air quality in terms of studies. Prof. Heffron answered questions on epidemeology vs. toxicological studies of airports. He confirmed that benzene is the most dangerous compound but is not an airport specific emission. Protection factors are used when extrapolating what is acceptable in terms of impact on human health and a conservative policy is adopted in setting standards. It is being reduced by 1 ug per year until it becomes nought in 2010 thereby giving a setting of 5ug/m 3 . There is a 100% margin of tolerance included. As such a reading over 5ug/m 3 would not be a material concern as the protection factor set for levels of benzene are significantly below the level at which concerns in terms of human health would arise. Ms. Lawton noted that benzene levels were recorded at 5.18 at St. Margaret's in 2003. Mr. Bailey stated that the annual average of benzene is the correct measurement not a monthly measurement. Mr. Bailey stated that Portmarnock is downwind of the airport and would not generally be affected by pollutants from aircraft which would be at altitudes in excess of 200m over the area. In the instances of inversion where there are foggy conditions with light winds the mixing layer would be at c.150 metres which would prevent pollutants from aircraft at the higher altitude from descending. Ozone formation generally takes place considerable distance downwind of urban areas as have to have chemical processes going on.

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In Conclusion, the projections put forward based on the Atmosfair calculations, and data supplied by the airlines with proxy models used, and considering the variances that occur due to weather, verification of aircraft load details , the results are not acceptable to those most adversely affected, in this submission and are only projected.

Also the omittance of the Benzene levels which was a key issue in the Oral hearing in 2006 , must now be addressed with levels validated for the receptor areas surrounding the runway and under the flightpaths. What are the levels at the receptors currently?

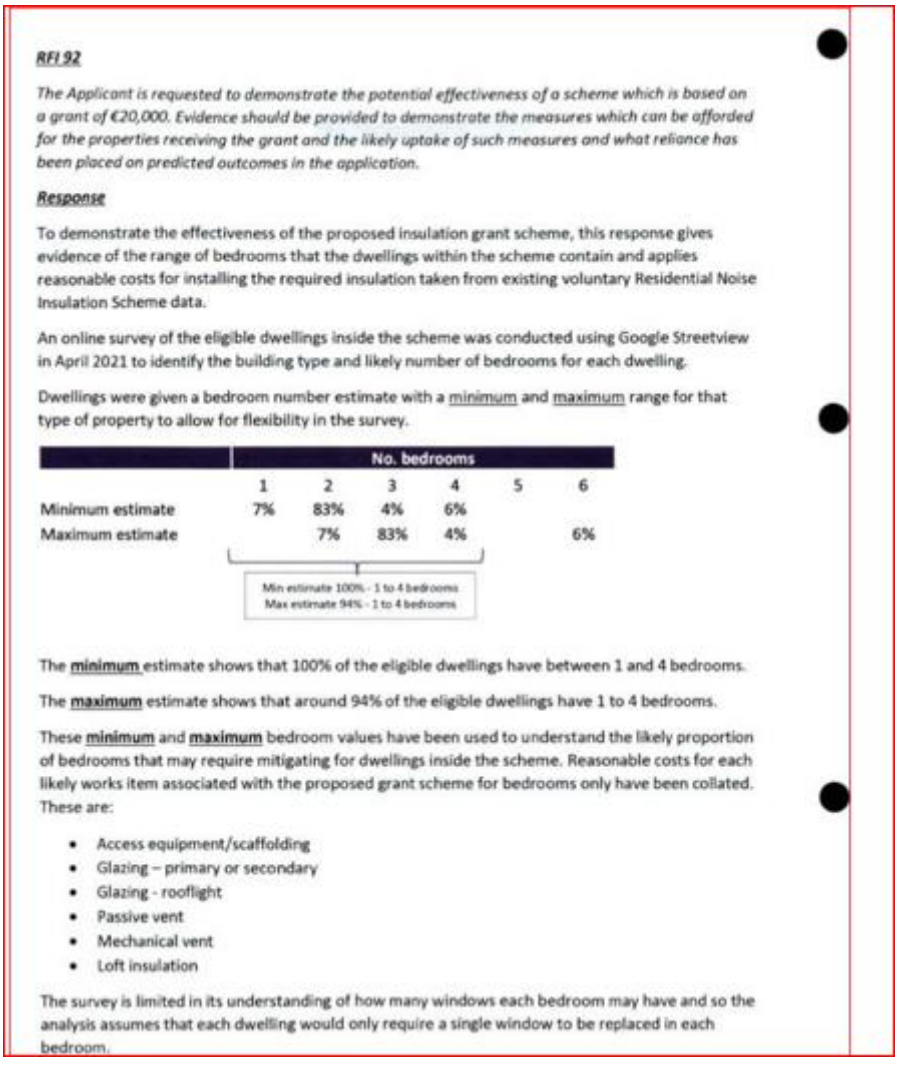
This should be supplied to the Planning Authority for completeness sake, in the full interest of the health and welfare and should be validated independently.

The lack of information , raises concerns for those adversely affected by approach to change the night time restrictions while this is not permitted under the Planning conditions as set out by ABP in August 2007.

The night time impact of Benzene and other harmful air pollutants , CO2 and PM2.5 and pm10 must be fully explored.

The Sound Insulation and VDPS Schemes.

This chapter should be viewed in conjunction with the Flight Path Data and the impact of health and the proposed AQS as part of the sound insulation scheme put forward by daa and FCC.



RFI 92

The Applicant is requested to demonstrate the potential effectiveness of a scheme which is based on a grant of €20,000. Evidence should be provided to demonstrate the measures which can be afforded for the properties receiving the grant and the likely uptake of such measures and what reliance has been placed on predicted outcomes in the application.

Response

To demonstrate the effectiveness of the proposed insulation grant scheme, this response gives evidence of the range of bedrooms that the dwellings within the scheme contain and applies reasonable costs for installing the required insulation taken from existing voluntary Residential Noise Insulation Scheme data.

An online survey of the eligible dwellings inside the scheme was conducted using Google Streetview in April 2021 to identify the building type and likely number of bedrooms for each dwelling.

Dwellings were given a bedroom number estimate with a minimum and maximum range for that type of property to allow for flexibility in the survey.

	No. bedrooms					
	1	2	3	4	5	6
Minimum estimate	7%	83%	4%	6%		
Maximum estimate		7%	83%	4%		6%

Min estimate 100% - 1 to 4 bedrooms
Max estimate 94% - 1 to 4 bedrooms

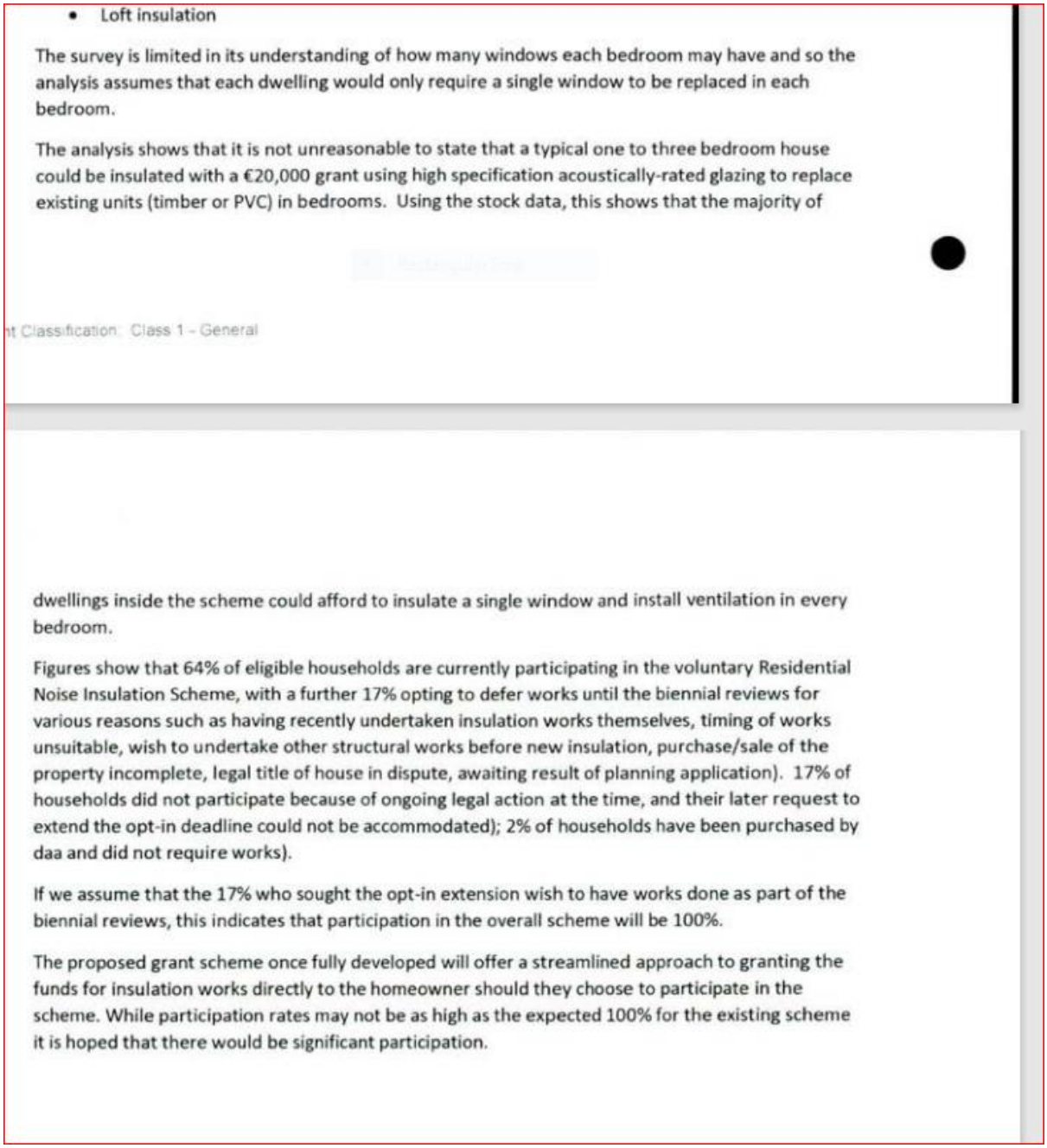
The **minimum** estimate shows that 100% of the eligible dwellings have between 1 and 4 bedrooms.

The **maximum** estimate shows that around 94% of the eligible dwellings have 1 to 4 bedrooms.

These **minimum** and **maximum** bedroom values have been used to understand the likely proportion of bedrooms that may require mitigating for dwellings inside the scheme. Reasonable costs for each likely works item associated with the proposed grant scheme for bedrooms only have been collated. These are:

- Access equipment/scaffolding
- Glazing – primary or secondary
- Glazing - rooflight
- Passive vent
- Mechanical vent
- Loft insulation

The survey is limited in its understanding of how many windows each bedroom may have and so the analysis assumes that each dwelling would only require a single window to be replaced in each bedroom.



- Loft insulation

The survey is limited in its understanding of how many windows each bedroom may have and so the analysis assumes that each dwelling would only require a single window to be replaced in each bedroom.

The analysis shows that it is not unreasonable to state that a typical one to three bedroom house could be insulated with a €20,000 grant using high specification acoustically-rated glazing to replace existing units (timber or PVC) in bedrooms. Using the stock data, this shows that the majority of

nt Classification: Class 1 - General

dwellings inside the scheme could afford to insulate a single window and install ventilation in every bedroom.

Figures show that 64% of eligible households are currently participating in the voluntary Residential Noise Insulation Scheme, with a further 17% opting to defer works until the biennial reviews for various reasons such as having recently undertaken insulation works themselves, timing of works unsuitable, wish to undertake other structural works before new insulation, purchase/sale of the property incomplete, legal title of house in dispute, awaiting result of planning application). 17% of households did not participate because of ongoing legal action at the time, and their later request to extend the opt-in deadline could not be accommodated); 2% of households have been purchased by daa and did not require works).

If we assume that the 17% who sought the opt-in extension wish to have works done as part of the biennial reviews, this indicates that participation in the overall scheme will be 100%.

The proposed grant scheme once fully developed will offer a streamlined approach to granting the funds for insulation works directly to the homeowner should they choose to participate in the scheme. While participation rates may not be as high as the expected 100% for the existing scheme it is hoped that there would be significant participation.

To focus on the wording and proposal of 20,000 grant.

The analysis shows that it is not unreasonable to state that a typical one to three bedroom house could be insulated with a €20,000 grant using high specification acoustically-rated glazing to replace existing units (timber or PVC) in bedrooms. Using the stock data, this shows that the majority of

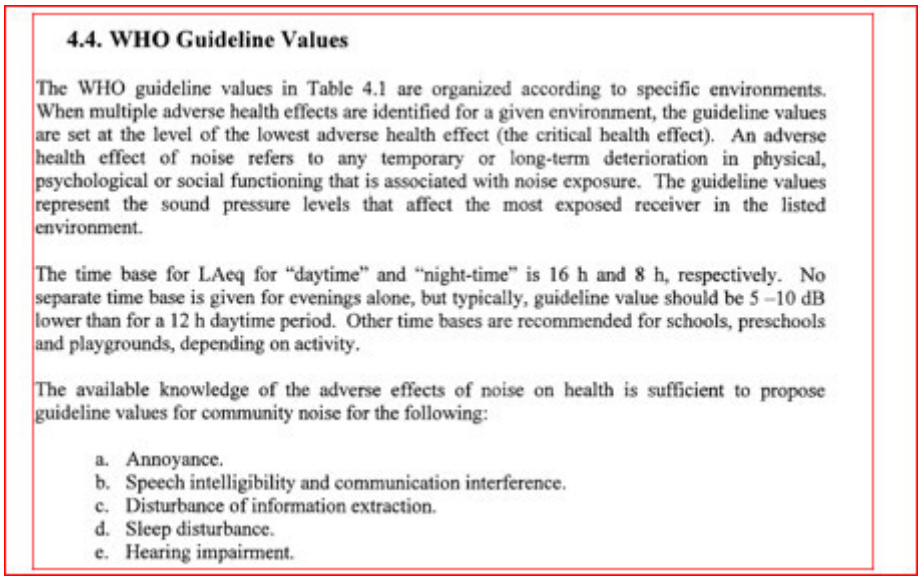
dwellings inside the scheme could afford to insulate a single window and install ventilation in every bedroom.

This is an assumed cost once again and the specifics of a scheme are not available. It is envisaged that daa will have a set of contractors selected, and the contractors will be responsible for the works and results. The applicant only refers to bedrooms, our living rooms and kitchens are areas of activity for reading , working etc. particularly with the

changes Covid has brought with working from home. This is aspirational and needs to be specified in full . This is in addition to the VDIS , so that than means that those with no insulation at present, who have deferred or still waiting, will have up to an additional amount of €20,000 added to the cost for their home to insulate every room, window, door and velux roof window. The scheme is very vague.

This scheme should be an additional to the current conditions when the North Runway opens leaving no flights on North runway from 11pm to 0700 am as per the conditions.

The scheme aspires up to 10db of a reduction in aircraft noise. When one looks at the longitudinal data received from daa in October 2018, this insulation will be considered useless to achieve a noise decibel level at night of 40db and 45db during the day.



4.4. WHO Guideline Values

The WHO guideline values in Table 4.1 are organized according to specific environments. When multiple adverse health effects are identified for a given environment, the guideline values are set at the level of the lowest adverse health effect (the critical health effect). An adverse health effect of noise refers to any temporary or long-term deterioration in physical, psychological or social functioning that is associated with noise exposure. The guideline values represent the sound pressure levels that affect the most exposed receiver in the listed environment.

The time base for LAeq for "daytime" and "night-time" is 16 h and 8 h, respectively. No separate time base is given for evenings alone, but typically, guideline value should be 5 –10 dB lower than for a 12 h daytime period. Other time bases are recommended for schools, preschools and playgrounds, depending on activity.

The available knowledge of the adverse effects of noise on health is sufficient to propose guideline values for community noise for the following:

a. Annoyance.
b. Speech intelligibility and communication interference.
c. Disturbance of information extraction.
d. Sleep disturbance.
e. Hearing impairment.

Following the grant of planning permission in 2007 and recommencement of the construction programme in December 2016, homes were identified within the 63 – 69db contour (Laeq) from the Oral hearing.

The Statement of Need completed a survey by Daa's Noise Consultants Anderson Acoustics.

The aircraft noise measurement – externally were measured under Laeq16hr (from INM Intergrated Noise Model) 2022 summer noise levels at dwellings.

Together with the external noise level from INM these have been used to estimate the overall sound insulation performance of the building envelope and the internal aircraft noise level using the method set out in BS EN 12354-3:2000 Upgrade measures have been applied with estimations of the subsequent improvement in sound insulation performance.

Where possible the daa Noise Insulation programme aims to achieve a 5 to 10 db improvement in sound insulation performance and to meet the World Health Organisation and BS8233:2014 recommended daytime internal ambient noise levels of 35to 40dB laeq16h within dwellings, depending on room type.

Anderson Acoustics (Contractor) for the applicant carried out a statement of need, for a home at Dunbro Lane, giving a reading of 62.6dB – just 0.4 below the 63dB . – externally.

At Dunbro , a mobile NMT conducted a test and reported 33% of aircraft at 72dB Lamax between 22July to 7th August at Dunbro Lane in 2019 . The average was 60-63dB laeq.

Note: The year 2018 was chosen for the EIAR and this application as a benchmark to project, analysis and assess future data for the INM software to produce assumptions to

work with for the purpose of North Runway. Why was 2019 not chosen, as more aircraft activity was recorded at Dublin Airport in terms of ATMs. was 2018.

[redacted] was initially not included in the VDIS and only added to the programme , following pressure from the residents originally left out of the programme. Clearly the 63dB contour included the area between the two runways following the grant of permission in 2007.

One household is awaiting a real time up to date noise measurement when the north runway becomes operational as the current VDIS is not suitable.

In 2006, Searson Associates, (Acoustic Engineer) for SMCRG using the same equipment as DAA in [redacted] in July-August 2019 conducted a noise measurement at one of the homes.

The readings revealed the Laf max meaurements that gave the true result.

This was taken prior to the Oral hearing using a Bruel & Kjaer real time analyser.

So the daa's data of real noise level is questionable and can be argued with as depending on interpretation of dBs and use of different noise metrics.

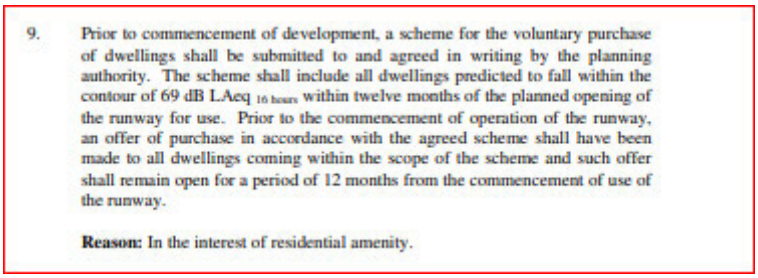
So taking into consideration the readings from 2006 , with the South Runway only in operation to the west, can daa

stand over their noise insulation programme , in its current form and specification for [redacted], and up to 3000 ft on the flight path.

VDPS - " Voluntary Home Buy out Scheme"

The extreme mitigation measure of offering a Home Buy Out Scheme to those adversely affected by 10L – 28R will be part of the NAO formulated with daa and ANCA. The Inspector was fully aware of the compromised and check-mate position those under the flightpath would find themselves in. The Board on receiving additional information did grant the planning for 10L-28R on the basis of restricted night flights to give a respite of 8 hours for sleep and rest and also allowing for a Home purchases buyout scheme which was to be totally voluntary.

We note in the analysis of the noise impact in the various aircraft noise metrics used, understate the impact - the effect is not significant (as daa are using the day time data , as if the runway is operating and extending it to night time. – based on the operation of North Runway.) The Lafmax and SEL are used very sparingly with 15 different noise metrics used in different formats and scenarios. So the impact of night time aircraft disturbance is being minimised.



9. Prior to commencement of development, a scheme for the voluntary purchase of dwellings shall be submitted to and agreed in writing by the planning authority. The scheme shall include all dwellings predicted to fall within the contour of 69 dB LAeq $_{16\ hours}$ within twelve months of the planned opening of the runway for use. Prior to the commencement of operation of the runway, an offer of purchase in accordance with the agreed scheme shall have been made to all dwellings coming within the scope of the scheme and such offer shall remain open for a period of 12 months from the commencement of use of the runway.

Reason: In the interest of residential amenity.

The VDPS was crafted by DAA and FCC – without the real and meaningful engagement of those whose homes were blighted in the flightpaths of the North Runway.

The VDPS was presented at a special CLG meeting in November 2016, signed off December 2016, the same day the pre-commencement works started on North Runway.

The Applicant has left this VDPS unchanged, apart from extending the period from one year to three years to accept their offer, from the date of operation of the runway.

This only benefits the Applicant and FCC as the runway is due to open next year in 2022. The Daa plan to lodge an application for expanding Dublin Airport from 32mppa to 40mppa in 2025 - 3 years from the opening of the runway.

During that time the flight path residents will be subjected to 16 hour ATMs on both runways with the current conditions adhered to .

Condition 9 also states:

Prior to the commencement of operation of the runway, an offer of purchase in accordance with the agreed scheme shall have been made to all dwellings coming within the scope of the scheme and such offer shall remain open for a period of 12 months from the commencement of use of the runway.

Reason: In the interest of residential amenity.

It is important to highlight, the runway is due to open for operation within the next 6-12months and again the daa have failed to engage with those adversely affected in any meaningful way. The daa scheme is totally rejected as it does not include the loss of a home, an identity, our deeply rooted past, and aspirations for the future. The health impacts of this causing huge distress , for fight path residents faced with a gun to their heads – to surrender their homes and disappear, like the 8 families forced from Barberstown and Kington in the 1960-1970s or live in a noise vacuum of aircraft noise.

Pondering on the words of Dalton Philips – Chief Executive of daa –

Whether it is one household or 200 households under the flightpath, I am really sorry for them, I really am, but that is a matter for them"

Speaking at a Oireachtas Joint Committee on Health on Wednesday 6th October, the Health Minister, Stephen Donnolly , stated , " *people do not resist change, they resist loss.* "

The loss in terms of detrimental significant health and well being is being considered as collateral damage, by daa who are fully aware of the significant impact, for a small number of the Fingal citizens , too small to matter, to Dublin Airport , in this EIAR.

Vortex Impact

13.3.37 The other potential effect from airborne aircraft vibration is vortex damage to buildings.

13.3.38 Aircraft in flight creates vortices, circulating currents of air that are shed from the aircraft wings. For the most part, these vortices are dissipated by the effects of the wind and atmospheric turbulence before they reach the ground and, whilst they may more often be heard after an aircraft has passed, they seldom have any physical impact at ground level. Occasionally, however, vortices may persist long enough to make contact with buildings underneath the flight path. In extreme cases, the variation in pressure within these vortices can cause some damage to roofs if tiles or slates are not sufficiently firmly secured. In practice, such events may be encountered due to the passage of larger wide-bodied jets which create the largest vortices and during landing when aircraft are relatively close to the ground.

13.3.39 The issue of wake vortex damage was considered in some detail in the 2004 EIS[29] that supported the application for the permitted North Runway. The previous EIS was based on an assumption of 348,358 movements per annum, significantly higher than the number now envisaged in 2025 for the proposed Relevant Action which is 236,000 movements per annum. In granting permission for North Runway under those assumptions, the wake vortex impacts of that number of operations was evidently

Chapter 14 gives details of another impact from airborne aircraft – vortex damage to buildings Roof tiles or slates may be damaged due to the passage of larger wide-bodied jets which create the largest vortices and during landing when aircraft is relatively close to the ground.

The noise level of 97dB C max occurring on average at least once over 24 hour day over the year has been taken as a threshold for potential significance of vibration effects due to airborne aircraft events.

This needs to be tested in real time, as the baseline threshold again is very high indeed and exceeding what is expected in DB levels take off or approach to North Runway.

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Vortex damage to house roofs from over-flying planes

There have been a considerable number of incidents where houses have been damaged by vortices, caused by planes flying overhead.

The reason is well understood. Planes cause turbulence in the air they fly through, and these can continue for some time, and descend to the ground, especially if there is little wind to break them up.

The effect is often that tiles or slates are sucked off roofs, and can then cause injury as they fall to the ground. The house holder is left with a damaged roof in need or urgent repair.

The airports see themselves as not being liable for the damage, and say it is up to the airlines to provide compensation.

However, at a number of airports, there is a scheme through which householders whose roofs are damaged can obtain prompt compensation.

Details of the **Birmingham Airport Vortex Protection Scheme and the VPS Leaflet.**

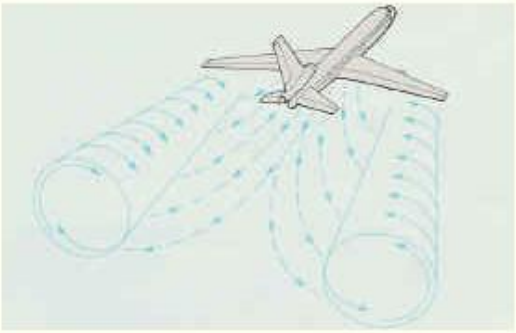
Details of the Manchester Vortex Protection Scheme.

The potential risk of vortex damage is very real . What will be the process , to report and make application in respect of damage caused by aircraft taking off and landing close to homes in that area to DAA - As this has been identified as a potential risk, provision must be made. There are a number of homes , close to the end of the runway.

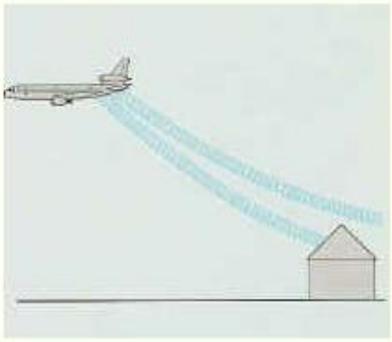
How the damage is caused:

On a clear day it is possible to see the path of an aircraft high in the sky, travelling to some far off destination. The path is clearly marked by a vapour trail that has a defined width, and remains in the sky for a long period after the aircraft has passed. The vapour trail is technically known as an aircraft wake vortices. At many hundreds of miles per hour, the strength of the vortices generated by the wings and fuselage cutting through the air, and added too by the thrust from the jet engines, are enormous.

The disturbance generates spiralling cones of air (the vortices), much like a tornado. The force of the vortices takes a long time to dissipate as there is little in the upper atmosphere to slow it down.



Closer to the ground large aircraft travel much slower, and the atmosphere is much thicker, so the vortices that are generated are less powerful and dissipates quicker. The most critical period is when a large aircraft is coming into land, when it is common for the aircraft wake vortex to reach the ground. The force of the vortex can suck tiles or slates off the roofs close to the flight path.



The main risk factors

The risks of being affected by an aircraft wake vortices can be assessed by looking at various know factors

- Is the location of the building under the flight path into a major airport or military air base? The flight path can be up to 10 degrees either side of the centre line and up to 6Km from the touchdown point.

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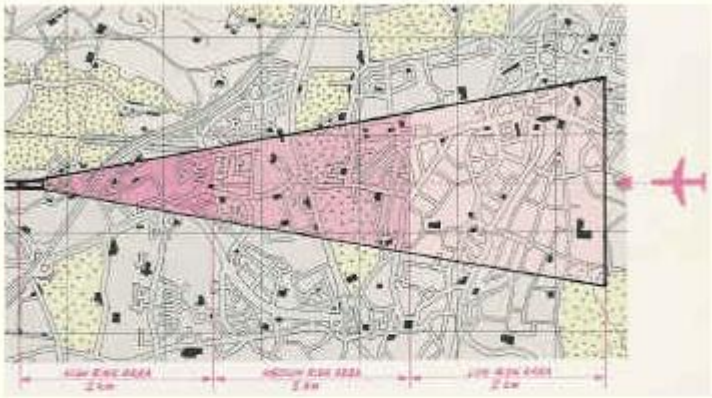

- The direction of landing. More damage is created by aircraft coming in to land than taking off, due to the shallow rate of decent, relative to the steep rate of climb when taking off. Coming in to land the aircraft are lower beyond the end of the runway

- The size and weight of the aircraft, and the speed at which they land can make a big difference. It is the wide-bodied aircraft that record the most strikes, as there are more surfaces on the aircraft to generate the vortices.

- The weather conditions have a major effect. Windy and wet weather breaks up the structure of a vortex quicker than still clear conditions.

Vortex strikes

Unlike hurricane force winds, which affect the perimeters of a roof (especially the ridge and verge), aircraft wake vortices damage occurs in the centre of a roof slope, as the edges of the roof break up the vortices rather than help it. The average vortex is approx. 500mm wide, will travel at about 5 Knots, and last for approx. 3 minutes in clear air. Once it comes into contact with a roof, the vortices can exert their total force of up to -1200N/m² on just one or two slates or tiles for a fraction of a second, before they break up and loses their energy. If the tiles or slates are not fixed securely, the sucking and twisting action of the vortices can lift them out of place.

Fixing specification

To resist the force of the vortices it is essential that the tiles and slates can not lift at the tail of the tile or slate, and can not rotate. This can be achieved with tiles by being head nailed to the batten and tail clipped with a rigid clip. The smaller the tiles the more fixing can be installed per square metre of roof. Plain tiles should be fixed with either ring shank nails with a thick strong nail head or screwed. For double lap slate, centre nailing with ring shank nails should be adequate.Roofs clad with metal sheeting or built up systems do not appear to be vulnerable to aircraft wake vortices damage as the small footprint of a vortex relative to the large surface area of the panel will allow the load to spread to a greater number of fixings.

Program of repairs

The existing roofs that are under the flight path into major UK airports, starting with London Heathrow, are likely to be subject to a planned or programmed roof replacement scheme. However for all new buildings under a flight path it is the responsibility of the designer/ specifier to ensure the correct fixing specification is used to ensure no roof damage is caused by the effect aircraft wake vortices. In most instances the airport authority will be able to advise if the size of aircraft using the airport is an issue, and the exact line of the flight paths. With this information, the assistance of the roof tile or slate manufacturer should next be sought to determine the correct fixing specification for the roof.

This potential risk of damage to our homes must be assessed fully and residents assured of a planned or programmed roof replacement scheme for North Runway.

SUMMARY

We are appealing to the Planning Authority and ANCA to respect the planning permission F0A.1755 -PL06F217429

For the health and well-being of the flight path residents and those parallel to the runway

To refuse this application on the grounds, those most adversely affected have been disregarded.

The Concerns of affected Fingal citizens , struck between the runways must not be minimised and all their concerns and issues dealt with recognition, respect for them as human individuals not just labelled as dwellings or receptor reference numbers as with those under the flightpaths.

The Conditions imposed by ABP in August 2007 should remain in place , in full.

Meaningful engagement is required for those directly affected by airport development, runways and flightpaths now and for the future.

References:

Irish Civil Aviation - Aircraft Noise, sleep disturbance and Health effects - CAP1164 2014.

AEF – Aircraft Environmental Federation UK - Data on Health and Aircraft Quota System

Aircraft Noise (Dublin Airport) Regulations Act 2019

Searson Associates - Northern Parallel Runway – Likely Impact on residents of Kilreesk Lane.

WHO Guidelines 2019

NAP – Noise Action Plan 2018 – 2023.