



# Annual Compliance Report 2020



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## Introduction

The Aircraft Noise (Dublin Airport) Regulation Act 2019, Part 4, section 19 states that the airport shall on or before each anniversary of the date of commencement of this section, prepare and adopt a report in writing in the specified form on the compliance of airport users with noise mitigation measures and operating restrictions.

daa have drafted a compliance report in accordance with the Act for the calendar year 2020 (1<sup>st</sup> Jan – 31<sup>st</sup> Dec) that is based on the requirements listed and report improvement correspondence received from the ANCA in 2020 and 2021.

The report is structured to set out the roles and responsibilities of stakeholders followed by a non-technical summary and description of noise mitigation measures in place at the airport. Further detail on wider community engagement, complaint metrics, noise contour maps and the performance of the noise monitoring terminals in place at the airport is then provided.

Further sections examine the Dublin Airport operation in 2020, focusing on its traffic management and distribution. The report outlines the operating restrictions in place at the airport and provides a review of flight operations procedures and assessment of the fleet mix which could relate to noise. Final sections of the report provide an assessment of the airport's compliance with operating restrictions and the noise mitigation measures in place with proposals to avoid or reduce the failures of compliance.

## Key Roles & Responsibilities

### *Dublin Airport*

Dublin Airport's role within the Aircraft Noise Regulation Act is to ensure appropriate measures are in place for all airport users to comply with applicable noise mitigation measures.

### *NFTMS Team*

The Noise and Flight Track Monitoring Systems team is a sub-group of the Infrastructure Energy, Environment and Utilities Management section at Dublin Airport. Its main roles include:

- Noise systems management (ANOMS, WebTrak Community Engagement tool and Noise Monitoring terminals)
- Track Keeping
- Complaint handling
- Regulatory and internal reporting of noise related matters
- Submission of noise related proposals to the IAA-ANSP for the update of the Aeronautical information Publication
- Update of the relevant aerodrome manual directions related to noise mitigation measures
- Support to relevant group sections for community engagement purposes

### *Airport Users (Airlines etc)*

An airport user means a person responsible for the carriage of passengers, mail, or freight by air to or from the airport. By operating into and out of Dublin, all airport users must comply with the information set out in the Aeronautical Information Publication.

### *IAA-ANSP*

The IAA-ANSP is the Irish national supervisory authority responsible for overseeing and regulating all aspects of civil aviation in Ireland.

### *ANSP*

The Air Navigation Service Provider (ANSP) is responsible for the safe co-ordination of air traffic arriving into and departing from Dublin. The ANSP function is carried out by the Irish Aviation Authority.

### *ANCA*

The Aircraft Noise Competent Authority (ANCA) is the competent authority for the purposes of the Aircraft Noise Regulation.

## Non-Technical Summary

2020 was one of the most difficult periods in Dublin Airport's history, as the global COVID-19 pandemic had a devastating impact on our people and on our business. No part of Dublin Airport's operation was unaffected by COVID-19. Passenger traffic at Dublin Airport declined from 32.9 million in 2019 to just over 7.39 million last year – a fall of over 77%. Movements similarly declined by over 62% over the same period. Dublin Airport had experienced a positive start to the year before the advent of COVID-19, with increased passenger numbers as evidenced by our busiest day flight track graphs. Noise flight track monitoring and the wider track-keeping and complaints handling was largely maintained over the period and indeed Dublin Airport commenced the implementation of enhanced noise monitoring systems and improved community engagement tools. Instances of reduced performance in complaints handling and delayed review of the existing noise monitoring terminal system are apparent, however focus remains on ensuring a return to the previous high standards of compliance and implementation.

In 2020, Dublin Airport facilitated 87,205 aircraft movements (landing or take-off). Most of the movements were conducted using Boeing 737-800 series aircraft (40.4%). Over 94.3% of aircraft using Dublin Airport in 2020 were aircraft of Chapter 4 classification or better.

The airport is licensed to operate 24 hours per day and in 2020 14.03% percent of movements took place during the night (23:00- 07:00). Runway 10/28 is operated as the primary runway, facilitating 98.6% of the movements in 2020. High usage of the primary runway is preferential in terms of noise impact, since its flightpaths traverse less populated areas than runway 16/34, whose flightpaths to the south are located over areas of Dublin. The operational decisions, as side from safety, that determine any use of the crosswind RWY 16/34 are described. The typical annual frequency and instances use of RWY 16/34 provide insight into the maintenance and essential repairs works required.

Dublin airport has several noise mitigations measures in place such as the above-mentioned preferred runway usage, limitations on reverse thrust usage, departure procedures and environmental corridors. Jet airliner aircraft (category C/D) are required to fly within these environmental corridors, which are based on the runway take-off flight path areas. Compliance figures for the noise abatement operating procedures are provided where possible and referenced against the preceding year. Where monitoring and measurement of any operating procedure was not undertaken within 2020, specific narrative is provided to detail, where technically feasible and possible, appropriate steps are underway to ensure full compliance.

The airport maintains and operates a Noise and Flight Track Monitoring System (NFTMS), consisting of 7 Noise Monitoring Terminals (NMT's), which are installed in the area around the airport. The results from the system are used to report on noise levels around the airport and where possible to investigate track keeping against the noise abatement operating procedures. In 2020 the NMT's were operational 99% of the time. The NMT's located directly under the flight paths of runway 10/28 (NMT 1, 2 and 20) recorded 114,094 noise events associated with aircraft .

Graphs of  $LA_{max}$  noise levels are presented for each NMT in the *Noise Mitigation Measures at Dublin Airport* section.

For 2020 99.14% of aircraft operated in accordance with track keeping rules in place. Failures by airport users to comply with noise mitigation measures involves aircraft flying off track and therefore breaching the environmental corridor without being directed to do so by the IAA-ANSP. In 2020, 96 queries were sent to the IAA-ANSP, Air Traffic Service Unit (ATSU) for investigation. Parameters and criteria outlining the determination of a non-compliance or violation of track keeping rules as well as the methodology for issue to the IAA-ANSP is set out and provided in a flowchart format.

Dublin Airport does keep track of these breaches in the NFTMS (the IAA-ANSP does not employ real-time access to the NFTMS). The NFTMS recorded 652 infringements/breaches of the environmental corridor in 2020. This means over 99.14% of all category C/D movements complied with the environmental corridor.

Dublin Airport also commenced assessing the use of environmental charges. Mott MacDonald Consultancy have been appointed to deliver a noise charging methodology solution. Assessment has initially involved a review of existing charging models and a benchmarking exercise of UK and European airports noise charging. Existing daa noise data including previous research and noise analysis works has aided the identification of basic requirements and will allow Mott MacDonald to create a valid noise charging model through 2021. On completion and review the necessary period of adjustments and consultation will begin with the airport users and relevant regulatory bodies such as the Commission for Aviation Regulation (CAR), IAA-ANSP and the ANCA. This consultation will demonstrate the methodology and principles of the model ahead of any execution into the relevant IT system software and billing engines. Further updates on the progress towards the implementation of environmental noise charging will be provided to stakeholders over the course of consultation. The consultation will be undertaken in accordance with the European Communities (Dublin Airport Charges) Regulations 2011. The charges are likely to be agreed by November 2021 pending any 2022 price cap Decision by CAR.

The movements of aircraft by aircraft type referenced against 2019 along with detail on the ICAO chapter compliance set out how the majority of aircraft at Dublin Airport remain the quietest type.

The noise contour maps completed for 2020 set out the modelled noise impact of aircraft operations for the various standard noise metrics as well as a comparison of the Annual  $L_{DEN}$  Noise levels for 2019 and 2020. As expected, all of the 2020 contours are smaller than their 2019 equivalents. This is due to the large reduction in movements in 2020, as a result of the COVID-19 pandemic.

Significant system upgrade and improvement works have been commenced within 2020 that will see Dublin Airport improve its noise flight & track keeping capabilities throughout 2021. These improvements include:

- WebTrak Community engagement tool
- Environmental Noise corridor review and validation of alignment with Aeronautical Instrument Procedures
- Upgrade of the existing Noise Desk system to the ANOMS
- Review of all existing Noise Monitoring terminals, background noise levels and duration settings
- Daily data grooming of all noise data from noise monitoring terminals
- Airport Directions review

- Commencement of Environmental Noise Charges review and consultation with airport users and regulatory bodies.
- A comprehensive technical review and response to ANCA's Benchmark Assessment for additional Noise Monitoring terminals and community engagement has been commenced.

## Noise Mitigation Measures at Dublin Airport

The noise mitigations in place at Dublin Airport are set out below in Table 1. The mitigation measures are aligned by type with the relevant elements of the ICAO balanced approach.

Item	Ref	Description	Source	ICAO Balanced Approach Element
1	NS-1	Encourage daa to work with airline partners to introduce quieter aircraft, particularly at night – including consideration of incentives	FCC-NAP	Reduction of Noise at Source
2	NS-1	Encourage daa to promote quieter aircraft through incentives such as FlyQuiet programmes.	FCC-NAP	Reduction of Noise at Source
3	NA-1	Two Runway Preferential Runway Programme	FCC NAP; daa NMP; AIP;	Reduction of Noise at Source
4	NA-2	Two Runway Noise Preferential Routes (NPR's) and Track Keeping	FCC NAP; daa NMP; AIP;	Reduction of Noise at Source
5	NA-3	Noise Abatement Departure Procedures (NADP) Climb Profile	FCC NAP; daa NMP; AIP;	Noise Abatement Operating Procedure
6	NA-4	Visual Approach Jet Aircraft (Cat C/D)	FCC NAP	Noise Abatement Operating Procedure
7	NA-5/6	Continuous Climb Operations / Continuous Decent Approach	IAA ATC	Noise Abatement Operating Procedure
8	NA-7	Reverse Thrust	FCC NAP; daa NMP; AIP;	Noise Abatement Operating Procedure
9	NA-8	Engine Ground Running	FCC NAP; daa NMP; AIP;	Noise Abatement Operating Procedure
10	NA-9	Monitor and Report	FCC NAP; daa NMP;	Noise Abatement Operating Procedure
11	LU-4	Sound Insulation (RNIS)	FCC NAP; daa NMP;	Land Use & Planning Management
12	LU-6	Voluntary Dwelling Purchase Scheme	NR - RFI 116	Land Use & Planning Management
13	LU-7	Voluntary School Sound Insulation	NR - RFI 116	Land Use & Planning Management
14	CE-1	Stakeholder Engagement	FCC NAP; daa NMP;	Monitoring & Community Engagement
15	CE-2	Community Engagement Programme	FCC NAP; daa NMP;	Monitoring & Community Engagement
16	CE-3	Noise & Flight Track Monitoring System	FCC NAP; daa NMP;	Monitoring & Community Engagement
17	CE-4	Noise Complaint Management Systems	FCC NAP; daa NMP;	Monitoring & Community Engagement

**Table 1 – Noise Mitigation Measures at Dublin Airport**

Aircraft operators are instructed to ensure that, at all times, aircraft are operated in such a way as to cause the least disturbance practicable in areas surrounding the airport. A description of the specific noise abatement operating procedure measures is set out below.

### *Two Runway Preferential Runway Programme*

This noise mitigation sets out how, where possible, runways are to be used to enable aircraft avoid noise-sensitive areas during the initial departure and final approach phases of flight. Runway 10 or Runway 28 is the required runway between 06:00hr and 23:00hr local time when the crosswind component is 20KT (knots) or less. Runway 28 will be the preferential runway when the tailwind



component is 10KT (knots) or less and braking action is assessed as good. Aircraft are required to use these runways except when operational reasons dictate otherwise.

If the crosswind component on Runway 10 or Runway 28 is greater than 20KT (knots), Runway 16 or Runway 34 may become the active runway. If the forecast crosswind component on Runway 10 or 28 is greater than 20KT (knots), Runway 16 or 34 may become the active runway. The use of Runway 16-34 shall be kept to an absolute minimum subject to operational conditions and IAA-ANSP direction. Runways will be prioritised for noise abatement purposes between 23:00 and 06:00hr local time, subject to the same wind calculation method and values as used between 06:00 and 23:00hr local time. When weather conditions and flight movements permit, runway usage will be prioritised as follows:

Arrivals: #1 (Runway 10), #2 (Runway 16), #3 (Runway 28), #4 (Runway 34)

Departures: #1 (Runway 28), #2 (Runway 34), #3 (Runway 10), #4 (Runway 16)

#### *Two Runway Noise Preferential Routes and Track Keeping*

Disruption is minimised by routing aircraft away from built-up areas, where and when possible. Unless directed otherwise by IAA-ANSP, all aircraft taking off from Dublin Airport will follow specific Noise Preferential Routes (NPR's), otherwise Environmental Noise Corridors. The NPRs are built to avoid and mitigate overflight of built-up areas. Aircraft flying inside the NPR corridors are deemed to be flying on-track. Once an aircraft reaches the end of the NPR, or is at an altitude of 3,000 feet, IAA-ANSP will vector the aircraft onto a more direct heading to its destination. Safety and environmental considerations may dictate that IAA-ANSP can turn aircraft off NPRs below 3,000 feet. Any off-track violations that constitute a complaint are investigated directly by daa and IAA-ANSP.

Aircraft must not leave their respective Environmental Corridor below 3,000ft above mean sea level or during the first 5 nautical miles while using Runways 28, 16 or 34. Departures from Runway 10 must track the runway extended centreline to 5NM before commencing turn to the north, or to 6NM before commencing turn to the south. Departures from Runway 10 can be vectored by IAA-ANSP once above 3,000ft and over the sea. The corridors also apply for approaches to the reciprocal runway. The Environmental Corridors do not apply to Category A/B aircraft (light aircraft, turbo prop).

The corridors have a width of 180 metres at the departure end of the clearway, diverging at 12.5% on each side to a maximum width of 1.8km. Departures from all runways except Runway 10, must track the runway extended centreline after take-off to 5NM before commencing turn, unless otherwise cleared by IAA-ANSP 3000ft above mean sea level (AMSL). Departures from Runway 10 must track the runway extended centreline to 5NM before commencing turn to the north, or to 6NM before commencing turn to the south. For departures from runway 10, there is no upper vertical limit to the corridor.

#### *Noise Abatement Departure Procedures (NADP) Climb Profile*

NADP climb profiles are operating procedures setting out rates of climb etc. to a clean configuration speed. The procedures are intended to be beneficial in noise terms for noise-sensitive areas either in proximity or more distant from the airport. There is no comment within the guidance to designate what is in proximity or more distant. Dublin Airport maintains a hybrid NADP climb profile within the AIP for 2020.

### *Visual Approach Jet Aircraft*

Jet aircraft (Cat C/D) on visual approach to Runways 28L, 10R, 16 and 34 must join final approach no closer than 6NM from touchdown. Aircraft must follow a descent path which will not result in being at any time lower than the approach path which would otherwise be followed using the ILS glide-path.

### *Continuous Climb Operations/Continuous Descent Operations*

Continuous climb operation along a standard departure procedure is intended to limit interruption of the climb profile to cruise altitude and reduces the noise experienced on the ground caused by thrust levels required to keep aircraft level and increases distance from noise-sensitive areas between an aircraft and receptor(s) as soon as possible.

Continuous descent are operations that reduce the noise experienced on the ground by reducing the overall thrust required during the initial descent and keeping aircraft at higher altitudes for a longer period of time.

### *Reverse Thrust*

Reverse thrust is thrust projected in the opposite direction to normal and is used to decelerate an aircraft after landing, in the event of a rejected take off or otherwise. Reverse thrust should not be used during landing operations on any runway between 23:00- 06:00, except where operational or safety reasons dictate otherwise.

### *Engine Ground Running*

Engine test runs are a normal part of the operations at Dublin Airport. Engine test runs must be carried out after heavy maintenance takes place on an aircraft to comply with international safety regulations. There are strict conditions that govern high powered engine test runs that take place at Dublin Airport. While technological advances in aircraft engine design mean that modern aircraft have a lower noise impact than older aircraft, we are very aware that noise impacts still exist and so there are strict controls on when engine test runs may be undertaken. Engine test runs are not permitted between 2000hrs and 0700hrs. All aircraft types may undertake testing between 0900 and 2000hrs, and only aircraft up to Code C may undertake engine testing between 0700 and 0900hrs requirement within aerodrome Manual, Direction 6.10 and mandated within the AIP.

### *Monitor & Report*

Strict compliance with SID is mandatory and is monitored by measuring compliance with environmental corridors.

Large aircraft (Category C/D) are required to fly within the environmental corridors which are based on the runway take-off flight path areas. Figures 6,7 provide an overview of these corridors. The corridors have a width of 180 metres at the departure end of the clearway, diverging at 12.5% on each side to a maximum width of 1.8km. Departures from all runways except Runway 10, must track the runway extended centreline after take-off to 5NM before commencing turn, unless otherwise cleared by ATC 3000ft above mean sea level (AMSL). Departures from Runway 10 must track the runway extended centreline to 5NM before commencing turn to the north, or to 6NM before commencing turn to the south. For departures from runway 10, there is no upper vertical limit to the corridor.

The corridors also apply for approaches to the reciprocal runway, except for circling approaches. The Environmental Corridors do not apply to Category A/B aircraft (light aircraft, turbo prop type aircraft).

### Complaint Metrics

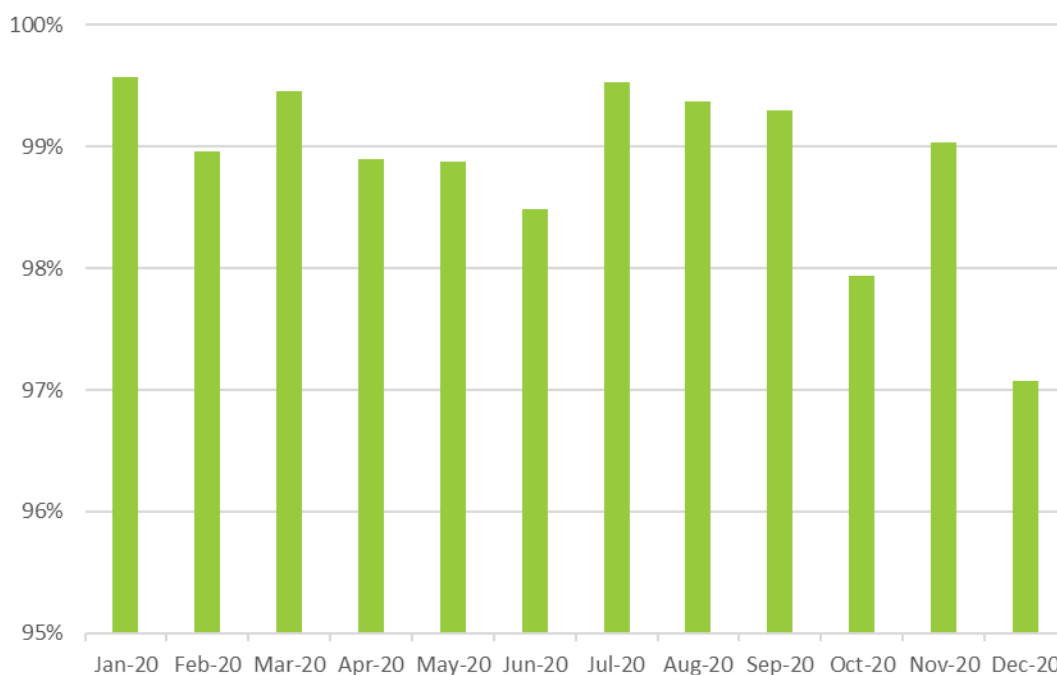
In 2020 112 people complained about 7,133 aircraft noise events. This represents a reduction on 2019 when 284 people lodged 15,160 complaints. In 2020 two people were responsible for logging 6,821 complaints which was 95% of the total complaints received. The vast majority of the complaints received concerned the main runway, Runway 10/28.

Description	2020	2019
Complaints	7133	15160
Complaints acknowledged/responded to	7133	15160
Referred to IAA-ANSP	96	56
IAA-ANSP Further Investigation Completed	39*	56

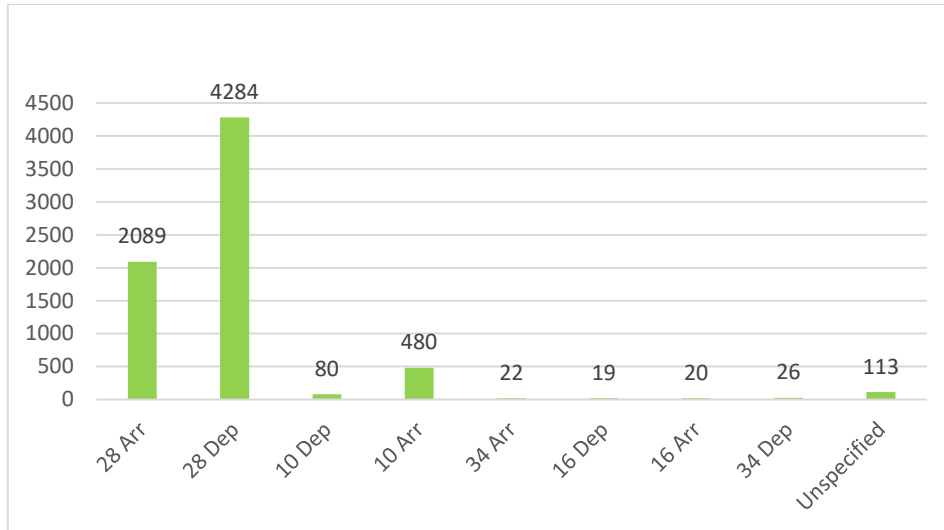
**Table 2 – Complaint statistics**

\*Processing time for complaints disrupted by COVID work restrictions.

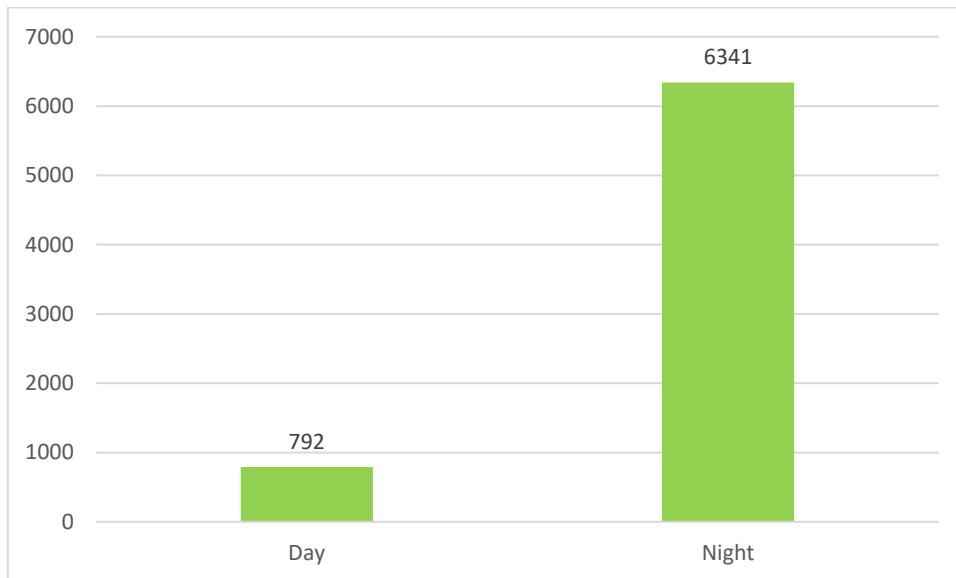
Figures 1-5 below set out various complaints metrics for 2020 and provide more detailed review of performance.



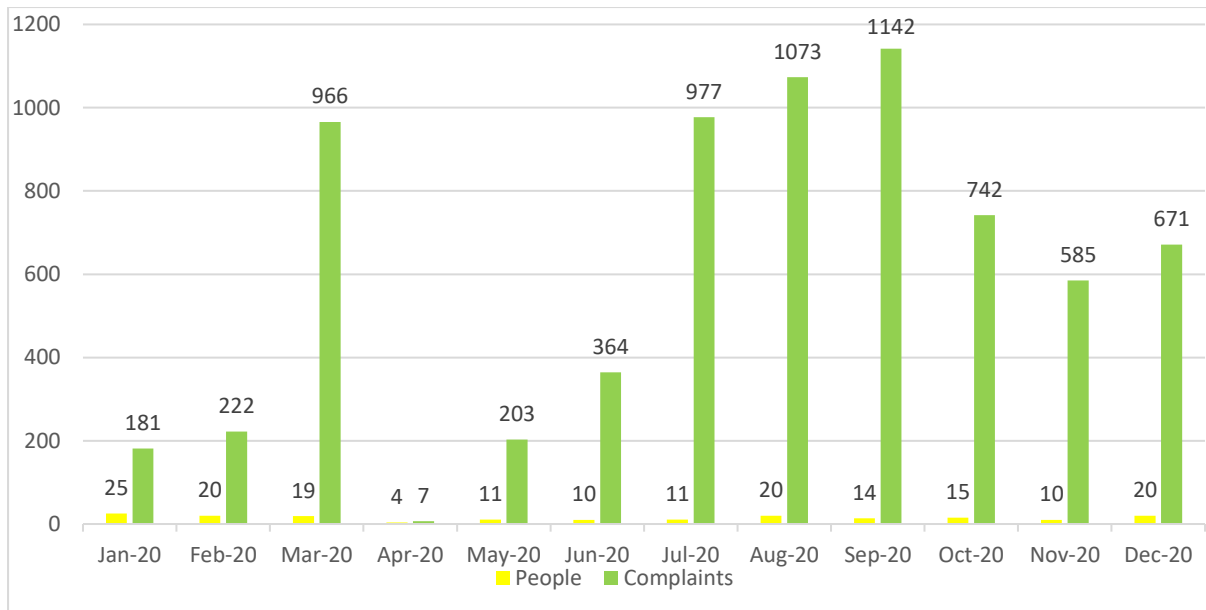
**Fig. 1 - Category C/D Aircraft On Track Performance 2020**



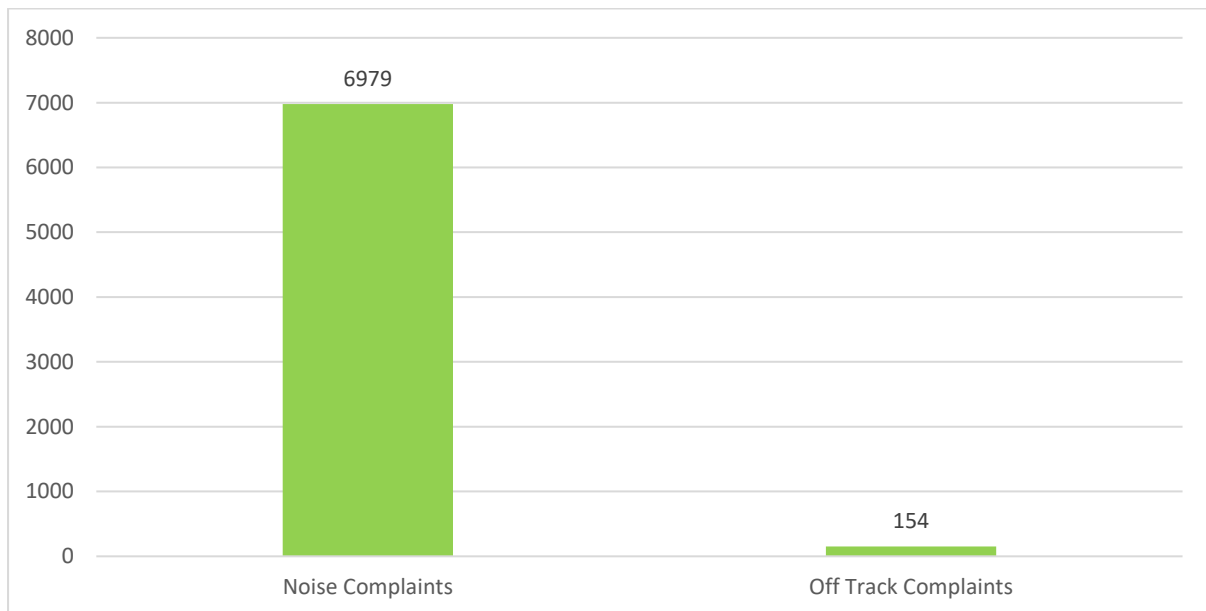
**Fig. 2 - Noise Complaint Analysis by Runway 2020**



**Fig. 3 - Day / Night Noise Complaints 2020**



**Fig. 4 - Noise Complaint Analysis 2020**



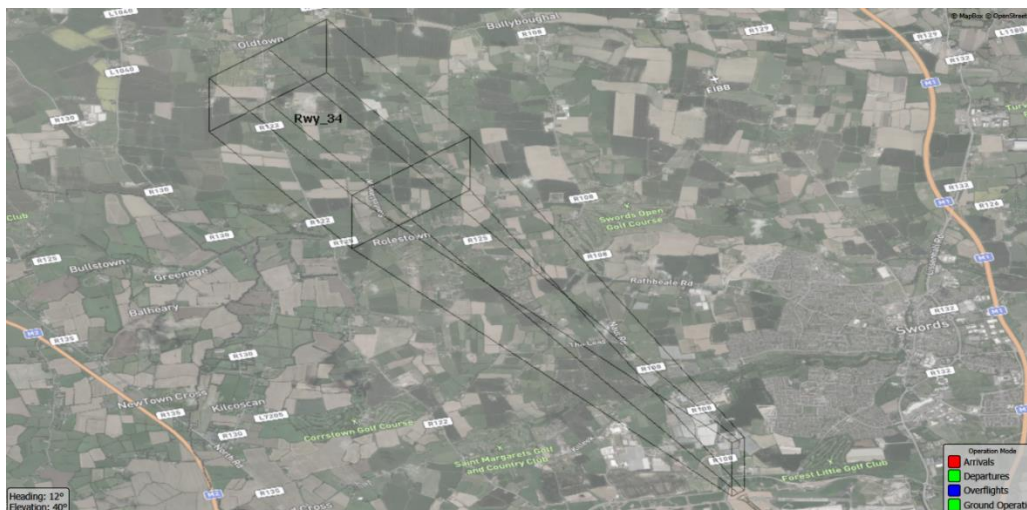
**Fig. 5 - Noise Complaints Versus Off Track Complaints 2020**

Of the 96 complaints forwarded to the IAA-ANSP for further investigation 39 have been processed. 37 no. of the complaints are marginal violations of the Environmental Noise Corridors that can be accounted for by system tolerance levels while 2 no. are related to weather conditions.

With the introduction of the new ANOMS Noise and Track system into daa, the primary focus has been on validating and consolidating the noise mitigation rule set that will allow improved monitoring, measurement, and reporting. During 2020 review of the existing system of noise gates that formed the basis of the environmental noise corridors has commenced. This review will see the refinement of the corridors to ensure full alignment with the noise abatement operating procedures set out in the AIP.



**Figure 6 – Environmental Noise Corridor**



**Fig. 7 – Environmental Noise Corridor**

**Violation’s insights**

The figures below outline specific insights into the instances of violations of flight track keeping at Dublin Airport throughout 2020.

Track keeping violations refer to breaches of the Environmental Noise Corridors and relevant other rules as set out in the AIP. For context against overall airport activity the count of overall movements per hour at Dublin Airport is provided as the figures representing track violations below refer to Cat C/D aircraft only. Current Continuous Climb Operation (CCO) and Continuous Decent Approach (CDA) procedures are under IAA-ATC control and are monitored by EUROCONTROL. Graphical representation of CDA violations is provided in Appendix G. The introduction of appropriate rules within Dublin Airport monitoring systems has allowed the measurement of such procedures but requires further discussion with IAA-ANSP to ensure accuracy relevant to IAA-ATC specific details.

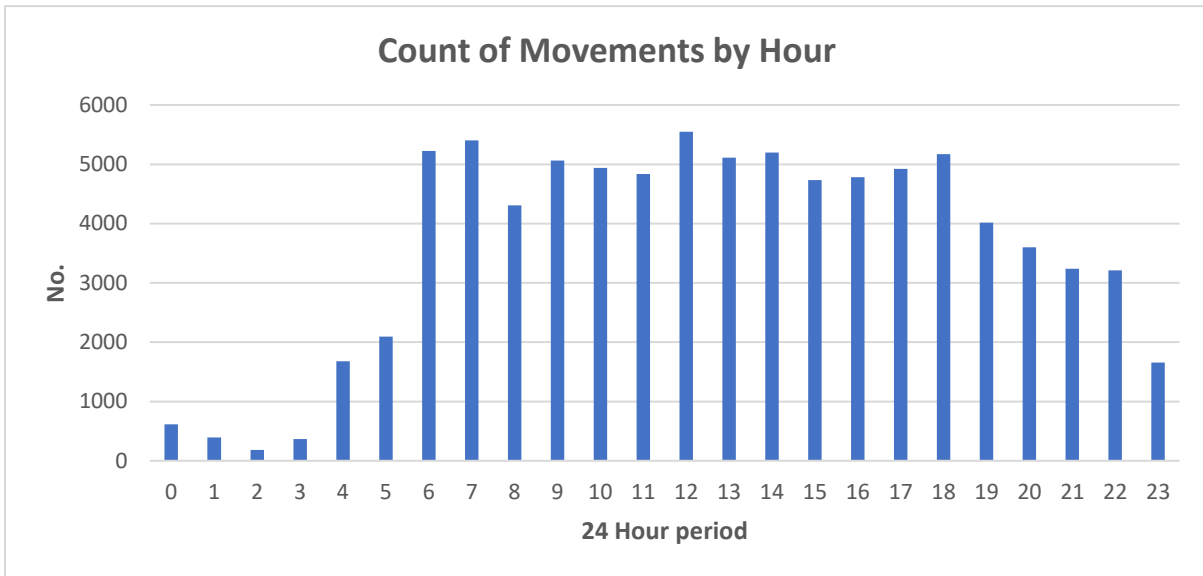


Fig. 8 – Movements by Hour

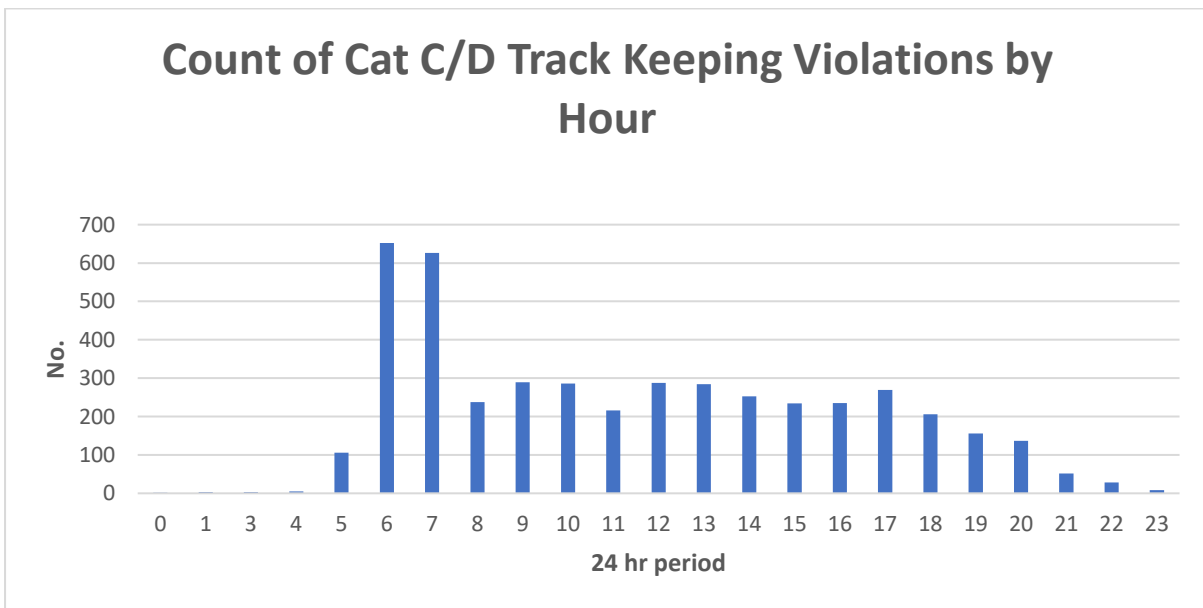
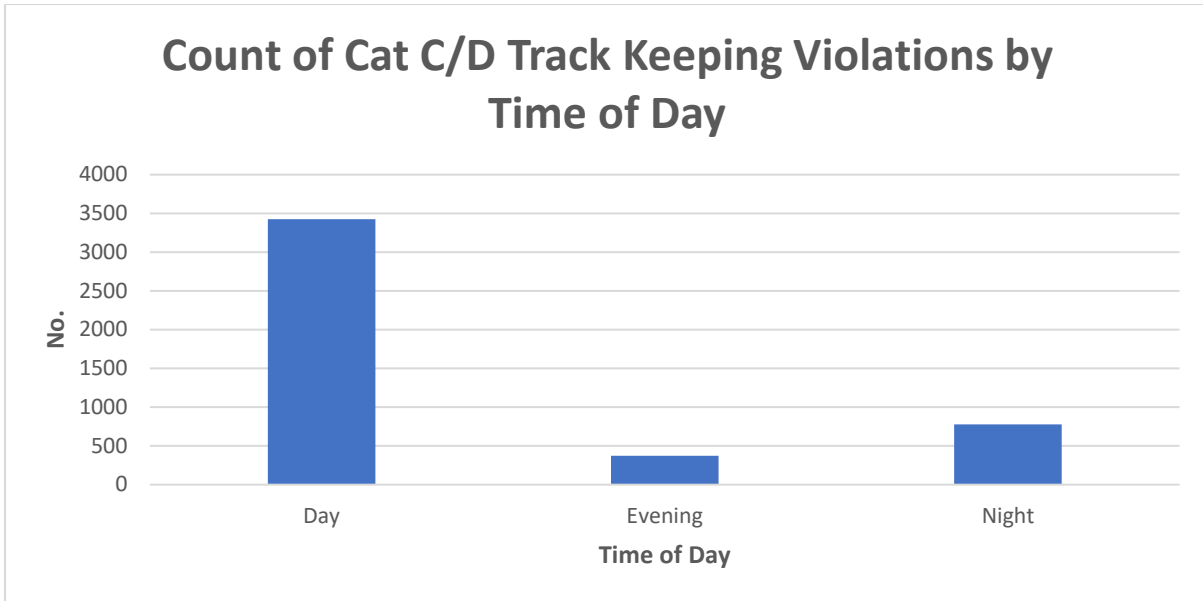


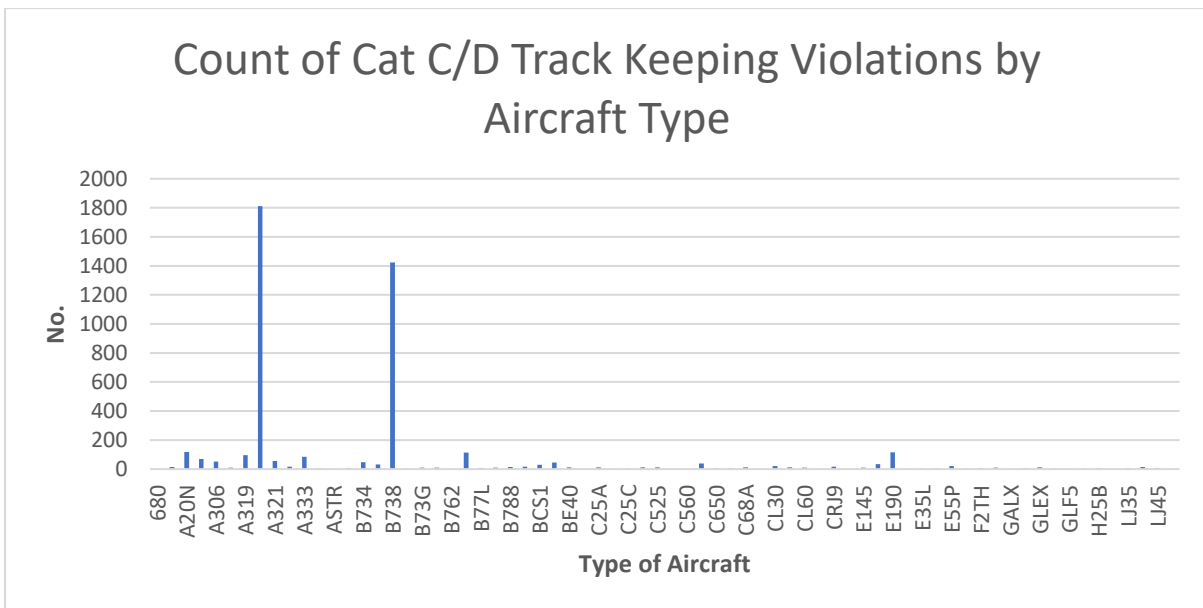
Fig. 9 – Violations by Hour

The alignment of violations by hour with the first wave of departures from Dublin Airport is consistent with the movements per hour outlined in Fig. 9 and further outlined in the time-of-day graph in Fig. 8.



**Fig. 10 – Violations by Time of Day**

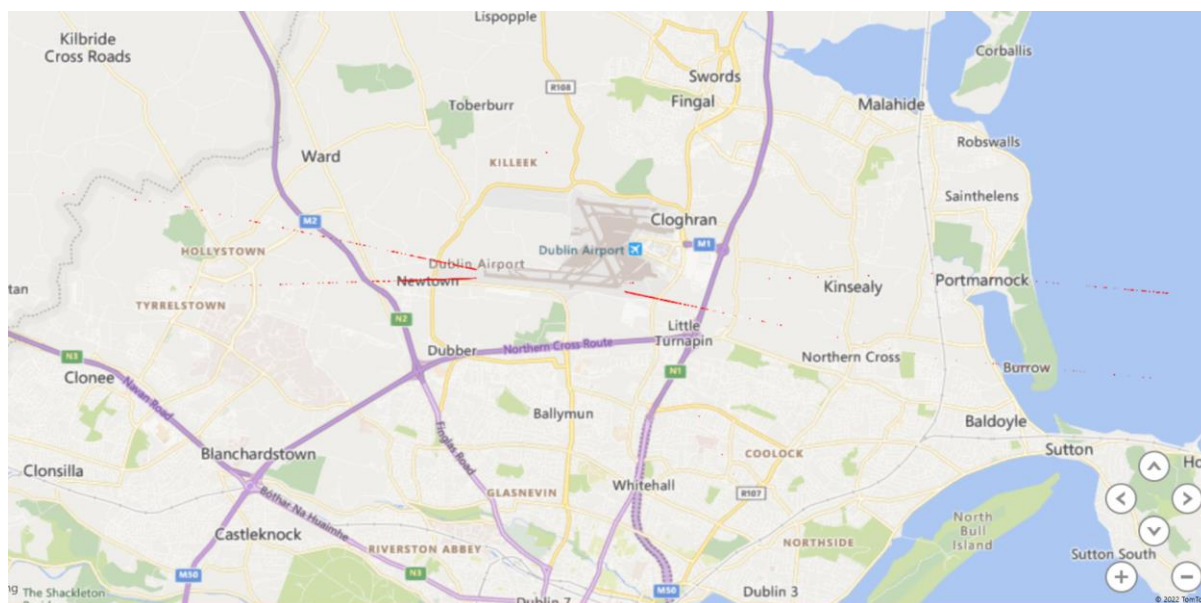
While the insights provided are not unexpected, they do serve to highlight the importance of early morning operations to airport users and a possible area for further engagement and improvement.



**Fig. 11 – Violations by Aircraft Type**

As Fig. 11 suggests the majority of violations are correlated with the aircraft operated by the largest carriers based at Dublin Airport.





**Fig. 12 – Locations of violations**

The location of identified violations is detailed in Fig. 12 above. Each of the red dots represents the point at which a corridor violation of CAT C/D aircraft occurred. It is worthwhile noting that a number of the violations occur within the boundary of the airport and are likely to have merged back into the environmental noise corridor prior to exiting the boundary of the airport. Under the rules of the AIP these infringements still represent a violation and are counted as such.

### Noise Monitoring

Dublin airport's Noise & Flight Track Monitoring Service consists of 7 Noise Monitoring Terminals (NMT's), which are installed in the area around the airport. The current system is provided by Envirosuite, with a new Noise & Track Monitoring System having been commissioned by daa in 2020 to improve the performance of noise monitoring at Dublin Airport.

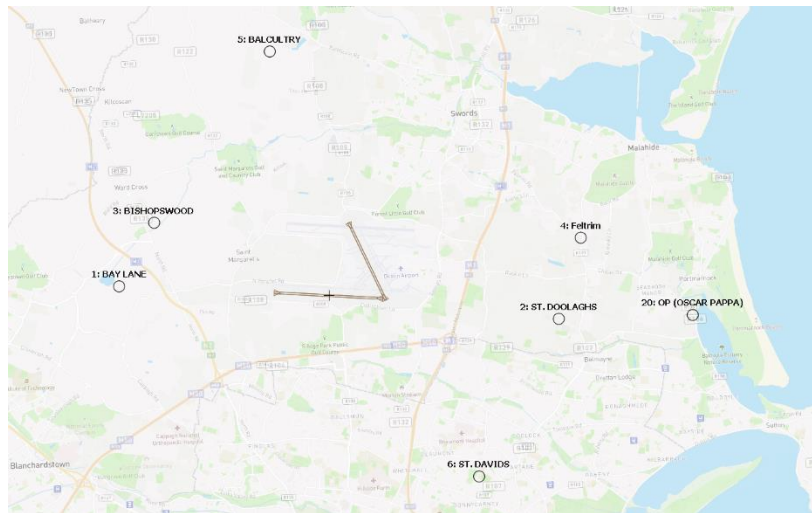
The NMT's are set to record continuously and to trigger a noise event when two conditions are met. The first condition is the noise threshold level. The noise threshold level needs to be exceeded before recording is initiated. The noise threshold levels are continuously adjusted by the system to ensure maximum correlation between noise and individual operations. The second condition is the length of the recorded noise event. The recorded noise event should last for at least 10 seconds. Due to its proximity to agricultural, roads, and/or urban areas, NMT's can be triggered not just by aviation noise. It is for this reason the system is designed to correlate a noise event with an aircraft departing or landing. Similarly, the system can detect when the noise originates from a weather event, such as thunder or other stormy conditions.

Figure 13 shows the locations of the NMT's in 2020.

- NMT 1: Bay Lane, monitoring runway 28 departures and runway 10 arrivals.
- NMT 2: St. Doolaghs, monitoring runway 10 departures and runway 28 arrivals.
- NMT 3: Bishopswood, monitoring the local area.
- NMT 4: Feltrim, monitoring the local area.
- NMT 5: Balcultry, monitoring runway 34 departures and runway 16 arrivals.
- NMT 6: Artane, monitoring runway 16 departures and runway 34 arrivals.

- NMT 20: Coast Road, monitoring runway 10 departures and runway 28 arrivals.

Figure 13 below shows the location of the noise monitoring terminals in 2020. Refer to Appendix D for further detail.



**Fig. 13 – Location of NMT's in 2020**

### Noise Management Procedure

The flowchart in Fig. 14 sets out the process and methodology whereby members of the public can make a complaint regarding aircraft noise and how such complaints are investigated by Dublin Airport. Additional information is available in Appendix F.

In particular, the criteria applied in determining whether any complaints, non-compliances or violations are issued to IAA-ANSP is set out. Effectively, the NMTMS analyst will analyse the flight in question to determine if an aircraft has breached the environmental noise corridor. Correspondence with the IAA-ANSP will then be initiated as set out in the flowchart in order to determine the details and specific vector information for the flight details of the breach. Receipt of answer from IAA-ANSP will determine whether further engagement with the relevant airport users is required prior to an official response being issued.

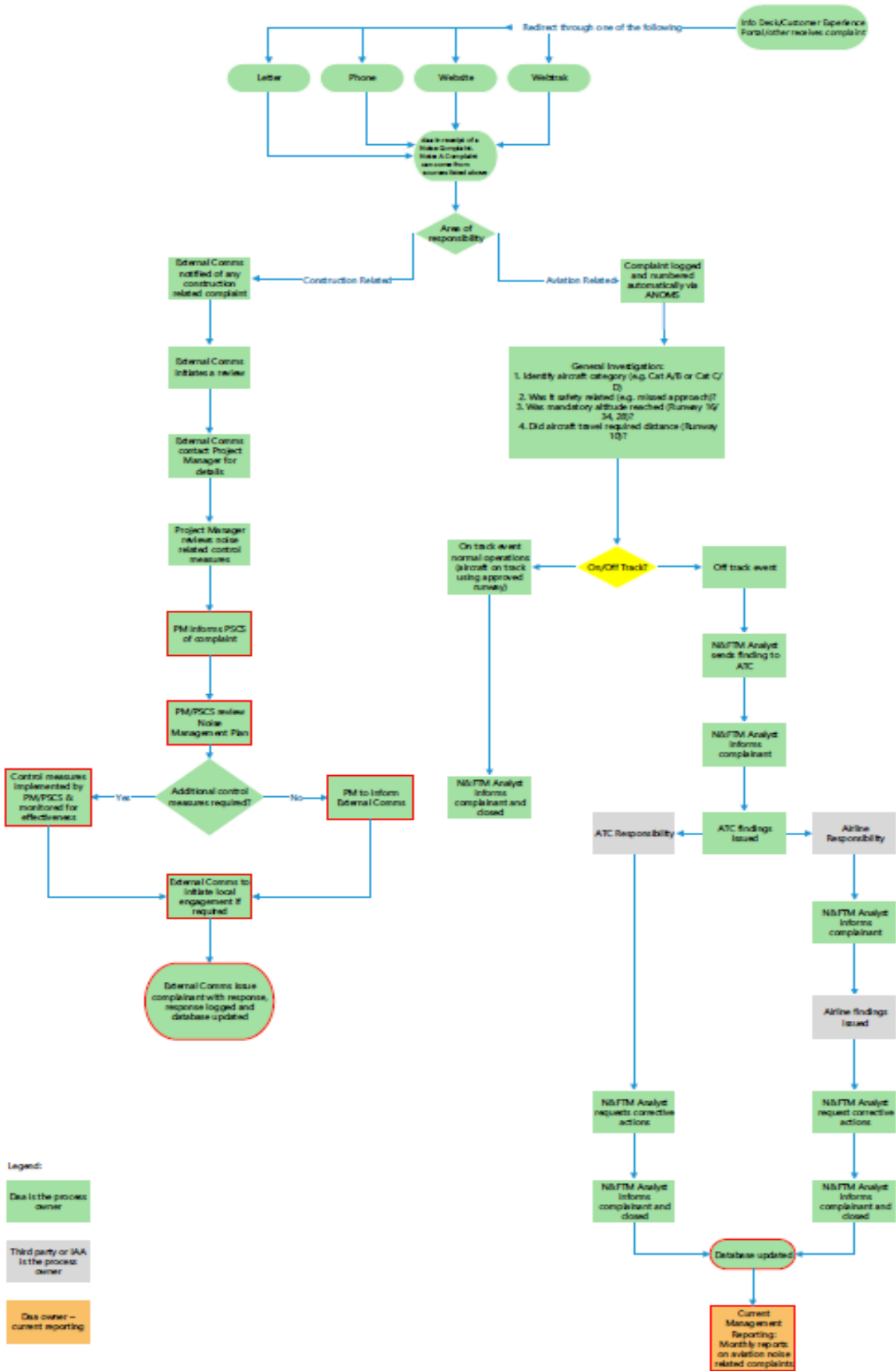
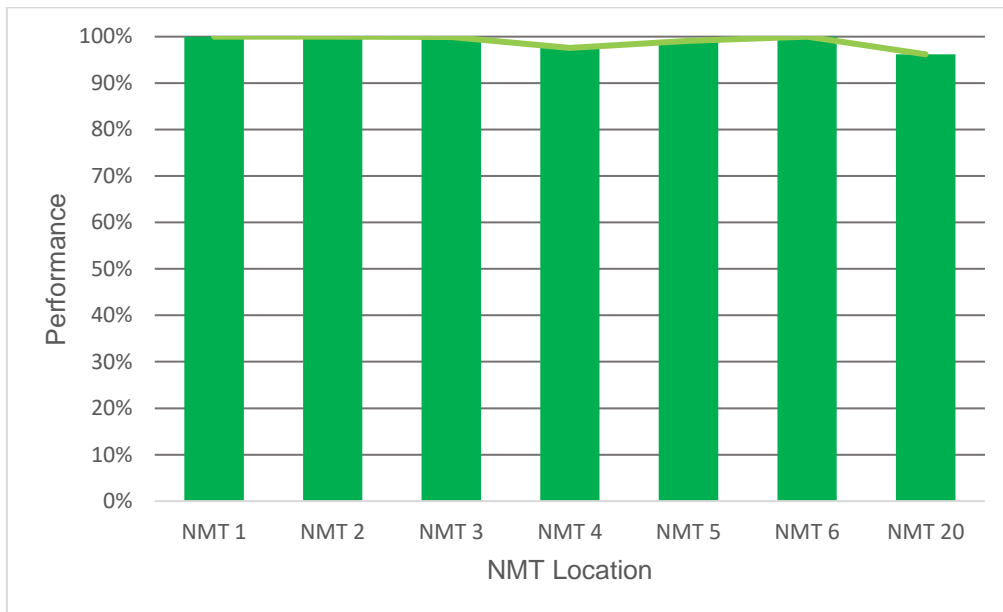


Fig. 14 – Noise Management Procedure Flowchart

Figure 15 provides an overview of the percentage of time the NMT’s were operational during 2020. To ensure that Noise Monitoring Terminals

*NMT operational status 2020*

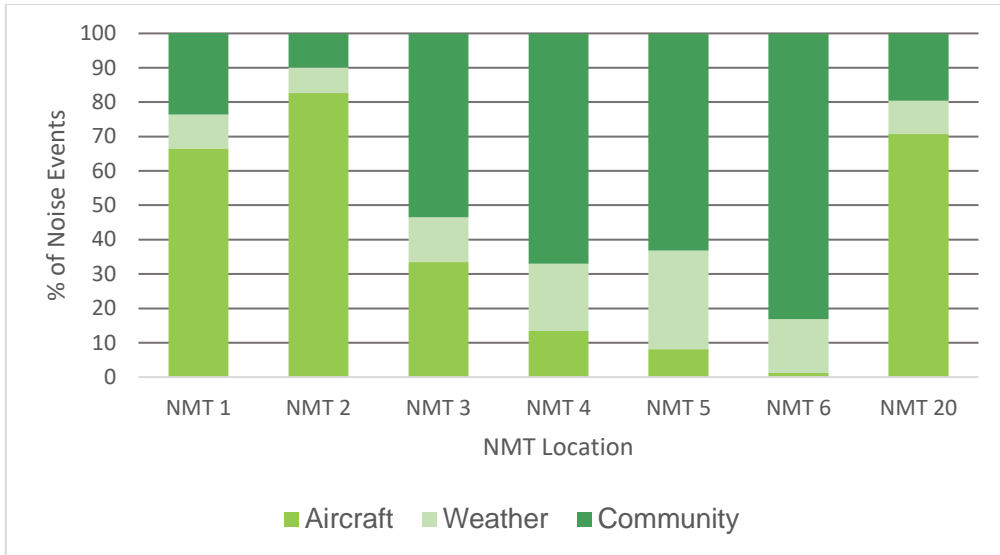
Figure 15 provides an overview of the percentage of time the NMT’s were operational during 2020. To ensure that Noise Monitoring Terminals keep working within specific limits, internal calibration checks are completed every 6 hours. During this short period, the NMT’s are out of operation for short periods of time and do not record noise events. The figure shows that all NMT’s were operational 99% of the time. Further detail on NMT operation is available in Appendix C.



**Fig. 15 – Uptime and Operational Status of NMT's, January - December 2020**

*Noise events*

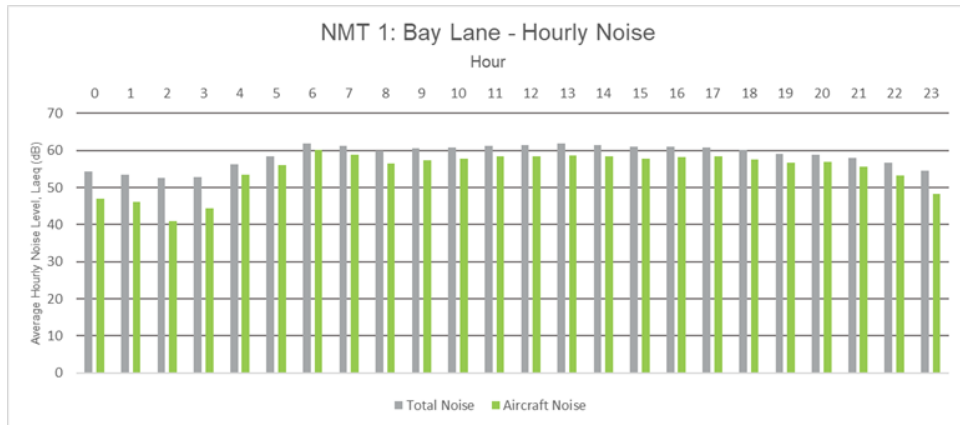
As mentioned, the system automatically classifies noise as aircraft noise, weather related noise or noise related to normal human activity. Due to their location relative to the airport and flightpaths, the NMT’s record less or more aircraft noise. NMT’s located directly under the flight paths of runway 10/28 (NMT 1, 2 and 20) mostly record aircraft noise events. NMT 6, located in North Dublin mostly records noise events related to normal human activity, due to its busy surroundings and the limited use of runway 16/34. Fig. 16 below details the noise events breakdown by type for 2020.



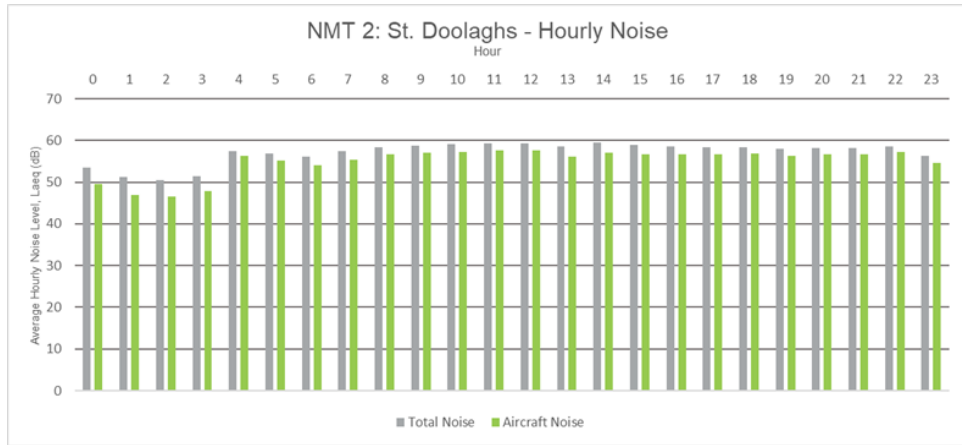
**Fig. 16 – Noise Events breakdown per NMT**

*Average hourly noise levels per NMT*

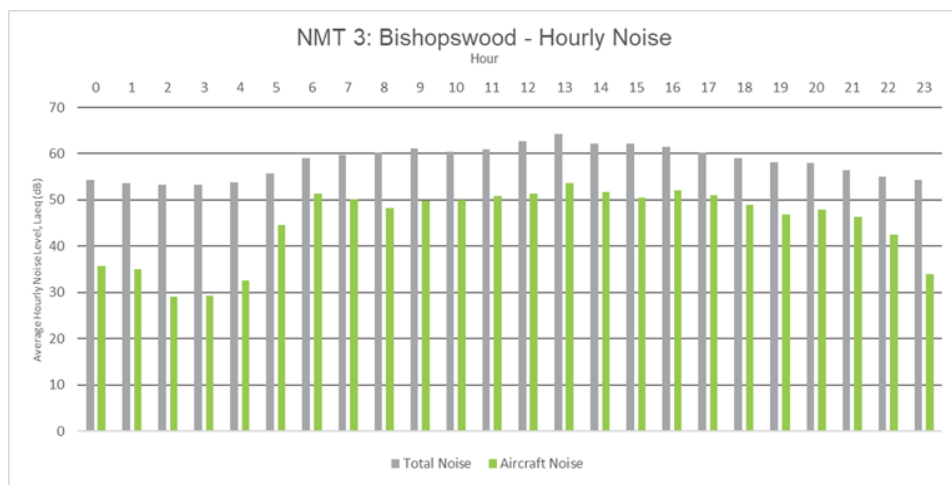
The figures in this section present the average noise levels measured by the NMT’s per hour of the day. Both noise levels of all noise events (total noise), and for those events that were correlated to aircraft movements are presented.



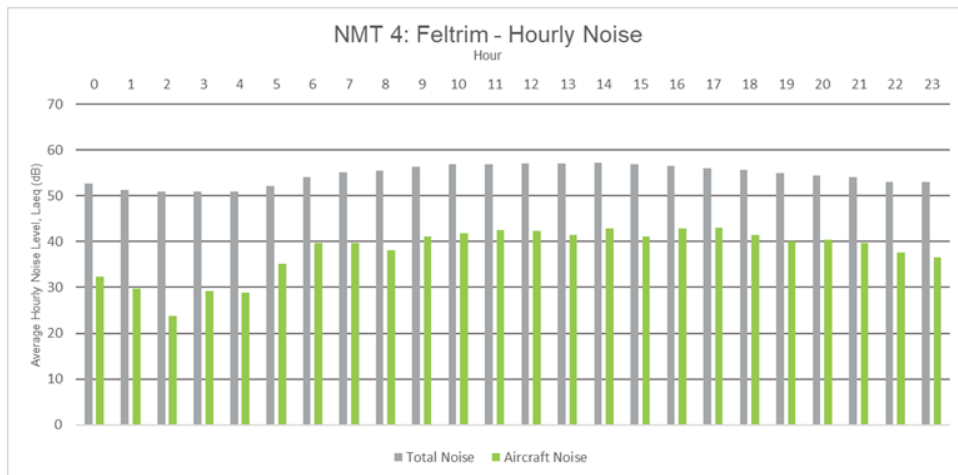
**Fig. 17 – NMT 1 hourly noise**



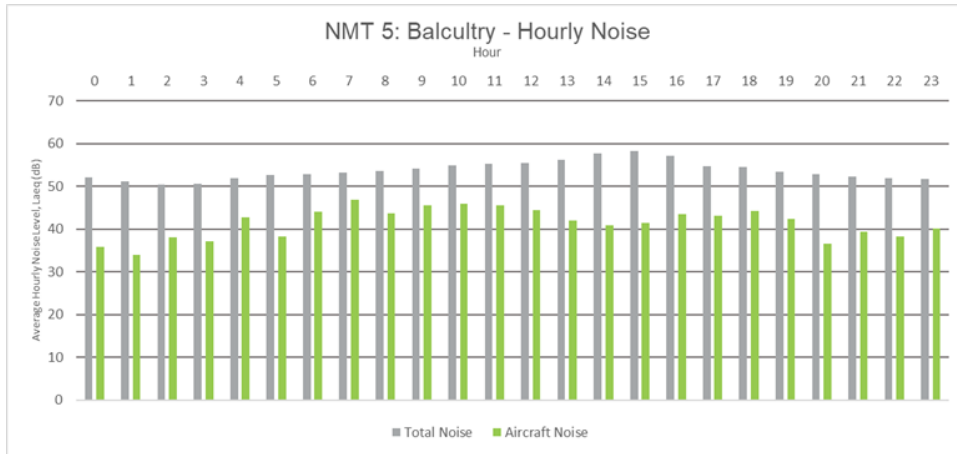
**Fig. 18 – NMT 2 hourly noise**



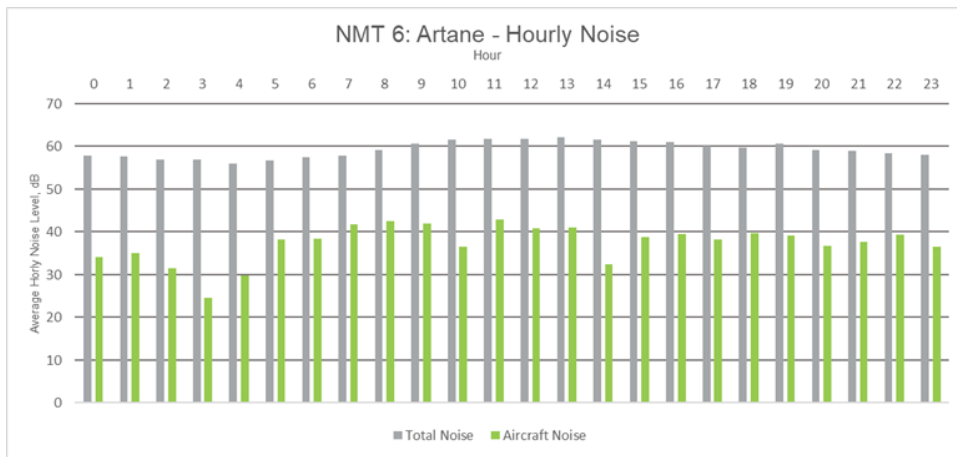
**Fig. 19 – NMT 3 hourly noise**



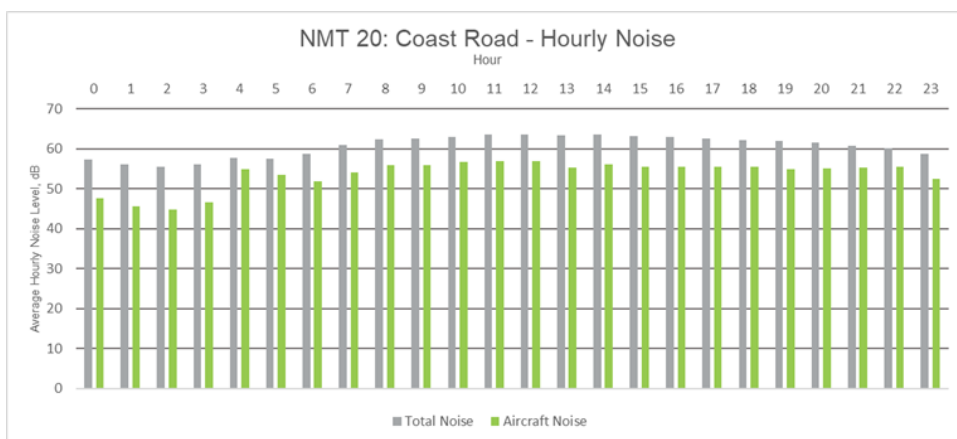
**Fig. 20 – NMT 4 hourly noise**



**Fig. 21 – NMT 5 hourly noise**



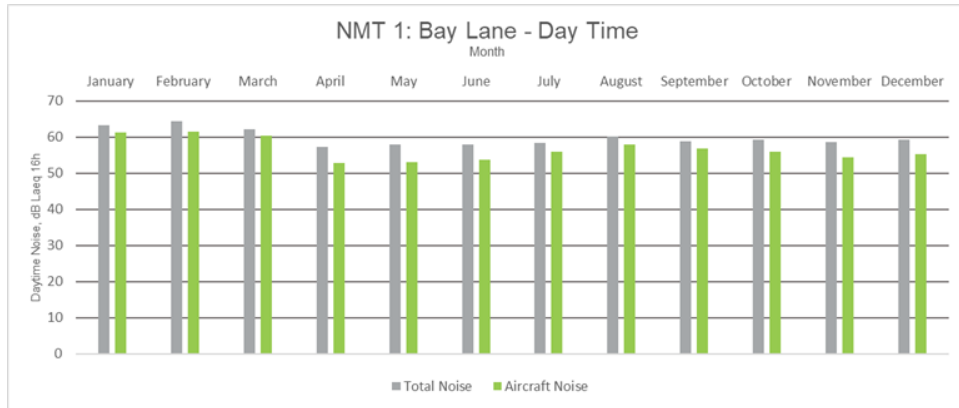
**Fig. 22 – NMT 6 hourly noise**



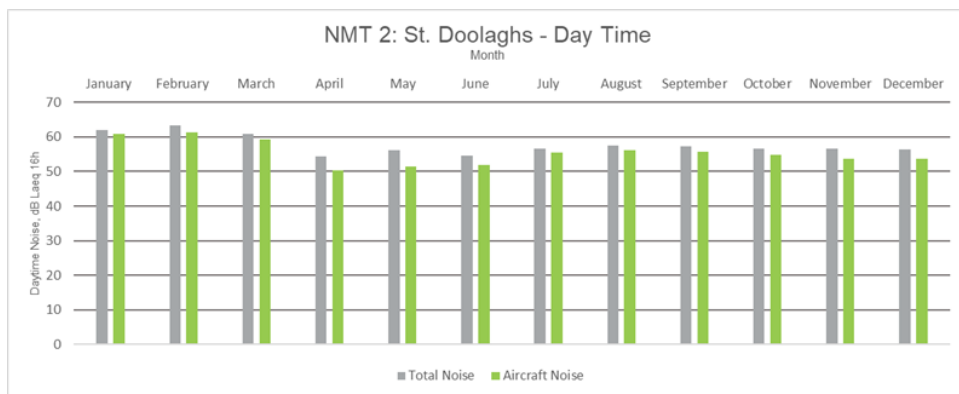
**Fig. 23 – NMT 20 hourly noise**

*Average noise levels per NMT (day)*

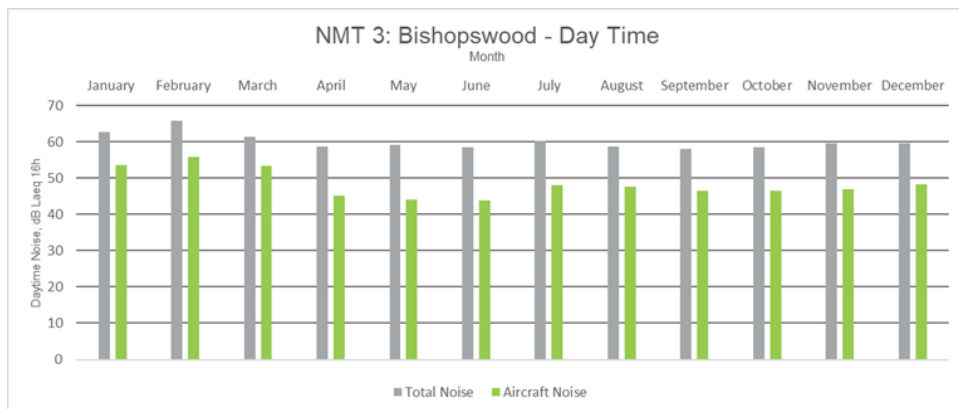
The figures in this section present the average noise levels measured by the NMT’s during daytime periods (07:00 – 23:00). Recorded noise levels during these time segments are averaged over the 16-hour period. This procedure is followed both for all noise events (total noise), and for those events that were correlated to aircraft movements. The results shown are presented per month.



**Fig. 24 – NMT 1 day time noise**



**Fig. 25 – NMT 2-day time noise**



**Fig. 26 – NMT 3-day time noise**



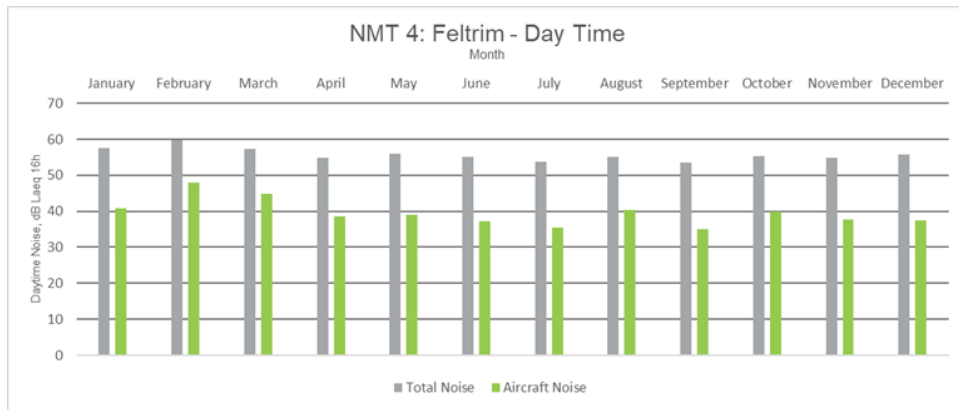


Fig. 27 – NMT 4-day time noise

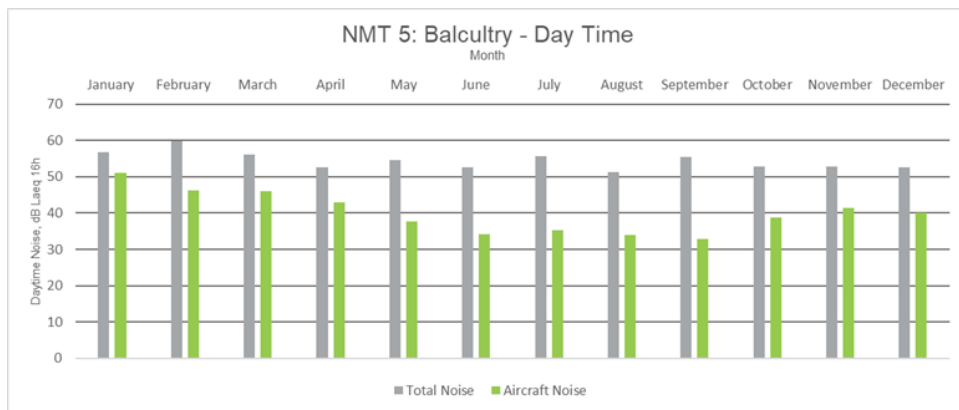


Fig. 28 – NMT 5-day time noise

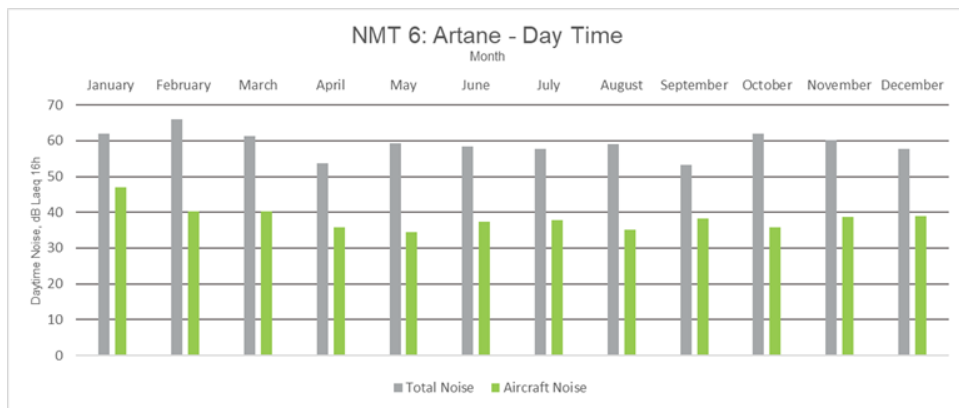
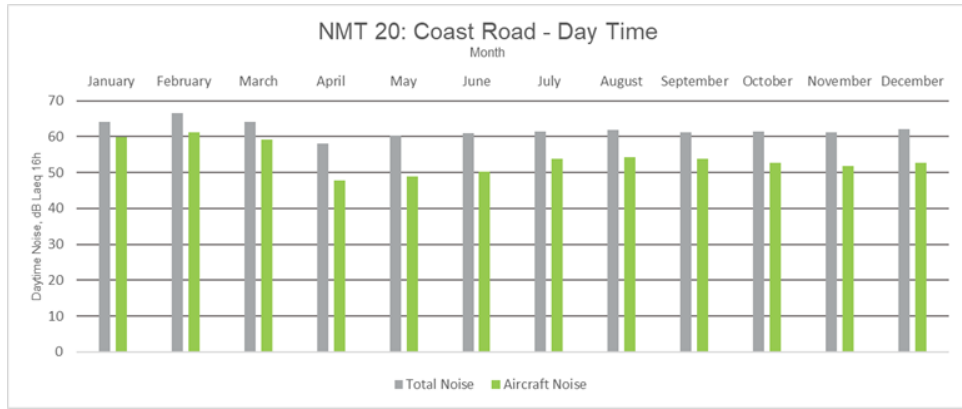


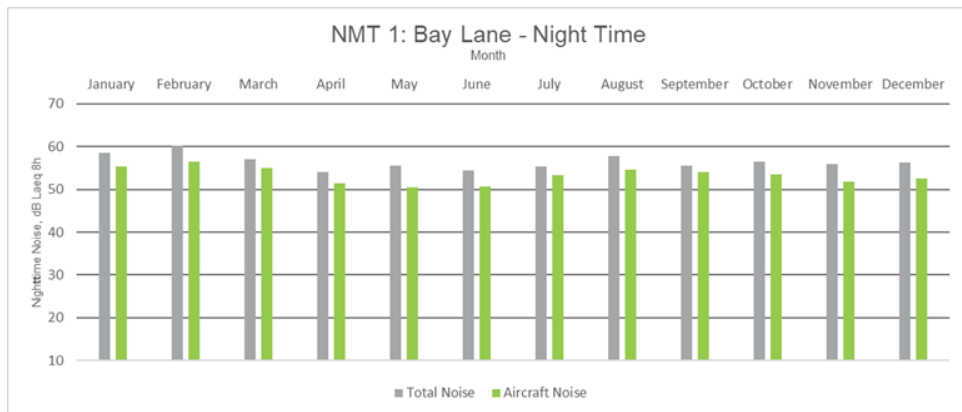
Fig. 29 – NMT 6-day time noise



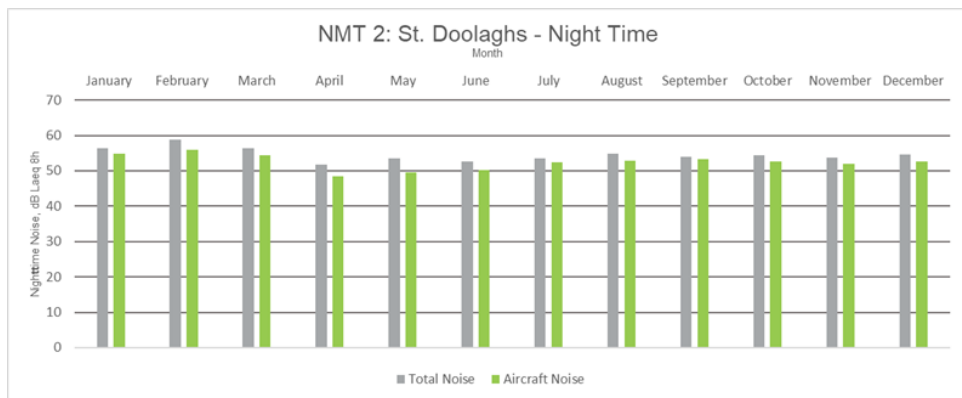
**Fig. 30 – NMT 20-day time noise**

*Average noise levels per NMT (night)*

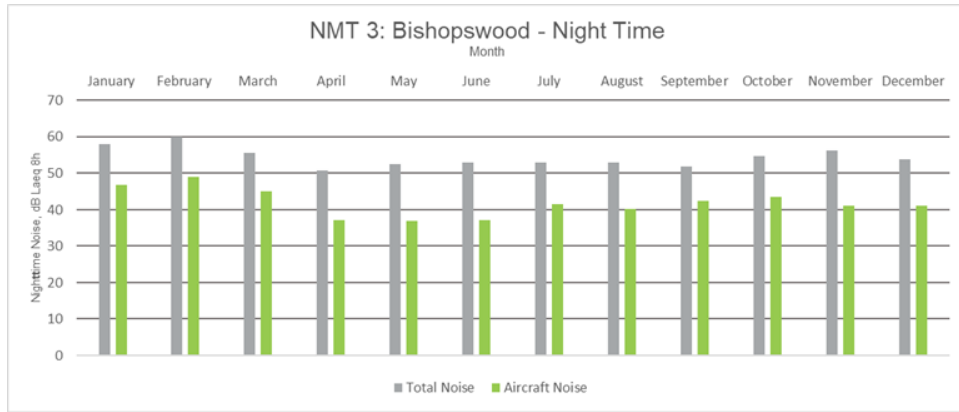
The figures in this section present the average noise levels measured by the NMT’s during night-time periods (23:00 – 07:00). Recorded noise levels during these time segments are averaged over the 8-hour period. This procedure is followed both for all noise events (total noise), and for those events that were correlated to aircraft movements. The results shown are presented per month.



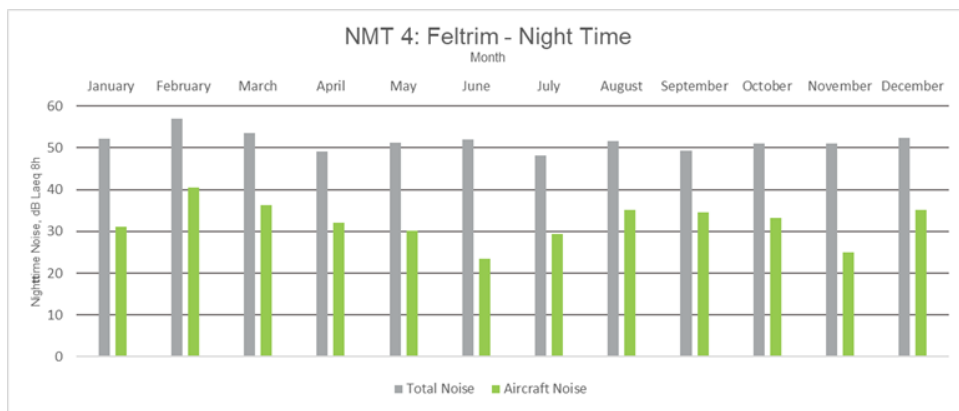
**Fig. 31 – NMT 1 night-time noise**



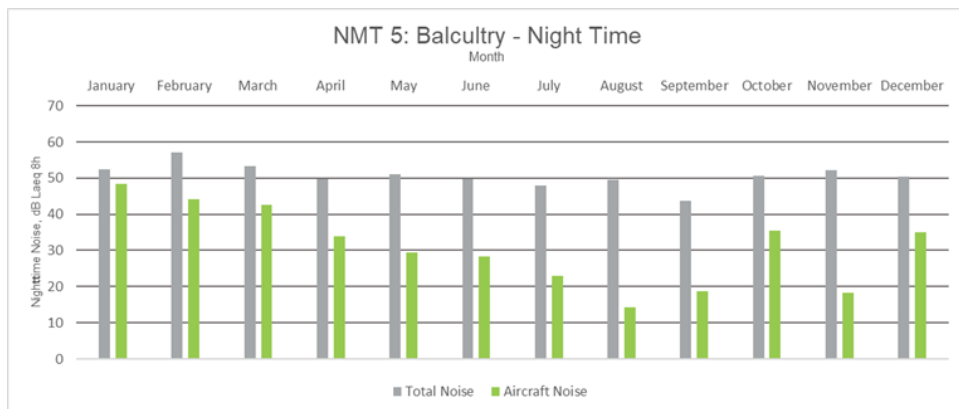
**Fig. 32 – NMT 2 night-time noise**



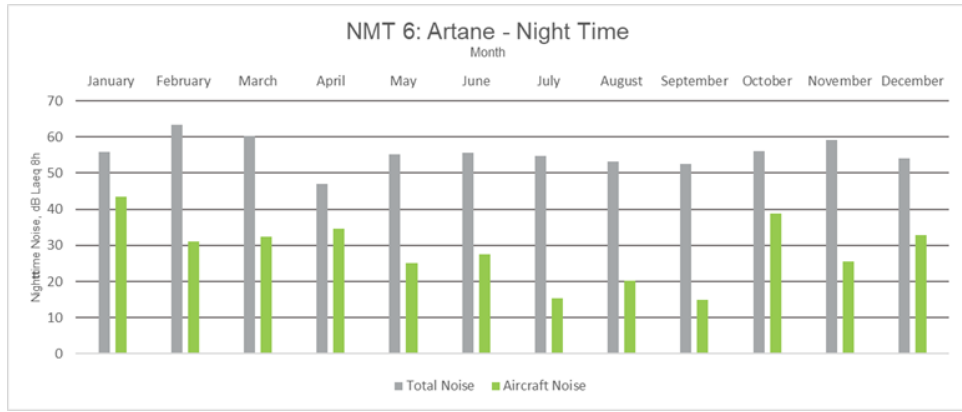
**Fig. 33 – NMT 3 night-time noise**



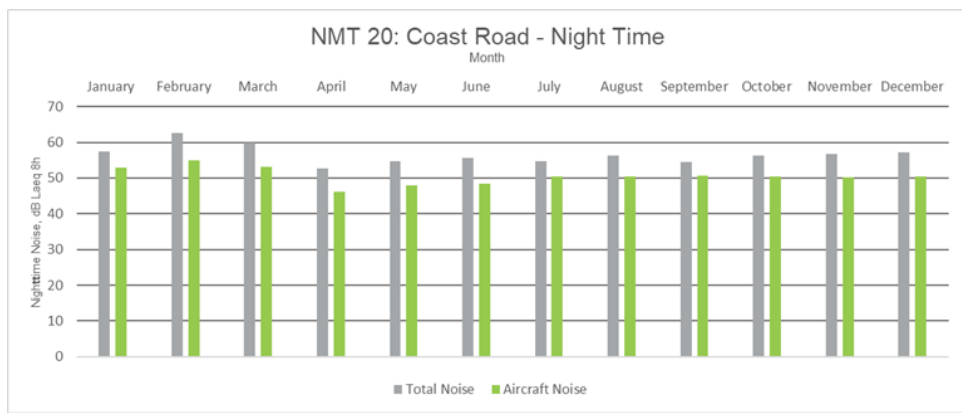
**Fig. 34 – NMT 4 night-time noise**



**Fig. 35 – NMT 5 night-time noise**



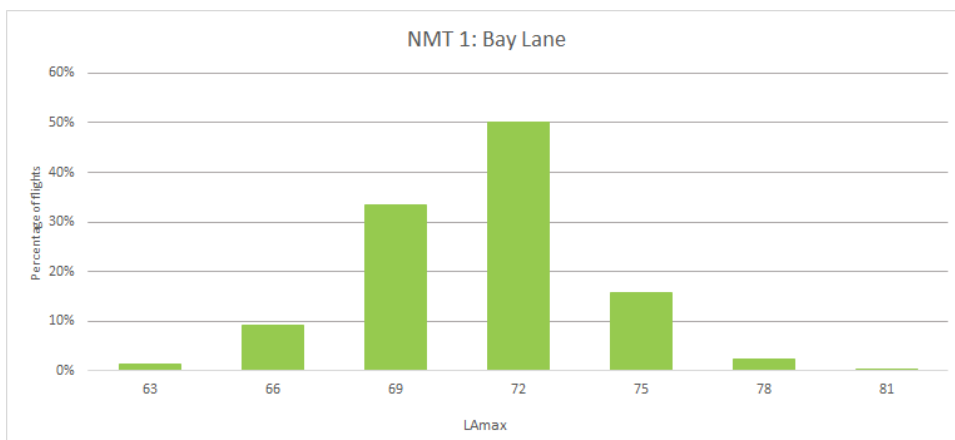
**Fig. 36 – NMT 6 night-time noise**



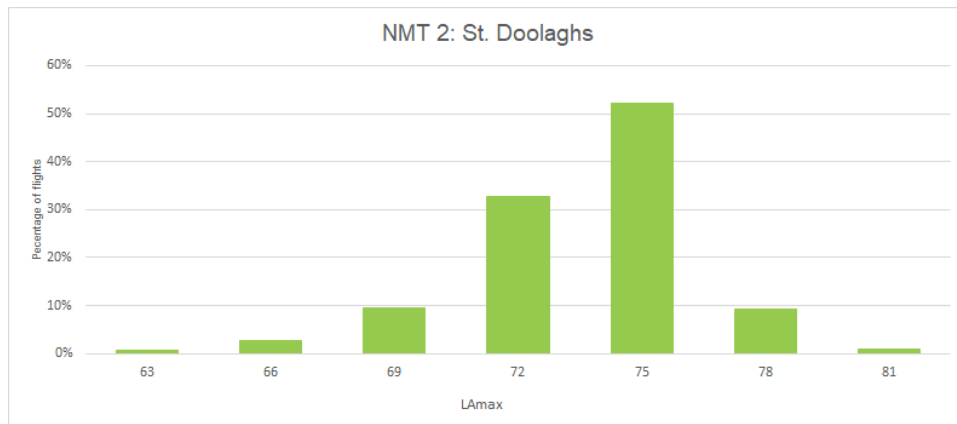
**Fig. 37 – NMT 20 night-time noise**

*LA<sub>max</sub> noise levels per NMT*

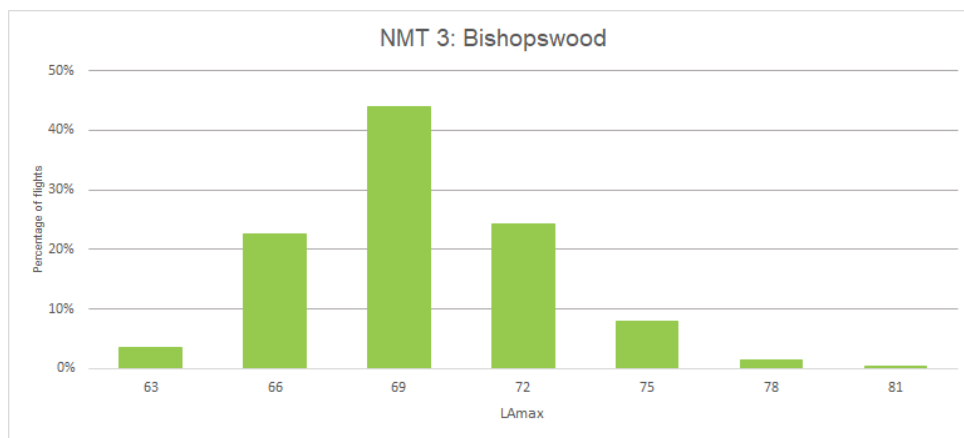
The figures in this section show the LA<sub>max</sub> distribution for aircraft noise per NMT. LA<sub>max</sub> indicates the maximum recorded noise level per correlated aircraft-noise event. The distribution is calculated by determining the number of occurrences per 3 dB bracket.



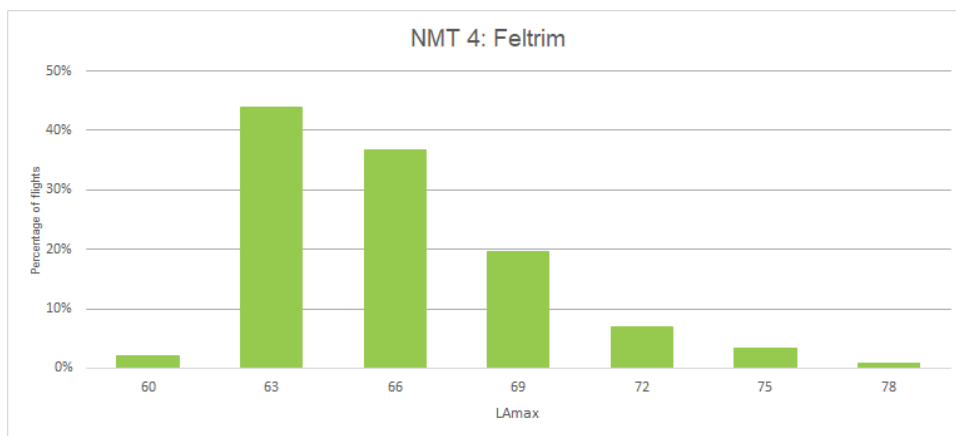
**Fig. 38– NMT 1 LA<sub>max</sub> noise**



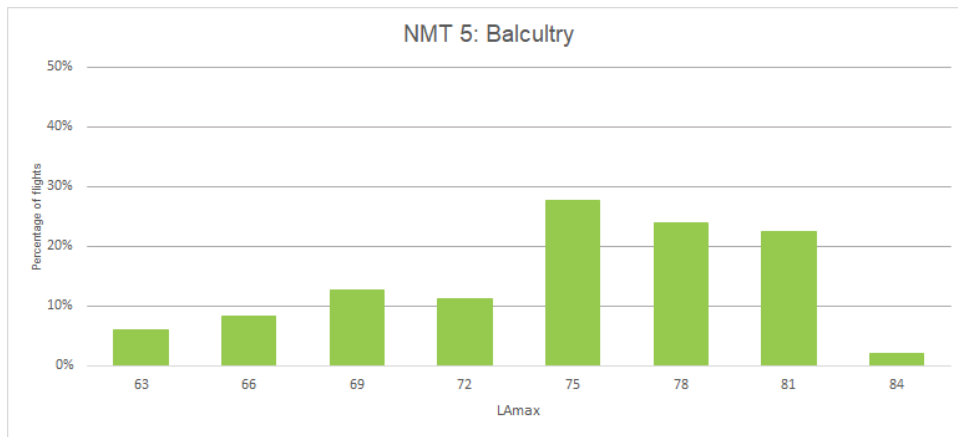
**Fig. 39– NMT 2 LA<sub>max</sub> noise**



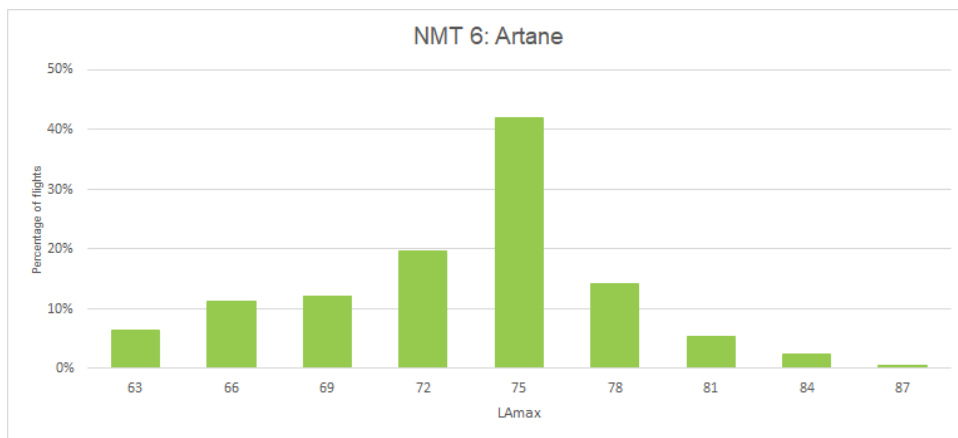
**Fig. 40– NMT 3 LA<sub>max</sub> noise**



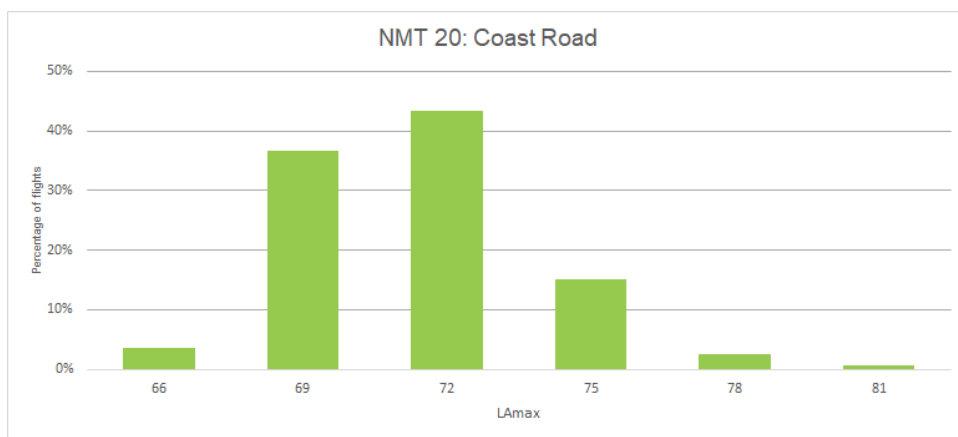
**Fig. 41– NMT 4 LA<sub>max</sub> noise**



**Fig. 42– NMT 5 LA<sub>max</sub> noise**



**Fig. 43– NMT 6 LA<sub>max</sub> noise**



**Fig. 44 – NMT 20 LA<sub>max</sub> noise**

## Traffic Distribution & Management

The noise impact around Dublin airport is affected by several factors, these include number of movements, types of aircraft used, runway usage and route usage. The sections below set out the statistics and detail for 2020.

### Traffic numbers

In 2020, Dublin Airport facilitated 87192 aircraft movements (landing or take-off).

Table 3 provides an overview of the number of movements per month. The airport is licensed to operate 365 days a year, 24 hours per day. In the winter season (Nov-Mar) Dublin Airport facilitates between 1,600 and 16,750 movements per month. In the summer period Dublin Airport facilitated between 2,050 and 8250 movements per month.

		Runway 10r	RWY 10 %	Runway 16	RWY 16 %	Runway 28l	RWY 28 %	Runway 34	RWY 34 %	Runway HH	Heli	Total
<b>Total</b>	<b>Total</b>	<b>8975</b>	<b>10.3</b>	<b>1324</b>	<b>1.5</b>	<b>75647</b>	<b>86.8</b>	<b>436</b>	<b>0.5</b>	<b>810</b>	<b>0.9</b>	<b>87192</b>
2020	January	41	0.2	656	3.9	15725	94.4	158	0.9	72	0.4	16652
2020	February	939	6.0	466	3.0	14079	90.3	62	0.4	38	0.2	15584
2020	March	1566	12.2	79	0.6	11000	85.7	139	1.1	58	0.5	12842
2020	April	777	37.8	36	1.8	1184	57.7	0	0.0	56	2.7	2053
2020	May	820	35.9	0	0.0	1411	61.7	0	0.0	55	2.4	2286
2020	June	578	22.3	0	0.0	1945	75.0	1	0.0	70	2.7	2594
2020	July	85	1.3	1	0.0	6345	97.4	2	0.0	80	1.2	6513
2020	August	1625	19.8	1	0.0	6476	78.9	3	0.0	104	1.3	8209
2020	September	899	12.8	0	0.0	6056	86.1	1	0.0	80	1.1	7036
2020	October	854	15.2	27	0.5	4624	82.4	31	0.6	77	1.4	5613
2020	November	396	10.6	17	0.5	3258	87.0	10	0.3	63	1.7	3744
2020	December	395	9.7	41	1.0	3544	87.2	29	0.7	57	1.4	4066

**Table 3 – RWY Usage metrics**

### Runway layout and usage

Dublin Airport currently operates two runways: a main east-west runway 10/28 with a length of 2,637m, and a cross northwest-southeast runway 16/34 with a length of 2,072m.

Runway 10/28 is operated as the primary runway. 86.75% of all movements used this runway in westerly operation and 10.29% in easterly operation. Runway 10/28 is the required runway between 06:00 and 23:00 when the crosswind component is 20 kts or less. Runway 28 is the preferential runway when the tailwind component is 10 kts or less and braking action is assessed as good. Aircraft are required to use these runways except when operational reasons dictate otherwise. Between 23:00 and 06:00, runways are prioritised subject to the same wind calculation method and values as used between 06:00 and 23:00. Runway usage is also prioritised for noise abatement purposes during these hours when operation and weather conditions allow.

Runway 16/34 was used for only 2.02% of the movements in 2020 (1,760 movements). Runway 16/34 is only used when the crosswind component on runway 10/28 exceeds 20 knots and is expected to persist for a prolonged period. It is also used during dual operations for peak departures between 06:30 and 08:00 or when maintenance is conducted on runway 10/28. High usage of the primary runway is preferential in terms of noise impact, since the areas underneath its flightpaths are less

populated than runway 16/34, whose flightpaths to the south are located over Dublin. Most departure operations overfly North Dublin when Runway 16 is operational. Runway 34 is rarely used for arrivals.

### Runway 16/34 usage

As detailed above there are instances, aside from safety and crosswind component, that determine the operational use of RWY 16/34. Generally these operational decisions are maintenance driven with particular reasoning and instances through 2020 including:

- Rubber Removal

Each aircraft landing leaves rubber residue from the aircraft's tyres which in turn starts to progressively build up on the surface of the runway. This accumulation of rubber on the runway can compromise the gripping or friction levels required for aircraft to land safely. To ensure our runway is safe, we engage specialist contractors to remove this rubber residue using ultra high-pressure washing equipment. This work is carefully planned and was carried out at nighttime between 23:00 – 04:30 on four occasions in 2020 so as not to impact the day-to-day flight operations.

- Grass Cutting

Birds can be a major hazard at all international airports, and it is a challenge to keep them away from the airfield. Dublin Airport has over 670 acres of grasslands which needs to be managed carefully to stop birds nesting and foraging for food on the airfield.

Grass cutting involves a trained team using a combination of tractors and mowers, ride-on mowers, and grass trimmer's to maintain the grass areas.

The teams work their way progressively around the around the airfield cutting the grass around all lights and signs, taking care not to impact on the day-to-day operations as they complete their work. Dublin Airport has a long grass policy which deters birds from landing on the airfield, this means that the grass is never cut too short.

For areas that cannot be cut during the daytime hours, the team completes cutting activities at nighttime in co-ordination with airport operations. These works took place on four occasions in 2020 between 23:30 – 04:30 for a period of a week. During these times, the northerly approach to the secondary runway R16 was used.

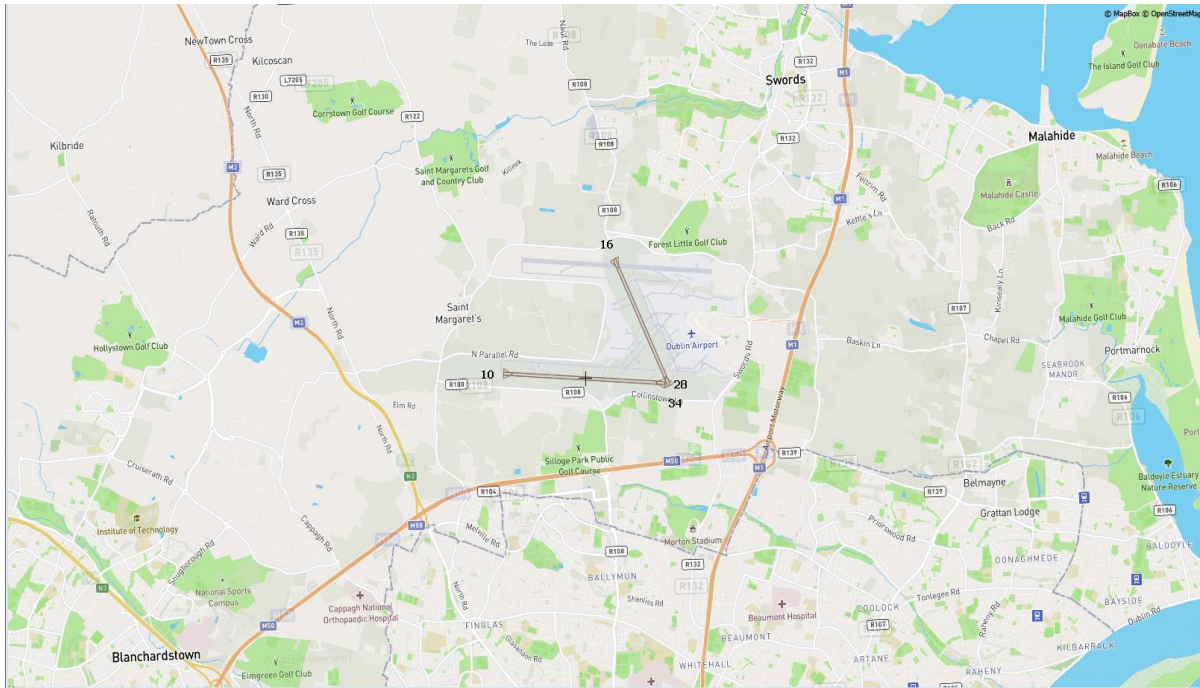
- Quarterly Visual Inspection

Dublin Airport completed quarterly hourly inspections on RWY 10/28 during daytime hours typically between 14:00 – 15:00 when there is minimal or widebody movements. This necessitated the use of RWY 16/34.

- Redesignation of Paint Markings

In preparation for the operational readiness phase and opening of the Norther Runway redesignation markings on RWY 10/28 were changed to 10R/28L between the hours of 23:00 and 04:30. The works required the usage of RWY 16/34 for a period of 2 weeks.





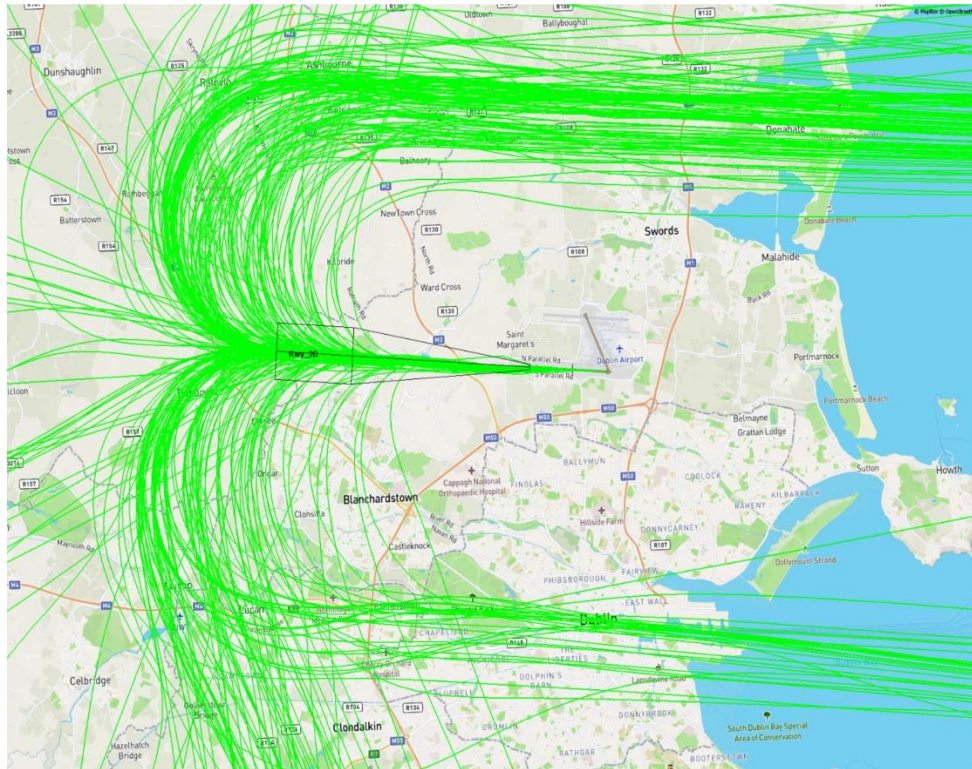
**Fig. 45– RWY layout**

Runway designation	Arrivals only	Departures only	Total
<b>28</b>	37889	37686	75575
<b>10</b>	4498	4455	8953
<b>34</b>	352	83	435
<b>16</b>	636	686	1322

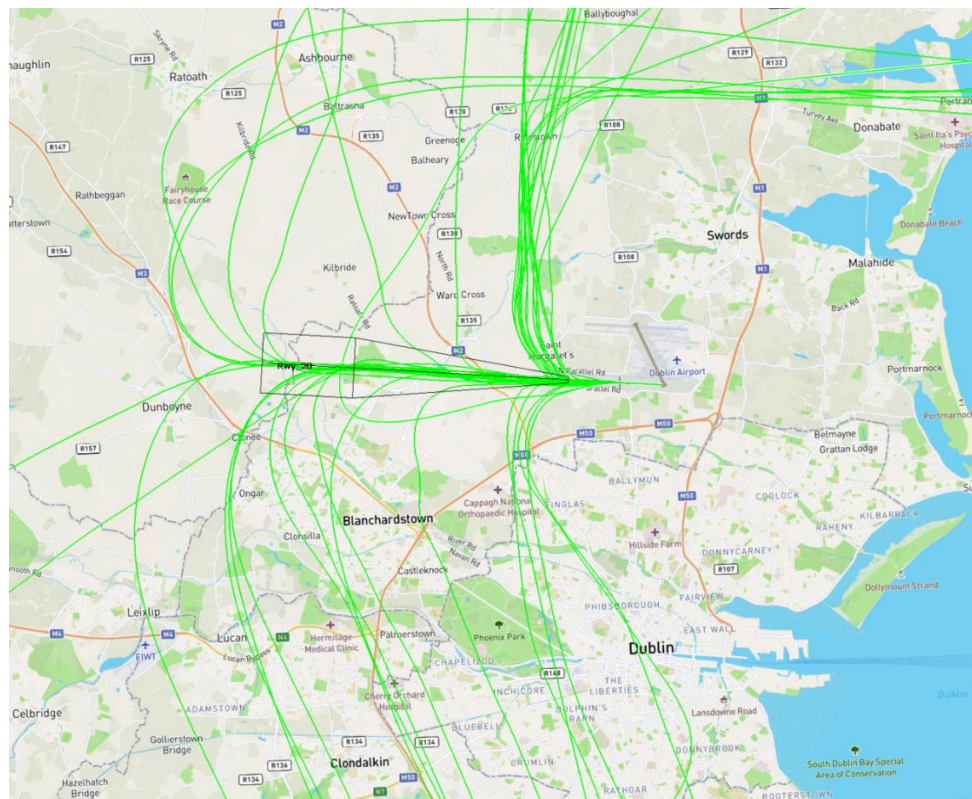
**Table 4 – RWY usage statistics**

**Busiest day flight tracks**

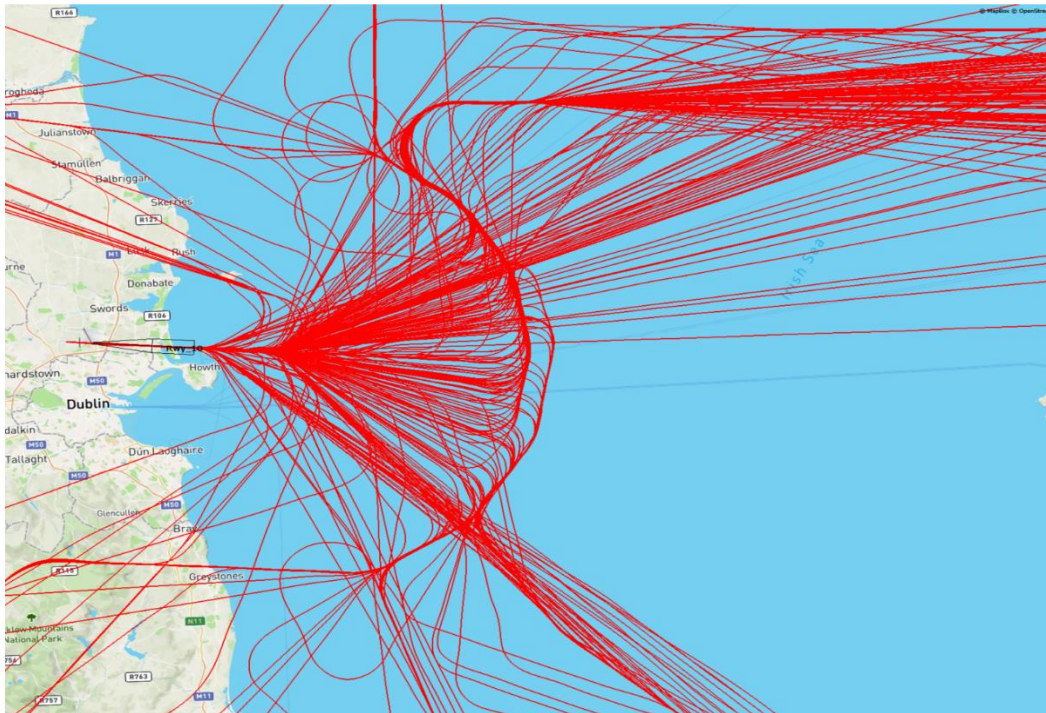
2020 was the year that Covid impacted aviation worldwide. In the northern hemisphere, the summer months are typically the busiest but at Dublin airport the busiest day in 2020 was 3<sup>rd</sup> January. The images below are screenshots of tracks from the ANOMS NFTMS system. The images show arrival and departure tracks for the day, split into Category A/B and C/D aircraft groups.



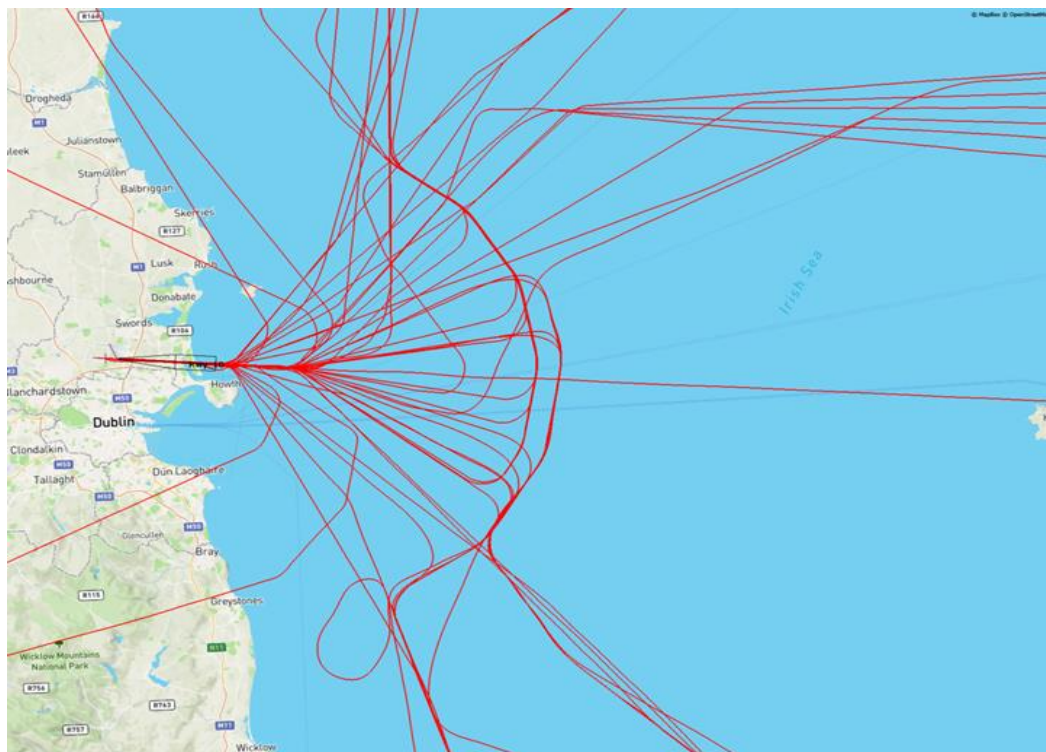
**Fig. 46: Tracks of category C/D departures on 3rd January 2020**



**Fig. 47: Tracks of category A/B departures on 3rd January 2020**



**Fig. 48: Tracks of category C/D arrivals on 3rd January 2020**



**Fig. 49: Tracks of category A/B arrivals on 3rd January 2020**

## Engine Ground Running data

Engine ground running is facilitated in section 5 of the AIP and sets out the requirements for both high power and idle speed runs for at 5 no. designated test site locations, aircraft stands and the facilitation of larger aircraft.

The logging of engine ground running is completed by the daa Airside Management Unit and is compiled in an operations log. For 2020 engine ground running was facilitated at Engine Test site 1 and RWY 16/34 for high power while idle speed runs were completed on stand as required. Operational logging of idle speed test runs is not ordinarily undertaken by the daa Airside Management Unit and as such Table 5 below details the 2019-2020 comparison without idle speed. The duration of the tests performed in 2020 are further noted in Table 6. Incomplete operational data for 7 no. of the test accounts for the discrepancy in totals between the tables.

Location	2019	2020
Test Site 1 (high power)	350	184
Rwy 16/34 (aircraft larger than code C/B757)	7	7
Total	357	191

**Table 5: 2019/2020 comparison total engine test runs**

Duration of Engine Tests (mins)	No.
>0 - <=5	1
> 5 - <=10	1
10-15	3
15-20	9
20-25	13
25-30	22
30-35	23
35-40	24
40-45	15
45-50	10
50-55	7
55-60	11
60-65	7
65-70	8
70-75	2
75-80	6
80-85	2
85-90	3
90-95	2
95-100	1
100-105	2
105-110	2
110-115	0
115-120	2
120-125	3
125-130	1
130-135	0
135-140	0
140-145	0
145-150	0
150-155	0
155-160	0
160-165	0
165-170	0
170-175	1
175-180	2
180-185	0
185-190	0
190-195	0
195-200	0
200-205	1

**Table 6: 2019/2020 engine test duration**

## Engagement forums

daa is a neighbour to many communities on whom we depend to operate Dublin Airport on a daily basis. We are fully committed to being a responsible airport operator and a good neighbour. daa understand that a balance needs to be achieved in terms of operating an international airport and the needs of our local communities. That is why we have a long record of engaging with our neighbours about the issues that are of importance to them, particularly those relating to aviation noise.

daa has established multiple engagement channels and forums which have been and continue to be very successfully employed to communicate and engage with our neighbours in the most meaningful and effective manner.

### Community Liaison Group (CLG)

The independently chaired CLG was set up in 2016 and comprises representatives from daa, Fingal County Council, and residents in the St. Margaret's area. The group meets bimonthly to discuss matters of interest to the local community including current and future for the area, airport operations and environmental issues.

When required or requested, experts attend the meetings to provide an opportunity for detailed discussion on a topic that is deemed to be of particular importance to the group (e.g. demonstration of WebTrak before official launch, advance briefing about North Runway Relevant Action Application, BAP presentation to explain noise contours, etc.).

This is a hugely beneficial forum to facilitate information exchange with the community and to address issues raised, where possible. The forum also provides a solid platform for all three bodies to communicate in an open and transparent manner. Meetings largely place online due to Covid, but face-to-face meetings will resume when easement of restrictions and participant consensus permit.

The CLG was provided with a special briefing regarding the North Runway Relevant Action Application on 15th December 2020. This briefing was conducted as an information sharing session to provide an overview of the proposed Relevant Action and to highlight where concerns raised at 2016 engagement sessions had been addressed and incorporated into the proposed Relevant Action. The advanced briefing was also used to provide information in relation to the statutory planning process, such as the dates for public submissions to be sent to the Planning Authority and to raise awareness to attendees of the opportunity to submit into the process.

### Dublin Airport Environmental Working Group (DAEWG)

The independently chaired DAEWG was established in 2004 (then known as the Dublin Airport Stakeholder Forum). The group comprises members from daa, Fingal County Council, the Irish Aviation Authority, and several representatives from local communities and resident associations. The group meets on a quarterly basis to discuss environmental issues and is provided with updates on noise, air quality, water quality and current/planned projects. When required or requested, experts attend the meetings to provide an opportunity for detailed discussion on a topic that is deemed to be of particular importance to the group (e.g. demonstration of WebTrak before official launch, advance briefing about North Runway Relevant Action Application, BAP presentation to explain noise contours, etc.). Meetings largely place online due to Covid, but face-to-face meetings will resume when easement of restrictions permit.

The DAEWG was provided with a special briefing regarding the North Runway Relevant Action Application on 16th December 2020. This briefing was conducted as an information sharing session

to provide an overview of the proposed Relevant Action and to highlight where concerns raised at 2016 engagement sessions had been addressed and incorporated into the proposed Relevant Action. The advanced briefing was also used to provide information in relation to the statutory planning process, such as the dates for public submissions to be sent to the Planning Authority and to raise awareness to attendees of the opportunity to submit into the process.

### Drop-in Clinics

Drop-in clinics were held on a bi-monthly in local areas (St. Margaret's, Swords, Santry, Kinsealy/Feltrim, Portmarnock and Malahide), utilising local community centres where possible. The purpose of the clinics is to provide an opportunity for local residents to raise any queries regarding current operations and planned projects at Dublin Airport. The drop-in clinics have been very well received and afford an opportunity to engage face-to-face with local residents and to listen to and address their concerns. Clinics have been suspended in compliance with Government guidelines, but will resume when easing of restrictions permit.

### Other Engagement Channels

Whilst we would normally hold face-to-face meetings with individual residents and groups on issues of particular concern, this was not fully possible because of Covid restrictions. To combat this and to enhance our engagement on milestone projects and issues, for example, a Virtual Reality Portal was created which provides virtual materials and information as would appear at a public event to explain the North Runway Relevant Action in non-technical terms and to provide access to high-resolution interactive noise mapping amongst other relevant information.

In addition, virtual meetings with individual residents, where necessary and in compliance with safety guidelines were conducted, home visits to local residents who were unable to engage virtually; maintenance of fully-manned freephone and email channels; continual update of websites to provide accurate, current information; regular updates to over 1,000 subscribers to the update service; issue relevant information via press releases and social media; local Elected Representatives apprised of ongoing issues.

## Operating Restrictions/Flight Procedure changes

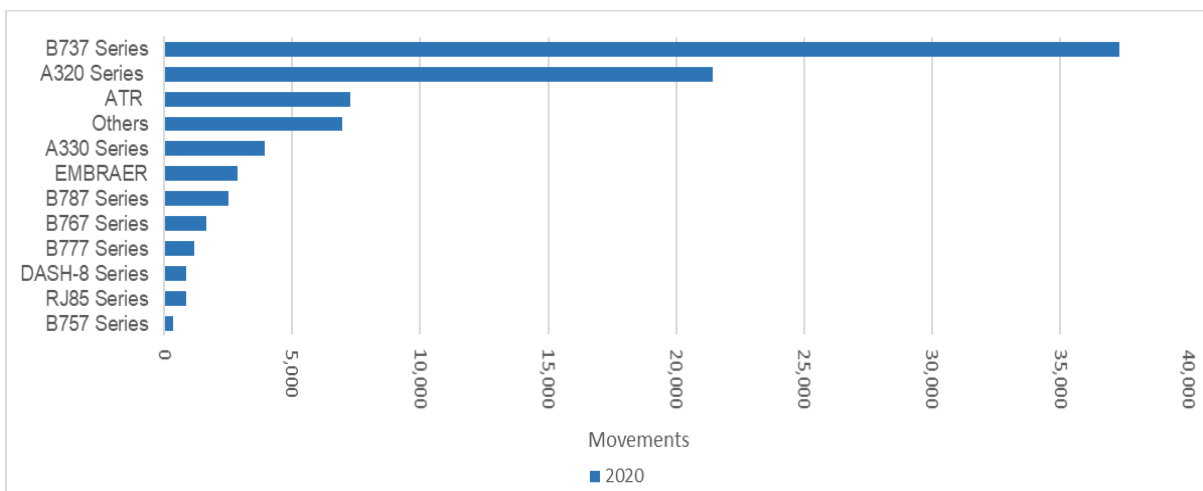
Currently there are no effective operating restrictions formally in place at Dublin Airport. There are three noise related operating restrictions associated with the operations of the North Runway planning permission. These are Condition 3d, 4 and 5. The North Runway is currently under construction and therefore these operating restrictions are as yet not in force.

A review of flight procedure and instrument approach procedure changes made in 2020 has been completed in partnership with the ANSP. The relevant table of changes is listed in Appendix A – IFP Listings for 2020. All changes made in 2020 were standard updates having no impact on flight procedures pertaining to operating restrictions or noise abatement procedures.

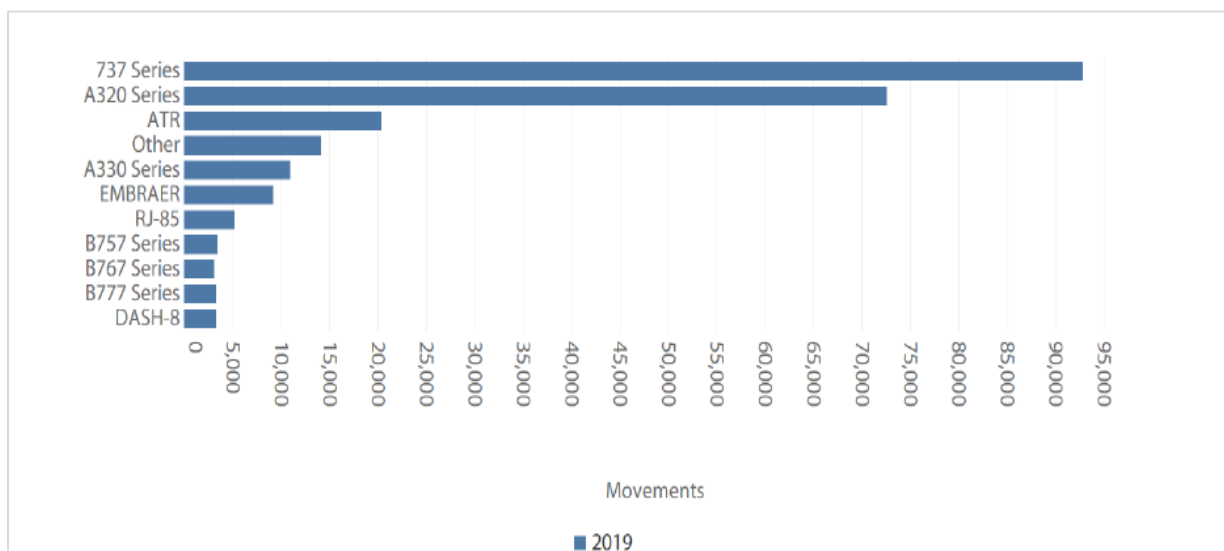


## Fleet Mix / Chapter Assessment

The distribution of aircraft type groups based on movements for both 2019 and 2020 is shown below. Only aircraft types with more than 200 movements are shown to improve readability. As can be seen, in both years the B737-800 (B738) and A320 aircraft types were used the most. Most of the aircraft configurations (engine types and take-off weights) of these two types are compliant with chapter 4 limits.



**Fig. 50: Aircraft type and fleet mix, 2020**



**Fig. 51: Aircraft type and fleet mix, 2019**

The schedule of operations for 2020 listing the individual movements by aircraft type and registration has been reviewed. This schedule included noise certification data and both registration maximum take-off weight (MTOW) and Manufacturer/Aircraft maximum take-off weight MTOW as provided by the airport users in the latest Fleet Declaration Forms. Specialist. Further details on ICAO Chapter compliance are provided in Appendix B.

The review of the types undertaking the majority of operations at Dublin Airport is set out below in Table 7 and referenced against 2019.

Item	2019 (%)	2020 (%)
ICAO Noise Chapter Assessment using Manufacturer MTOW	56% Chapter 4	57.4% Chapter 4
	41% Chapter 14	37.3% Chapter 14
	97% > Chapter 4	94.7% > Chapter 4
ICAO Noise Chapter Assessment using Certified MTOW	73.8% Chapter 4	71.7% Chapter 4
	21.8% Chapter 14	22.6% Chapter 14
	95.6% > Chapter 4	94.3% >Chapter 4

**Table 7 – Chapter Assessment of aircraft types at Dublin Airport**

## Noise Contours

Bickerdike Allen Partners (BAP) have been retained by daa to produce the noise contours for 2020. The contours produced for Dublin Airport are based on the annual movements using the  $L_{den}$  and  $L_{night}$  metric. Noise contours have also been produced based on the movements in the 92-day summer period (16th June to 15th September) for two metrics, the  $L_{Aeq,16h}$  average daytime metric and  $L_{Aeq,8h}$  average night-time metric. The report is available in full in Appendix E and sets out detailed methodology, validation, and assumptions.

The individual 2020 noise contours, and comparison of the 2019 and 2020 noise contours is represented in the figures below. Actual aircraft movements in 2020 and noise levels from the Dublin Airport NMT's have been used to create the noise contours using a similar methodology to that used to produce the 2019 contours.

The areas of the 2020 annual  $L_{den}$ ,  $L_{night}$ ,  $L_{Aeq,16h}$ , and  $L_{Aeq,8h}$  contours are shown below in the Tables below, where they are compared with the 2019 contour areas.

Metric Value, dB $L_{den}$	Contour Area, km <sup>2</sup>	
	2020	2019
≥ 45	237.2	745.7
≥ 50	90.3	218.7
≥ 55	36.5	88.3
≥ 60	12.5	35.6
≥ 65	4.4	12.2
≥ 70	1.6	4.4
≥ 75	0.7	1.7

**Table 8 – Contour Areas,  $L_{den}$  Metric**

Metric Value, dB $L_{night}$	Contour Area, km <sup>2</sup>	
	2020	2019
≥ 40	138.7	328.4
≥ 45	59.8	122.2
≥ 50	21.7	52.3
≥ 55	7.5	18.6
≥ 60	2.7	6.4
≥ 65	1.0	2.5
≥ 70	0.4	1.0

**Table 9 – Contour Areas,  $L_{night}$  Metric**

Metric Value, dB L <sub>Aeq,16h</sub>	Contour Area, km <sup>2</sup>	
	2020	2019
≥ 51	34.2	114.3
≥ 54	18.0	69.9
≥ 57	9.6	39.8
≥ 60	5.1	21.3
≥ 63	2.8	11.4
≥ 66	1.5	6.1
≥ 69	0.9	3.3

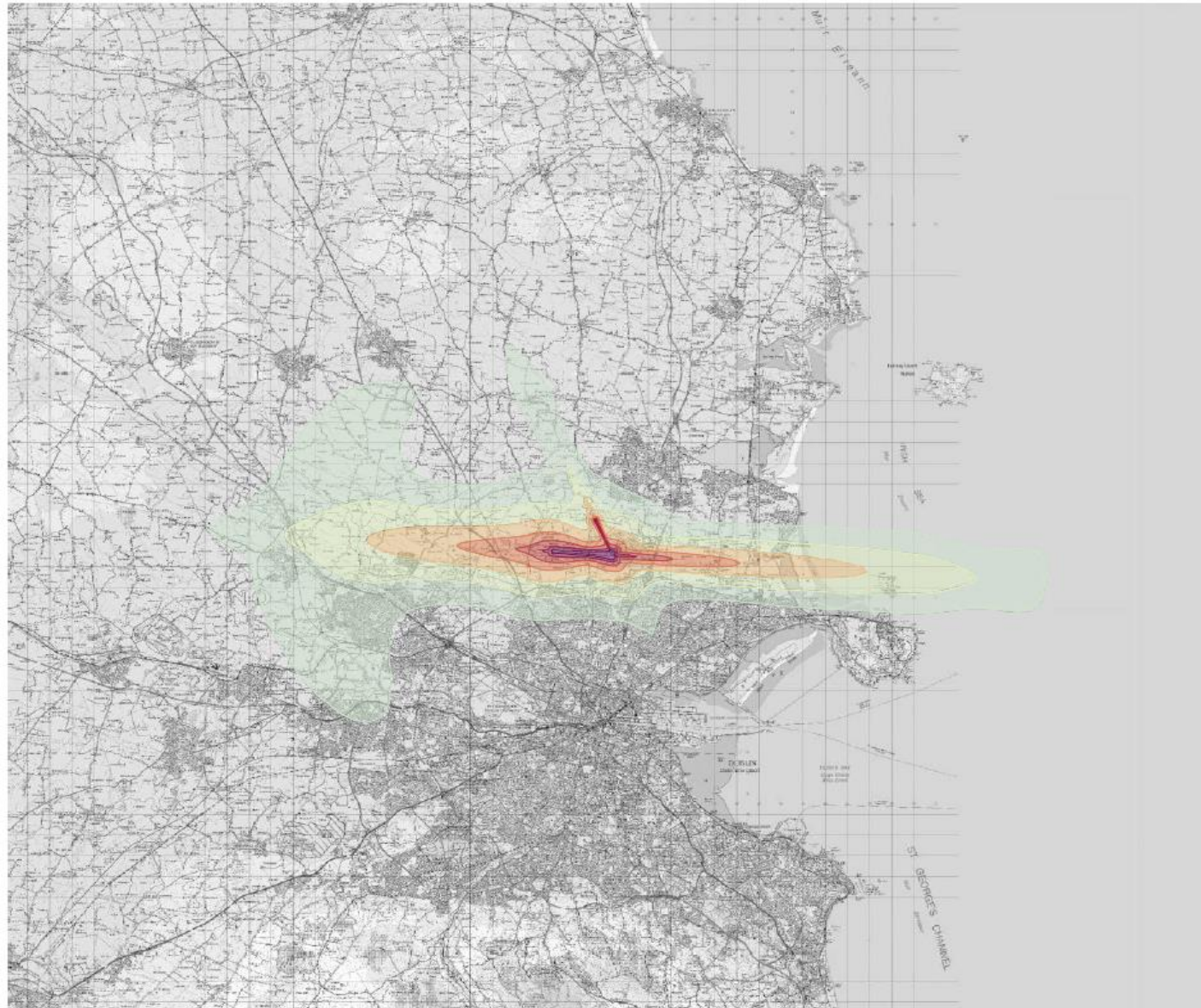
**Table 10 – Contour Areas, LAeq,16h Metric**

Metric Value, dB L <sub>Aeq,8h</sub>	Contour Area, km <sup>2</sup>	
	2020	2019
≥ 45	66.1	140.1
≥ 48	37.3	84.8
≥ 51	19.7	50.8
≥ 54	10.4	27.8
≥ 57	5.5	14.4
≥ 60	3.0	7.6
≥ 63	1.6	4.1

**Table 11 – Contour Areas, LAeq,8h Metric**

All of the 2020 contours are smaller than their 2019 equivalents, due to the large reduction in movements in 2020, as a result of the COVID-19 pandemic.

The 2020 annual L<sub>den</sub> and L<sub>NIGHT</sub> contours are shown as well as Summer Day and Summer Night. A comparison of the 2019 and 2020 annual L<sub>den</sub> contours at 45 and 65 dB(A) is also shown.



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**LEGEND:**

- 45 - 49 dB(A)  $L_{den}$
- 50 - 54 dB(A)  $L_{den}$
- 55 - 59 dB(A)  $L_{den}$
- 60 - 64 dB(A)  $L_{den}$
- 65 - 69 dB(A)  $L_{den}$
- 70 - 74 dB(A)  $L_{den}$
- 75+ dB(A)  $L_{den}$

Rev	Date	Description	Initials

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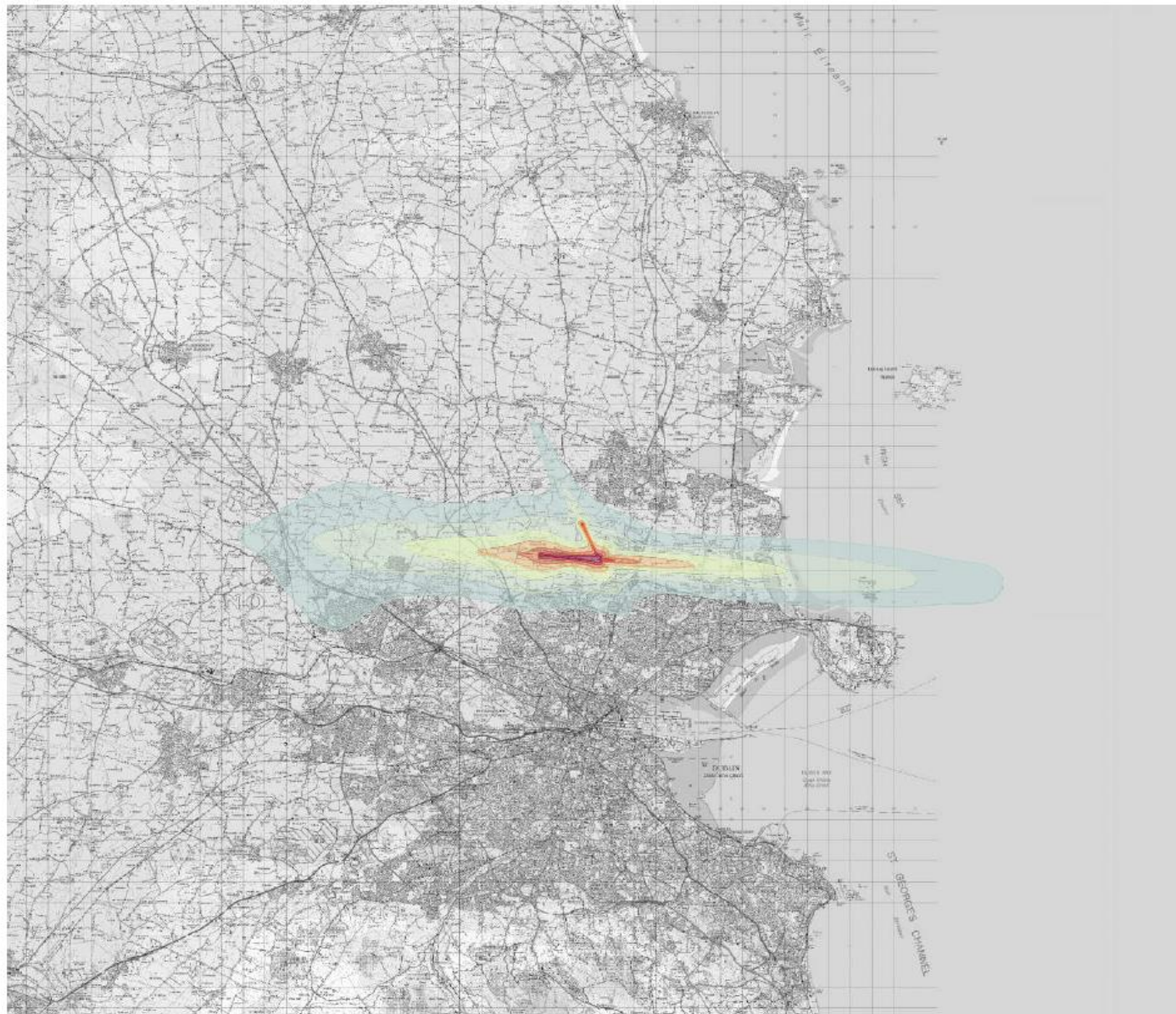
121 Salisbury Road, London, NW6 6RG  
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**Dublin Airport  
Annual Noise Contours**

**Figure 01  
2020 Annual  $L_{den}$  Noise Contours**








DRAWN: DR                      CHECKED: NW  
DATE: December 2021        SCALE: 1:250000@A4

Drawing No:  
**A11429\_01\_DR001\_1.0**



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**LEGEND:**

-  40 - 44 dB(A)  $L_{night}$
-  45 - 49 dB(A)  $L_{night}$
-  50 - 54 dB(A)  $L_{night}$
-  55 - 59 dB(A)  $L_{night}$
-  60 - 64 dB(A)  $L_{night}$
-  65 - 69 dB(A)  $L_{night}$
-  70+ dB(A)  $L_{night}$

Rev	Date	Description	Initials

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**Dublin Airport  
 Annual Noise Contours**

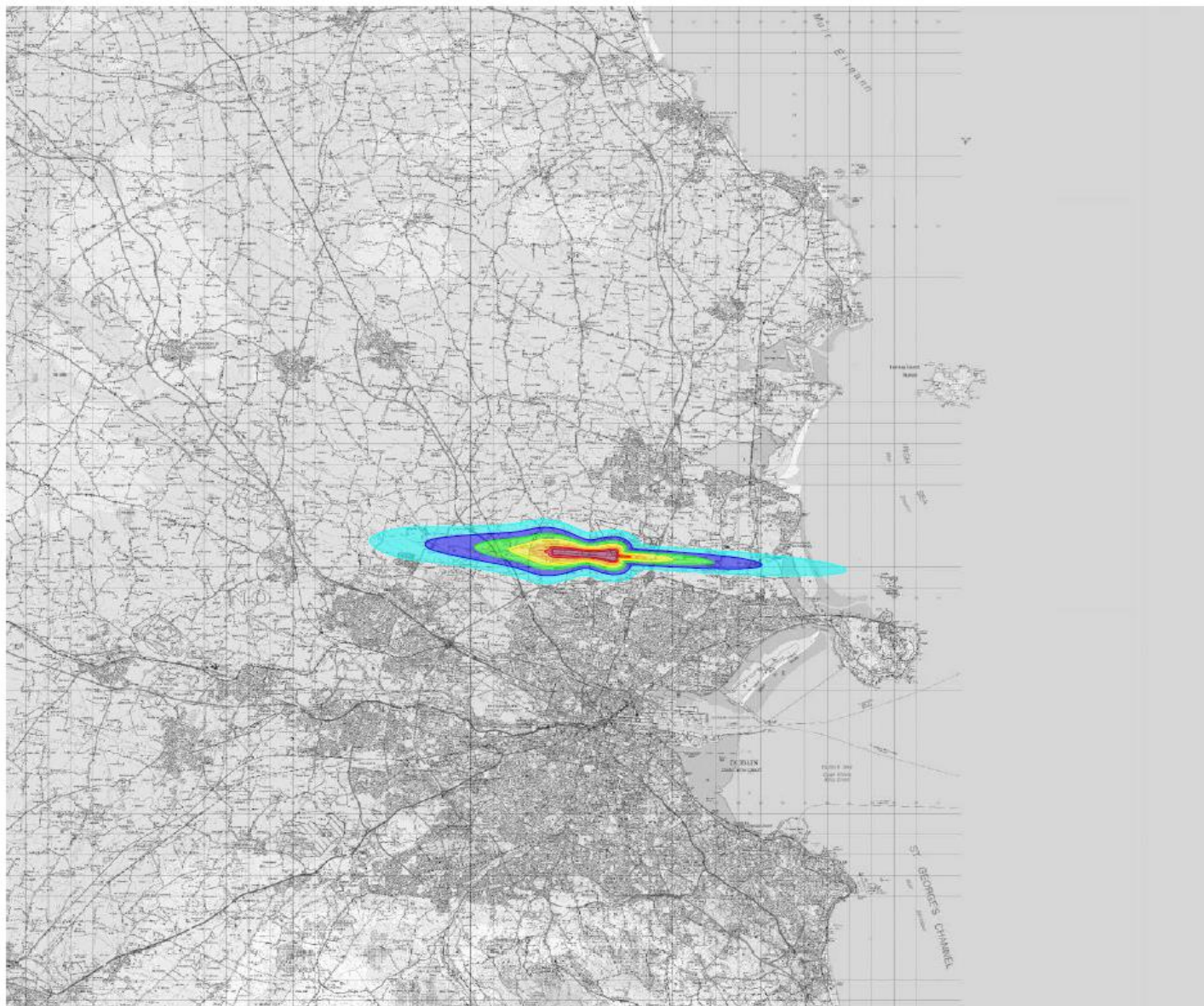
**Figure 02  
 2020 Annual  $L_{night}$  Noise Contours**

DRAWN: DR CHECKED: NW

DATE: December 2021 SCALE: 1:250000@A4

Drawing No:

**A11429\_01\_DR002\_1.0**



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**LEGEND:**

- 51 - 53 dB(A)  $L_{Aeq,16h}$
- 54 - 56 dB(A)  $L_{Aeq,16h}$
- 57 - 59 dB(A)  $L_{Aeq,16h}$
- 60 - 62 dB(A)  $L_{Aeq,16h}$
- 63 - 65 dB(A)  $L_{Aeq,16h}$
- 66 - 68 dB(A)  $L_{Aeq,16h}$
- 69+ dB(A)  $L_{Aeq,16h}$

Rev	Date	Description	Initials

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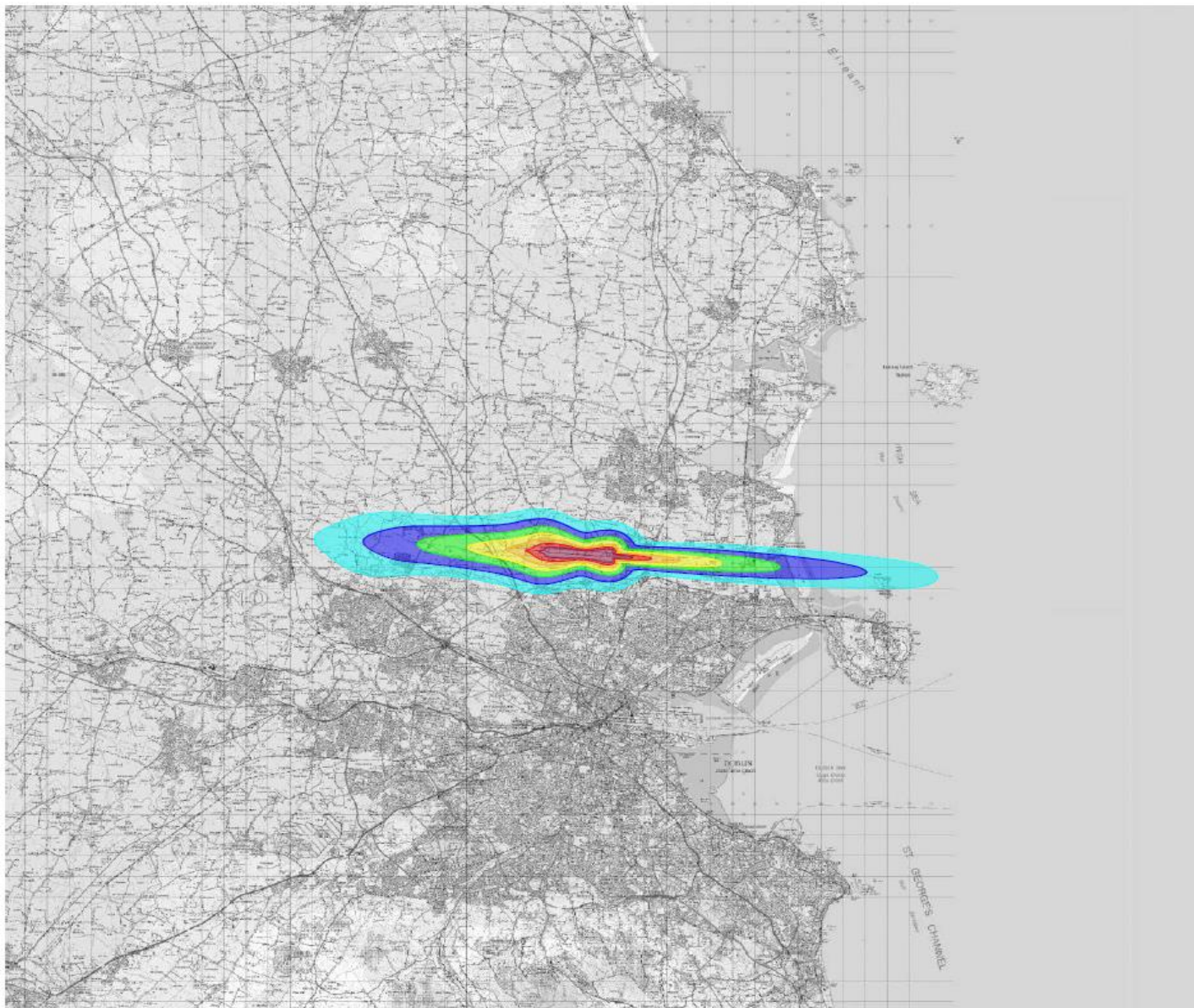
121 Salusbury Road, London, NW6 6RG  
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**Dublin Airport  
 Annual Noise Contours**

**Figure 03  
 2020 Summer Day Noise Contours**

DRAWN: DR CHECKED: NW  
 DATE: December 2021 SCALE: 1:250000@A4

Drawing No:  
**A11429\_01\_DR003\_1.0**



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**LEGEND:**

- 45 - 47 dB(A)  $L_{Aeq,8h}$
- 48 - 50 dB(A)  $L_{Aeq,8h}$
- 51 - 53 dB(A)  $L_{Aeq,8h}$
- 54 - 56 dB(A)  $L_{Aeq,8h}$
- 57 - 59 dB(A)  $L_{Aeq,8h}$
- 60 - 62 dB(A)  $L_{Aeq,8h}$
- 63+ dB(A)  $L_{Aeq,8h}$

Rev	Date	Description	Initials

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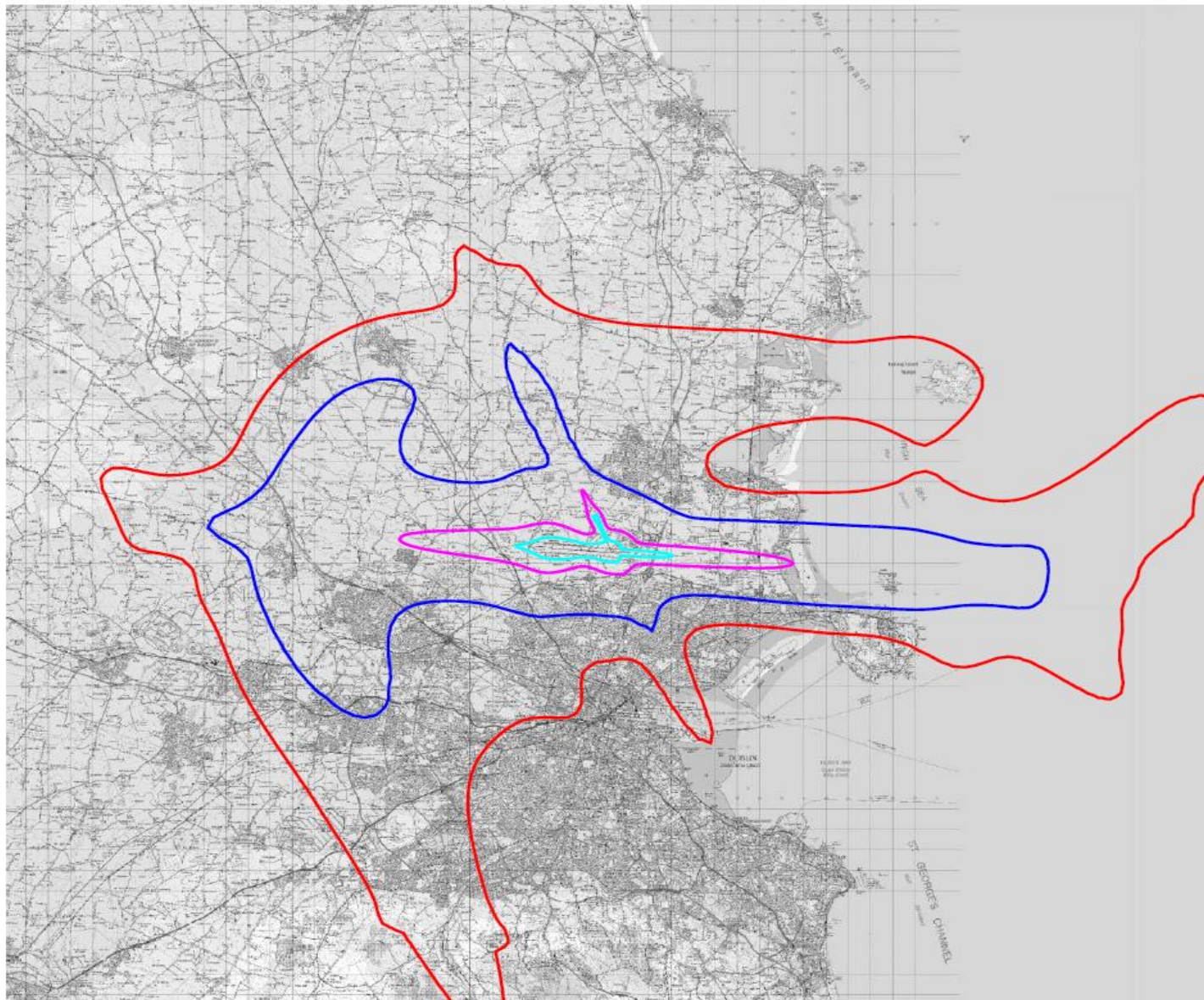
**Dublin Airport  
Annual Noise Contours**

**Figure 04  
2020 Summer Night Noise Contours**

**DRAWN:** DR                      **CHECKED:** NW  
**DATE:** December 2021      **SCALE:** 1:250000@A4

**Drawing No:**  
**A11429\_01\_DR004\_1.0**





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**LEGEND:**

- Noise Contours,  
 — 2019 45 dB(A)  $L_{den}$   
 — 2019 65 dB(A)  $L_{den}$   
 — 2020 45 dB(A)  $L_{den}$   
 — 2020 65 dB(A)  $L_{den}$

Rev	Date	Description	Initials

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**Dublin Airport  
 Annual Noise Contours**

**Figure 05  
 Comparison of 2019 and 2020  
 Annual  $L_{den}$  Noise Contours**

DRAWN: DR CHECKED: NW

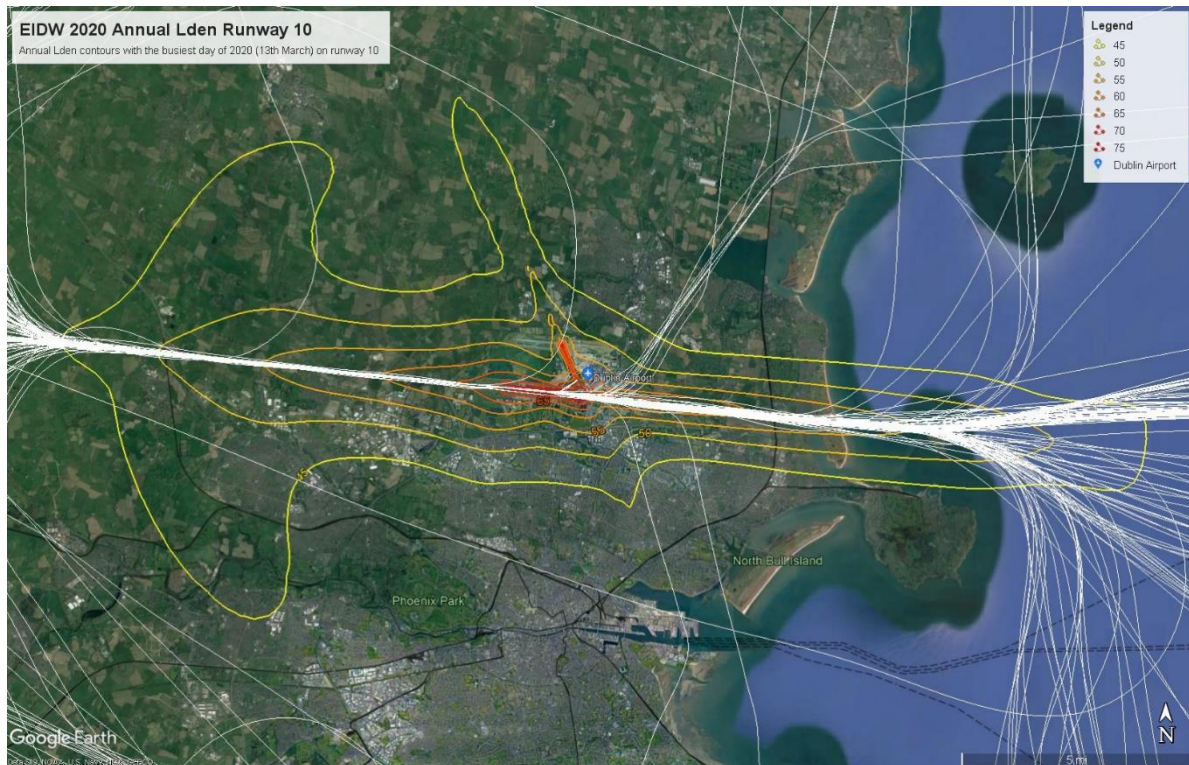
DATE: December 2021 SCALE: 1:250000@A4

Drawing No:

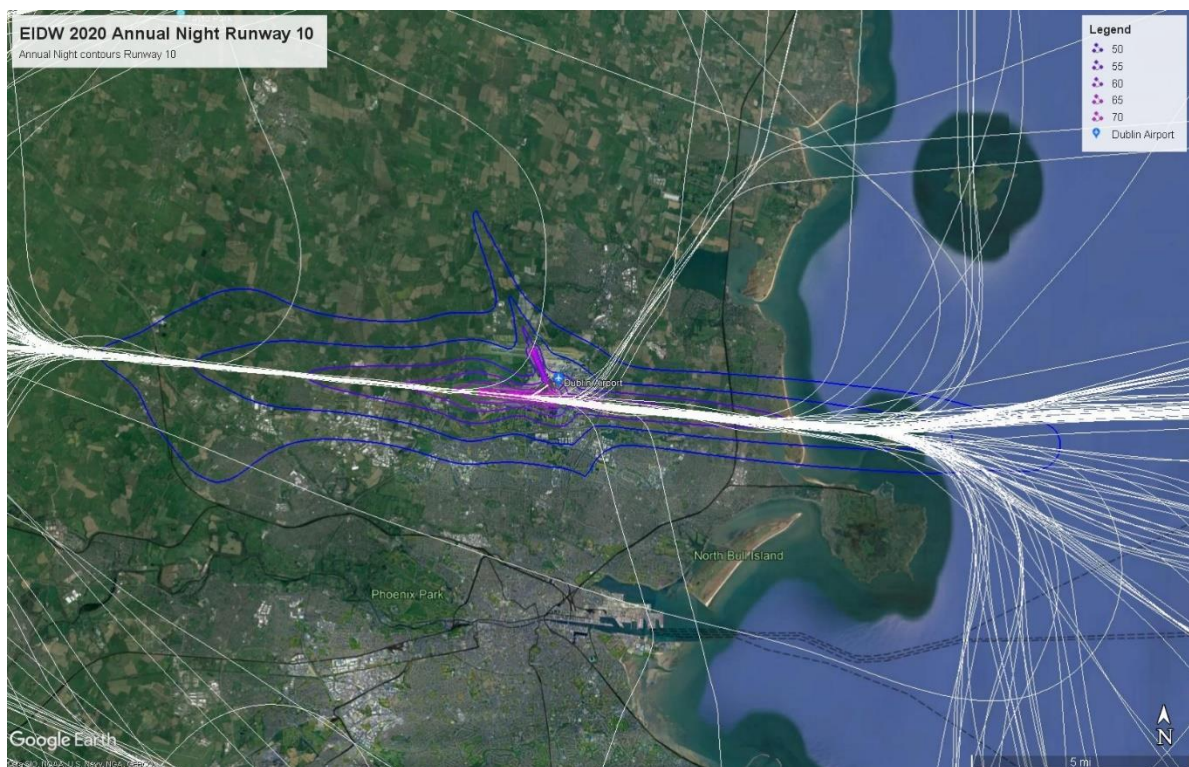
**A11429\_01\_DR005\_1.0**

### Contour Map Busiest Day Overlay

The figures below set out the 2020 aircraft noise contours of L<sub>DEN</sub> and L<sub>NIGHT</sub> with the typical busiest day aircraft tracks for each RWY. The distribution of aircraft operations can be related directly with the modelled noise impact.



**Fig. 52: Annual L<sub>DEN</sub> RWY 10 – Busiest day Flight tracks**



**Fig. 53: Annual L<sub>NIGHT</sub> RWY 10 – Busiest day Flight tracks**

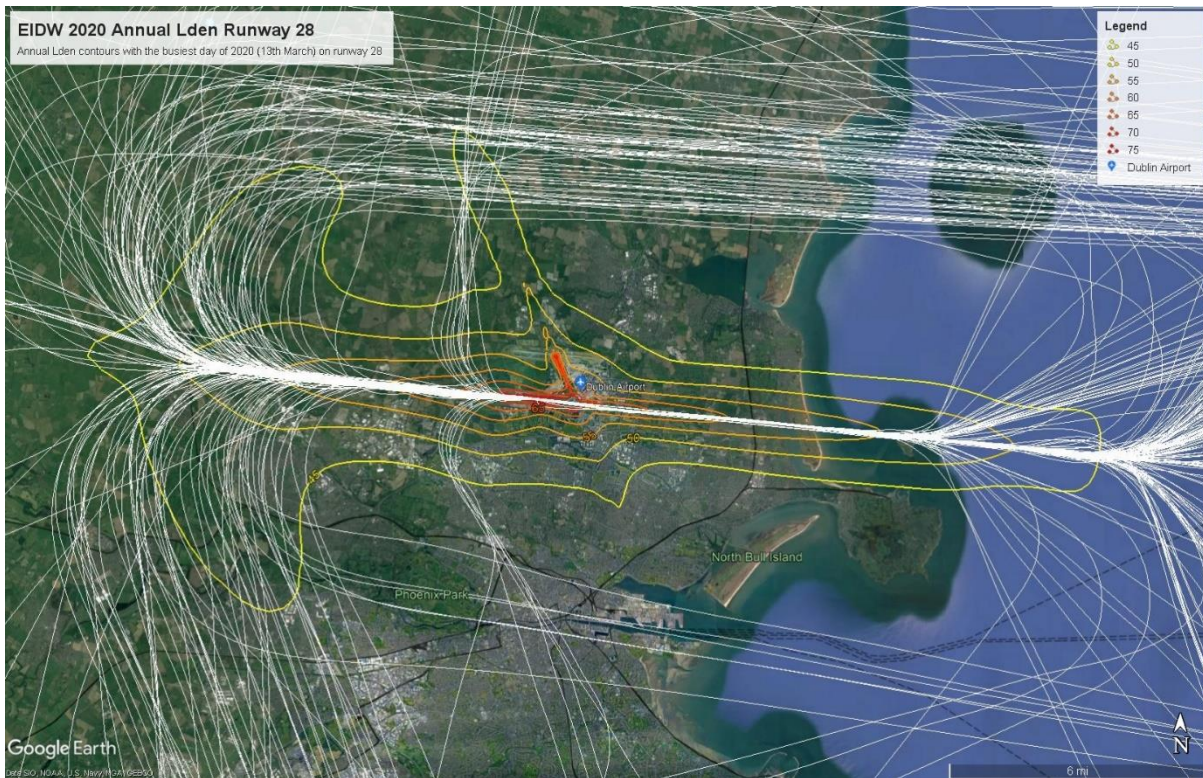


Fig. 54: Annual L<sub>DAY</sub> RWY 28 – Busiest day Flight tracks

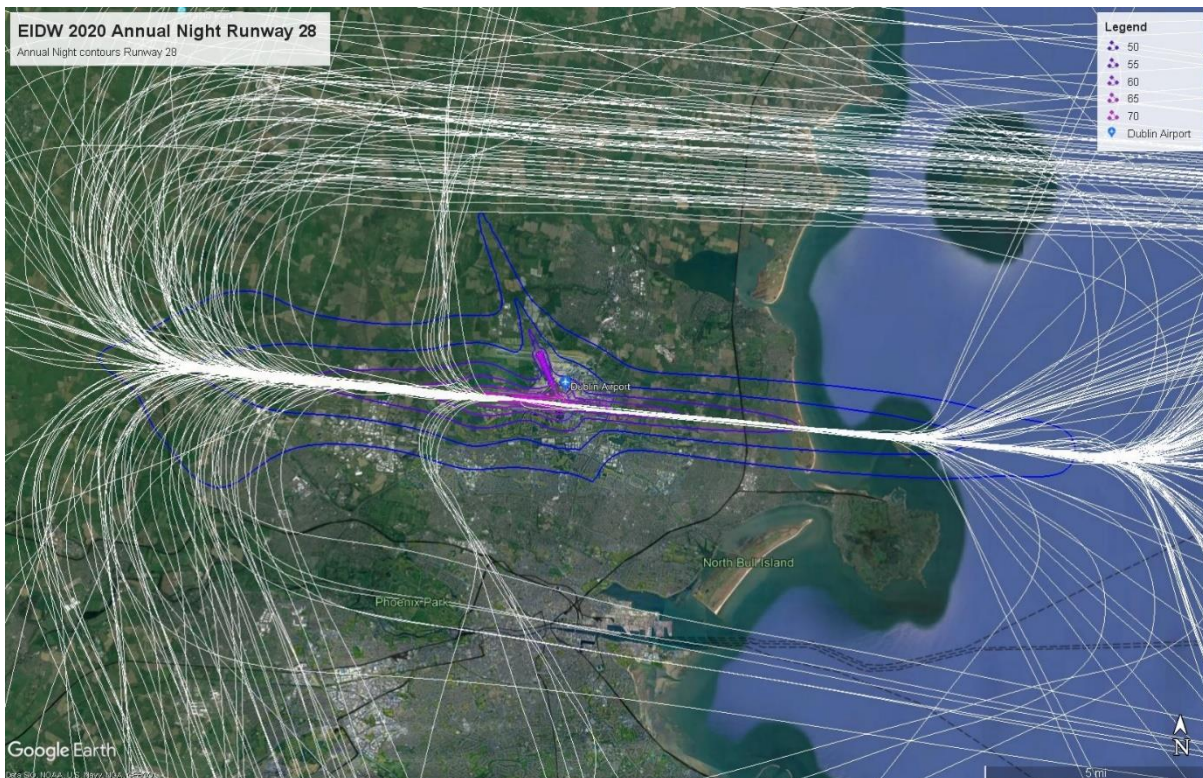
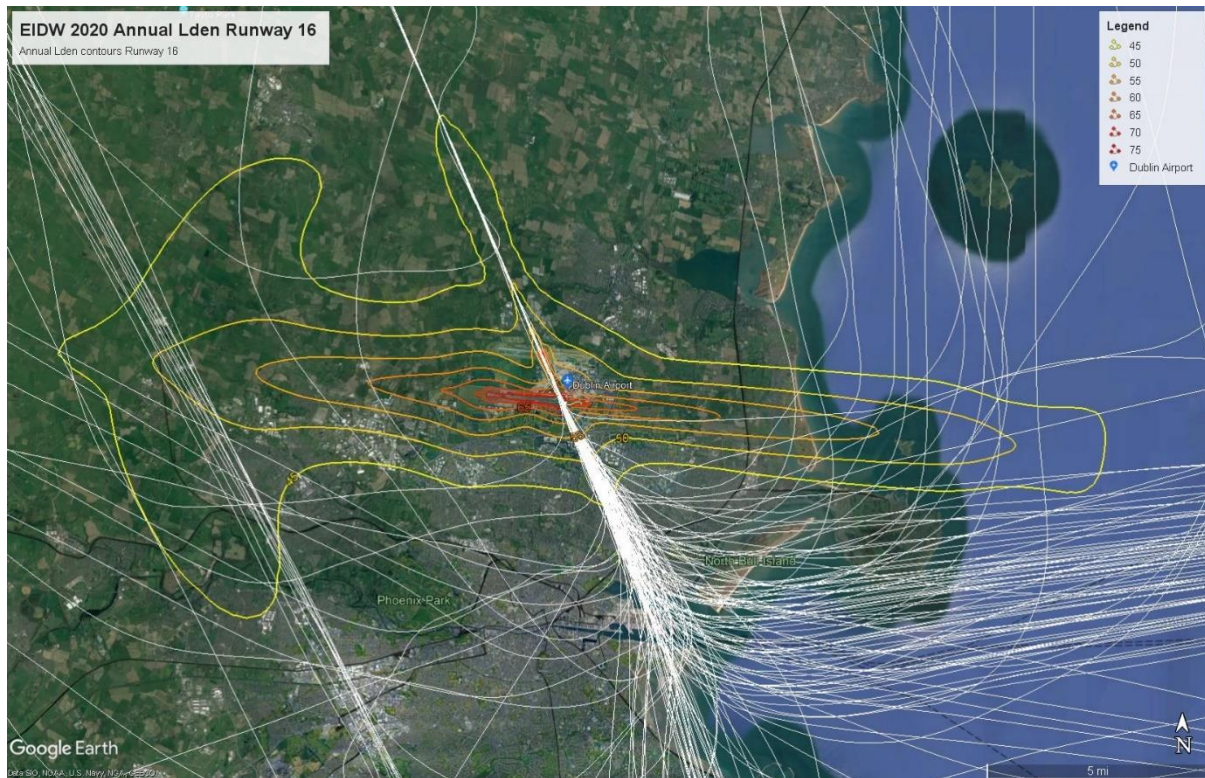
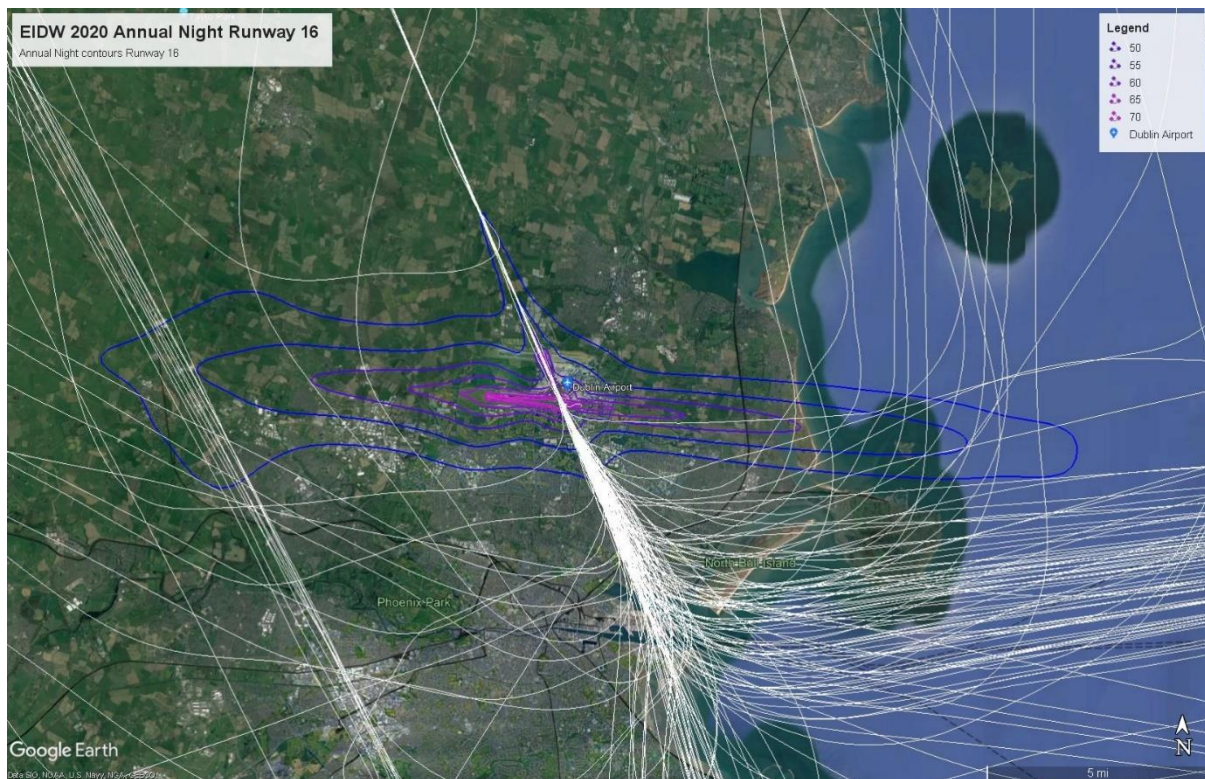


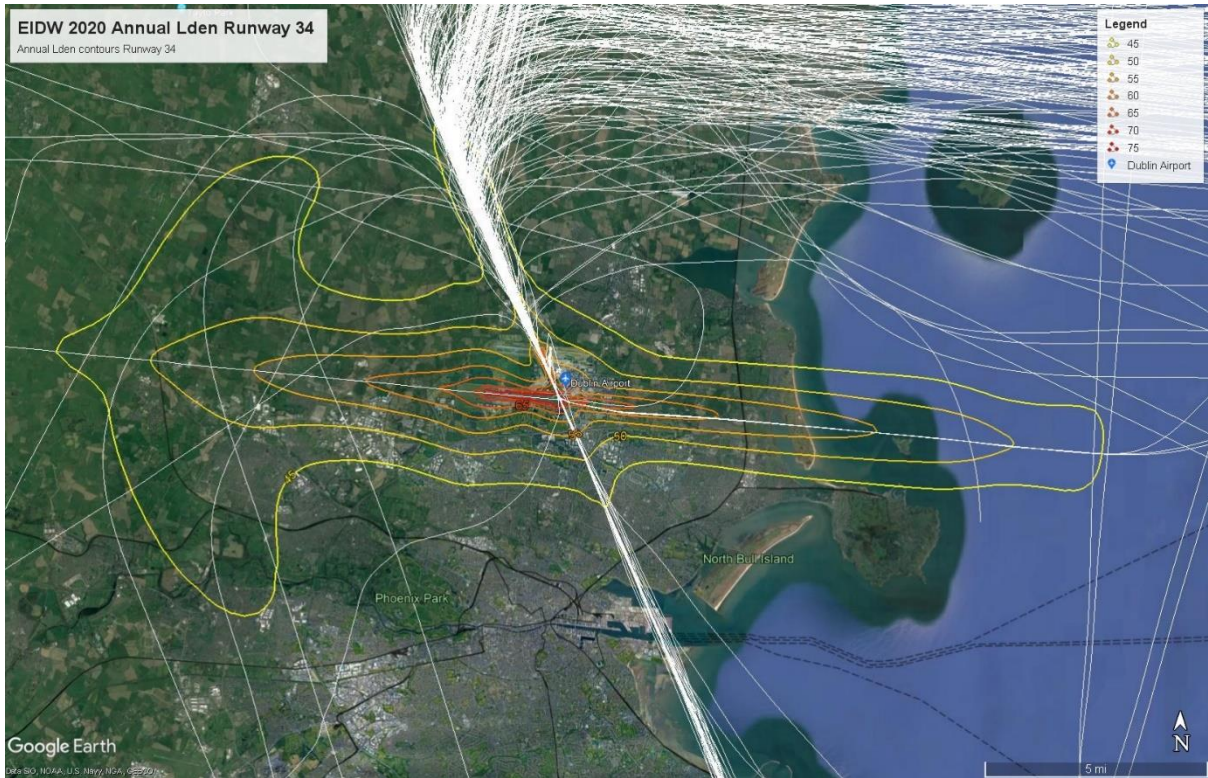
Fig. 55: Annual L<sub>NIGHT</sub> RWY 28 – Busiest day Flight tracks



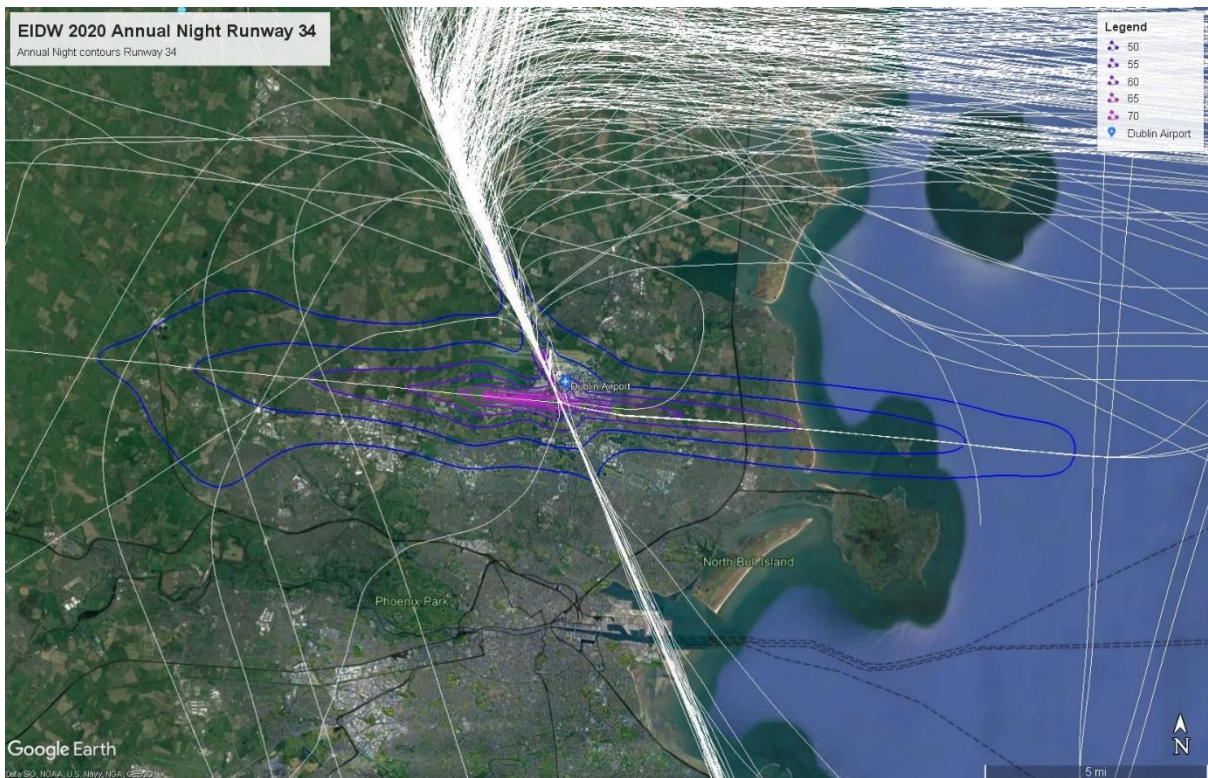
**Fig. 56: Annual L<sub>DEN</sub> RWY 16 – Busiest day Flight tracks**



**Fig. 57: Annual L<sub>NIGHT</sub> RWY 16 – Busiest day Flight tracks**



**Fig. 58: Annual L<sub>DEN</sub> RWY 34 – Busiest day Flight tracks**



**Fig. 59: Annual L<sub>NIGHT</sub> RWY 34 – Busiest day Flight tracks**

## Compliance with Noise Mitigation Measures

Table 12 details the noise mitigations in place at Dublin and provides further information on the method of monitoring in place and other measures to ensure compliance. An opinion on compliance with the relevant noise measure is provided and where possible this is evidenced with statistics referencing the preceding year. A general statement on the performance and effectiveness is given that is further expanded within the *Opportunities for Improvement* section.

Noise Mitigation Measures								
Reduction of Noise at Source								
Ref	Source	Description	Method of Monitoring/Systems		Other Measure/Enforcement	Opinion on Compliance	Effectiveness/Performance	
			Method	System				
NS-1	FCC-NAP	Encourage daa to promote quieter aircraft through incentives such as FlyQuiet programme	Quarterly Fleet Declaration reviews compiled by daa Shared Services Centre. Minuted DAOPG meetings.	N/A	Engagement with Airlines is undertaken via the monthly DAOPG meetings.	In Progress	A definitive FlyQuiet style programmes are normally in place at the airport. Metrics, methodology and reporting forum to be agreed with Airport users for implementation and tracking through DAOPG.	
NS-2	FCC-NAP	Encourage daa to work with airline partners to introduce quieter aircraft, particularly at night – including consideration of incentives	Quarterly Fleet Declaration review compiled by daa Shared Services Centre is tracked for metrics and improvement.	N/A	Airline performance and general aviation noise metrics are included as standing item on monthly DAOPG meeting held by daa with all relevant Airport Users.	In Progress	Approaches to improved incentives are under development within a wider Environmental Noise Charging review. Further consultation will take place with airport users during Q3 and Q4 2021. It is anticipated that the charging structure will be in place by 2022.	
Noise Abatement Operating Procedures								
Ref	Source	Description	Method of Monitoring/Systems		Other Measure/Enforcement	Opinion on Compliance	Effectiveness/Performance	
			Method	System				
NA-1	FCC NAP; daa NMP; AIP;	Two Runway Preferential Runway Programme	Flight Track Keeping	ANOMS	Enforcement of NA-1 not applicable. IAA ANSP determine RWY usage based on aviation safety and environmental considerations. Preferential routing mandated in AIP.	Compliant		The low level of Arrivals on Rws 16, 28 and 34 respectively indicates close to minimum usage and adherence to operating procedure. The low level of Departures off Rws 34,10 and 16 respectively indicates close to minimum usage and adherence to operating procedure.
						2019	2020	
						26% usage RWY 10	10.3% usage RWY 10	
						-1.5% usage RWY 16	1.5% usage RWY 16	
						72% usage RWY 28	86.8% usage RWY 28	
-0.5% usage RWY 34	0.5% usage RWY 34							
							0.9% Helicopter	
NA-2	FCC NAP; daa NMP; AIP;	Two Runway Noise Preferential Routes (NPR's) and Track Keeping -	Flight Track Keeping	ANOMS	daa Noise Management Plan sets out track keeping procedures and where required processes to escalate	Compliant		Requirement for improvement to Track Keeping against all off track violations identified. The 2020 performance figure includes those violations that took place off airport campus.
						2019	2020	
						99.2% Track Keeping	99.14% Track Keeping	
NA-3	FCC NAP; daa NMP; AIP;	Noise Abatement Departure Procedures (NADP) Climb Profile	Currently there is no know method to automatically track compliance with NADP.	N/A	NADP is mandated within the AIP. daa engages with Airport Users on implemented NADP.	Opinion not available at this time	Currently exploring the potential to complete surveys with Airport users and through DAOPG engagement. Promulgation of NADP 2 into AIP commenced in 2020.	
NA-4	FCC NAP	Visual Approach Jet Aircraft (Cat C/D)	Currently system monitors all approaches but cannot distinguish between visual approach and instrument approach.	N/A	Visual approach of Jet Aircraft (Cat C/D) is mandated within the AIP. Air Traffic Control maintains written procedures to join final approach track closer than 6nm from touchdown.	Opinion not available at this time	Track Keeping statistics indicate good performance and adherence to procedures.	
NA-5/6	IAA ATC	Continuous Climb Operations / Continuous Decent Approach	Monitoring, tracking and performance measurement performed by Performance Review division of	EUROCONTROL	Statutory monitoring and reporting via IAA-ANSP and EUROCONTROL.	Compliant		CCO % Compliance indicates good performance. Relatively lower CDO % compliance indicative of air space and current procedures in place at Dublin Airport
						2019	2020	
						CCO - 99.4% below FL 105. CDO - 53.5% below FL75	CCO - 99.8% below FL 105. CDO - 58.3% below FL75	
NA-7	FCC NAP; daa NMP; AIP;	Reverse Thrust	Currently no method of monitoring	N/A	Limited use of reverse thrust is mandated within the AIP.	Opinion not available at this time	Investigation of potential monitoring measures to be reviewed as part of wider technical review and assessment of systems.	
NA-8	FCC NAP; daa NMP; AIP;	Engine Ground Running	Monitoring completed by daa Airside Management Unit and compiled in local operations log.	N/A	Requirement within Aerodrome Manual Direction 6.10 and mandated within the AIP.	Compliant		Performance is adequate although can be improved.
						2019	2020	
						96% compliance 20:00-07:00. 95.95% compliance 07:00-09:00 CAT C/D only	97% compliance 20:00-07:00. 98.25% compliance 07:00-09:00 CAT C/D only	
NA-9	FCC NAP; daa NMP;	Monitor and Report	General text detailing NFTMS operations	ANOMS, Webtrak	daa Noise Management Plan sets out monitoring and reporting requirements and procedures	Partial compliance	Requirement for improvement to monitoring and reporting of all off track violations identified. Appropriate process and procedure for handling relevant individual or summary data for investigation by ANSP is required.	

Land Use Planning & Management								
Ref	Source	Description	Method of Monitoring/Systems		Other Measure/Enforcement	Opinion on Compliance		Effectiveness/Performance
			Method	System				
LU-5	FCC NAP; daa NMP;	Sound Insulation (RNIS)	Community Engagement Department, Communications Department	N/A	Condition 7 of An Bord Pleanala Planning Permission NR	Compliant		142 of 200 houses completed. Programme in place to complete remainder.
LU-6	NR - RFI 116	Voluntary Dwelling Purchase Scheme	Community Engagement Department, Communications Department	N/A	Condition 6 of An Bord Pleanala Planning Permission NR	Compliant		33 eligible dwellings all offered VDPS. 3 no. properties acquired to date.
LU-7	NR - RFI 116	Voluntary School Sound Insulation	Community Engagement Department, Communications Department	N/A	Condition 9 of An Bord Pleanala Planning Permission NR	Compliant		6 eligible schools acoustically tested. 3 of 4 qualifying schools have had or are in the process of having measures installed.
Monitoring & Community Engagement								
Ref	Source	Description	Method of Monitoring/Systems		Other Measure/Enforcement	Opinion on Compliance		Effectiveness/Performance
			Method	System				
CE-1	FCC NAP; daa NMP;	Stakeholder Engagement	Community Engagement Department, Communications Department	N/A	DAOPG/Scheduled Meetings	Compliant		DAOPG well established and attended. Programme in place to complete remainder.
CE-2	FCC NAP; daa NMP;	Community Engagement Programme	Community Engagement Department, Communications Department	N/A	Condition 28 of An Bord Pleanala Plan	Compliant		CLG, DAEWG and drop in clinic forums well established and attended.
CE-3	FCC NAP; daa NMP;	Noise & Flight Track Monitoring System	Collation of data on aircraft movements and the measurement of resultant noise	ANOMS/WebTrak	N/A	Compliant		The NFTMS has continued to enable the analysis of aircraft movements to assess whether they are operating within defined corridors. The measurement of resultant noise levels at key locations on the approach and departure routes has been maintained throughout 2020. Despite the impact of COVID-19 pandemic daa has maintained a high level of performance responding to complaints relating to aircraft noise. The commencement of a technical review on benchmarking for additional noise monitoring terminals will provide guidance on enhancements of the system. Appropriate additional fixed and/or mobile noise monitoring terminals.
CE-4	FCC NAP; daa NMP;	Noise Complaint Management Systems	Process and respond to all aviation related noise complaints in a timely manner	WebTrak, various	daa NMP, TBC	Not compliant		Performance significantly disrupted by COVID-19 pandemic. Manual nature of investigations and requirement for system access in both daa and IAA-ANSP not always possible through 2020.
						2019	2020	
						15,160 complaints / 15,160 complaints processed / 15,157 Complaints responded to / 56 of 56 complaints further investigated and closed	7,133 complaints / 7,133 complaints processed / 7,133 Complaints responded to / 39 of 96 complaints further investigated and closed	

**Table 12 – Noise Mitigations Measure Compliance Table**



## Opportunities for Improvement

The noise mitigation measure compliance table detailed in Table 12 presents an opinion on the effectiveness or performance of the relevant measure. This commentary has been reviewed against the relevant requirement within the Aircraft Noise (Dublin Airport) Regulation Act 2019, Part 4, section 19, and the source documents. Where technically feasible and possible, opportunities for improvement have been presented in Table 7. A number of these opportunities had been identified within 2020 and are currently in progress. The multi-disciplinary and agency requirements of some of the opportunities will require further investigation, review and consultation with Regulatory bodies and airport users ahead of any planned implementation.

<b>Opportunities for Improvement</b>						
<b>OFI</b>	<b>Ref</b>	<b>Criteria/Policy</b>	<b>Opportunity For Improvement finding:</b>	<b>Consultation Requirement</b>	<b>Status:</b>	<b>Expected Implementation:</b>
OFI-001	NA-2	Two Runway Noise Preferential Routes (NPR's) and Track Keeping	Efficient monitoring of movements against vectoring of aircraft would allow more streamlined approach to improved Track Keeping and Complaint handling.	Consultation with IAA-ANSP required to agree IT system management, work practice change and associated governance and protocol approval	Consultation to be commenced pending benchmark review against similar airport operations.	TBA
OFI-002	NA-3	Noise Abatement Departure Procedures (NADP) Climb Profile	Promulgate NADP 2 through AIP. Ensure annual survey completed by airport users on adherence to NADP 2 procedures.	Airport users, ANSP, daa Operations	Airport user engagement commenced. Support from IAA-ANSP received.	Q4 2021
OFI-003	NA-4	Visual Approach Jet Aircraft (Cat C/D)	The NFTMS is unable to distinguish between an instrument or visual approach taken. Complete analysis on potential for use of joining point gate within ANOMS to provide metrics on whether an aircraft has breached the Environmental Corridors. Thereafter discussions with IAA-ANSP could identify if vectored to do so.	Consultation with IAA-ANSP required to review potential for implementation.	Not commenced	TBA
OFI-004	NA-5/6	Continuous Climb Operations / Continuous Descent Operations	Potential for development of EIDW specific CCO/CDO procedures that would better reflect procedures at Dublin Airport. Possible use of shadow rule set to be investigated.	Consultation with IAA-ANSP required to review appropriateness and potential for implementation.	Not commenced	TBA
OFI-005	NA-7	Reverse Thrust	Investigation of potential monitoring measures to be reviewed as part of wider technical review and assessment of systems.	Airport user and internal consultation and engagement with subject matter experts.	Not commenced	TBA
OFI-006	NA-9	Monitor and Report	Update of complaint handling procedures to detail process for track violation reporting.	Internal consultation	Commenced	Q3 2021
OFI-007	NA-9	Monitor and Report	Review of NMT locations and requirement for additional monitoring to be completed. Engagement with relevant stakeholders and community with regard to site selection.	Community, ANCA, internal consultation	Commenced	Q4 2021

**Table 7 – Opportunities for improvement**

## Conclusion – Opinion on Compliance

The review completed by daa on the compliance of airport users with noise mitigation measures and operating restrictions has identified that there is general compliance with the majority of measures in place. On the basis of the information reviewed, conformance with and the noise mitigation measures and the requirements of The Aircraft Noise (Dublin Airport) Regulation Act 2019, Part 4, section 19 exists<sup>Note 1</sup>. Where minor non-conformities exist and are identified as part of the review, proposals are put forward as part of planned works to investigate the potential for monitoring against industry best practice. A number of these proposals will require significant engagement with airport users and regulatory bodies.

Note 1 Dublin Airport are in the process of investigating and proposing an overall performance indicator or hi level measure that will indicate annual compliance. The determination of the indicator(s) will be based on:

- Appropriateness for measuring and monitoring
- Ability to enable Dublin Airport adequately demonstrate noise performance improvement to the ANCA.

As Table 6 sets out there are 17 no. noise mitigation measures with individual variables that could significantly affect noise performance. Final details of the Noise Abatement Objective and the establishment of an appropriate measure will advise the relevant metric. In the interim, the determination of annual compliance for the purposes of the Aircraft Noise (Dublin Airport) Regulation Act 2019, Part 4, section 19 is based on:

- The preceding year of the report used as the baseline
- Equal weighting applied to each noise mitigation measure
- The sum balance of noise mitigation measures improving against those disimproving indicates compliance or otherwise

## Glossary/Abbreviations

A/B category aircraft	Category of smaller aircraft, containing propeller aircraft, turboprop aircraft, Whisperjets and other small general aviation aircraft powered by jets engines.
AIP	Aeronautical Information Procedure/Publication
ANCA	Aircraft Noise Competent Authority
ANSP	Air Traffic Service Provider
ANOMS	Advanced Noise & Track Monitoring System
ATSU	Air Traffic Service Unit
ATC	Air Traffic Control
CAR	Civil Aviation Regulator
C/D category aircraft	Large aircraft, such as Airbus and Boeing aircraft, Bombardier Canadair Regional Jet series, business jets and Embraer aircraft.
CCO	Continuous Climb Operations
CDO	Continuous Descent Operations
Clearway	End part of the runway
CLG	Community Liaison Group
daa	Dublin airport authority
NMP	Noise Management Plan
DAOPG	Dublin Airport Operations Planning Group
DAEWG	Dublin Airport Environmental Working Group
dB	Decibels, a unit of sound pressure
FCC NAP	Fingal County Council Noise Action Plan
HR	Hour
IAA	Irish Aviation Authority
ILS	Instrument Landing System
ICAO	International Civil Aviation Organisation
KT	knots
LA <sub>Eq</sub>	Equivalent average sound level
LA <sub>max</sub>	LA <sub>max</sub> is the maximum value that the A-weighted sound pressure level reaches during a measurement period

LAP	Local Area Plan
L <sub>den</sub>	L <sub>den</sub> is the weighted average of the yearly individual noise level during day, evening and night.
L <sub>night</sub>	L <sub>night</sub> is the weighted average of the yearly individual noise level specifically during the night (23:00 – 07:00)
MTOW	Maximum Take Off Weight
NADP	Noise Abatement Departure Procedures
NAO	Noise Abatement Objective
NM	Nautical Miles
NMP	daa Noise Management Plan
Reverse thrust	Using the engine of the aircraft for braking after landing on the runway
SID	Standard Instrument Departure

## Appendices

## Appendix A - IFP Listings for 2020

Appendix B - ICAO Chapter Compliance (Manufacturer MTOW)



Appendix C - NMT Dublin Noise Report

Appendix D - Progress Statement LU-5,6,7

Appendix E - Dublin Airport 2020 Noise Contours Report

## Appendix F - Noise Management Procedure

## Appendix G - Graphical Representation CDA Violations