# Annual Compliance Report

2020

# Contents

# 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 (1st Jan – 31st Dec) that is based on the requirements listed and report improvement correspondence received from the ANCA in 2020.

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 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 over7.39 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.

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.

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.

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 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 Routs 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 0900hrsequirement 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.
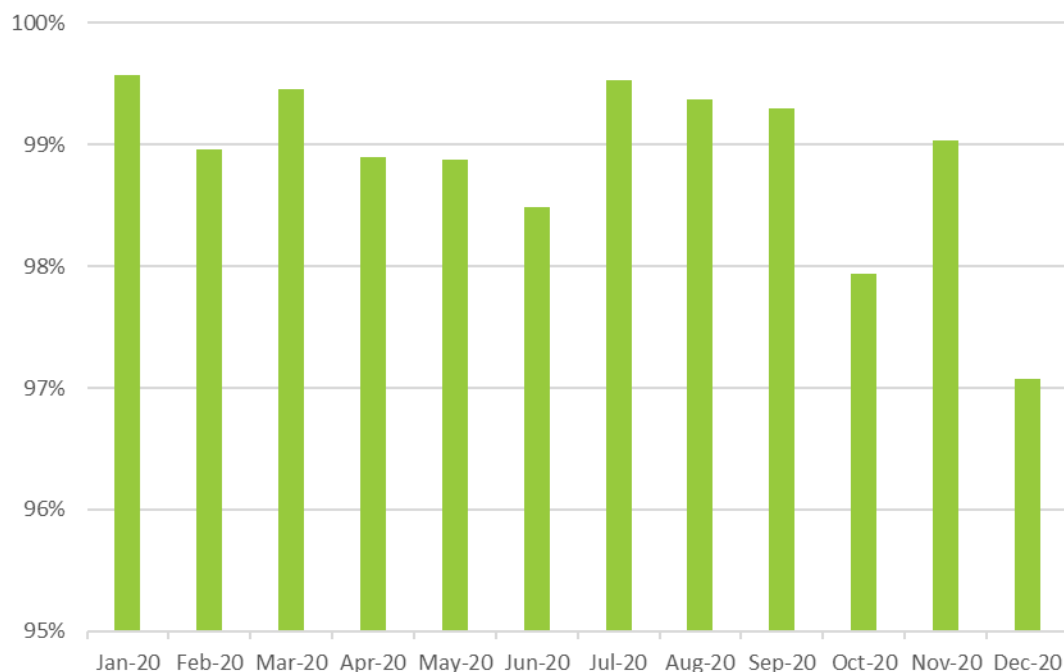


**Fig. 1 - Category C/D Aircraft On Track Performance 2020**
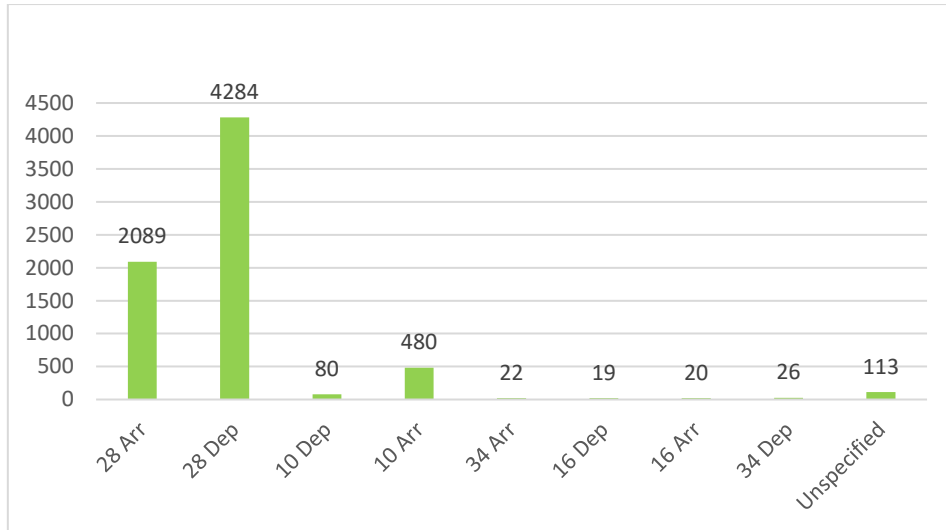
**Fig. 2 - Noise Complaint Analysis by Runway 2020**
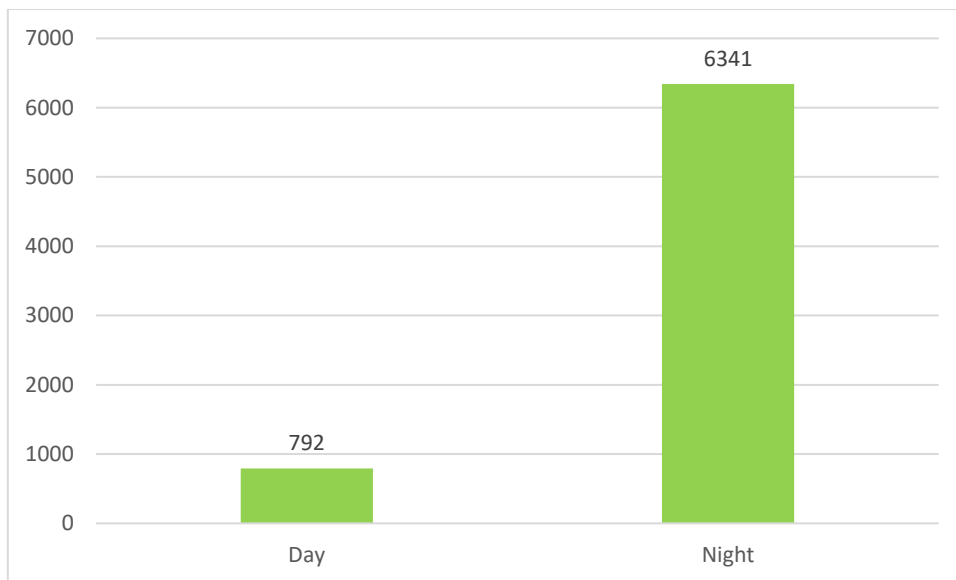


**Fig. 3 - Day / Night Noise Complaints 2020**
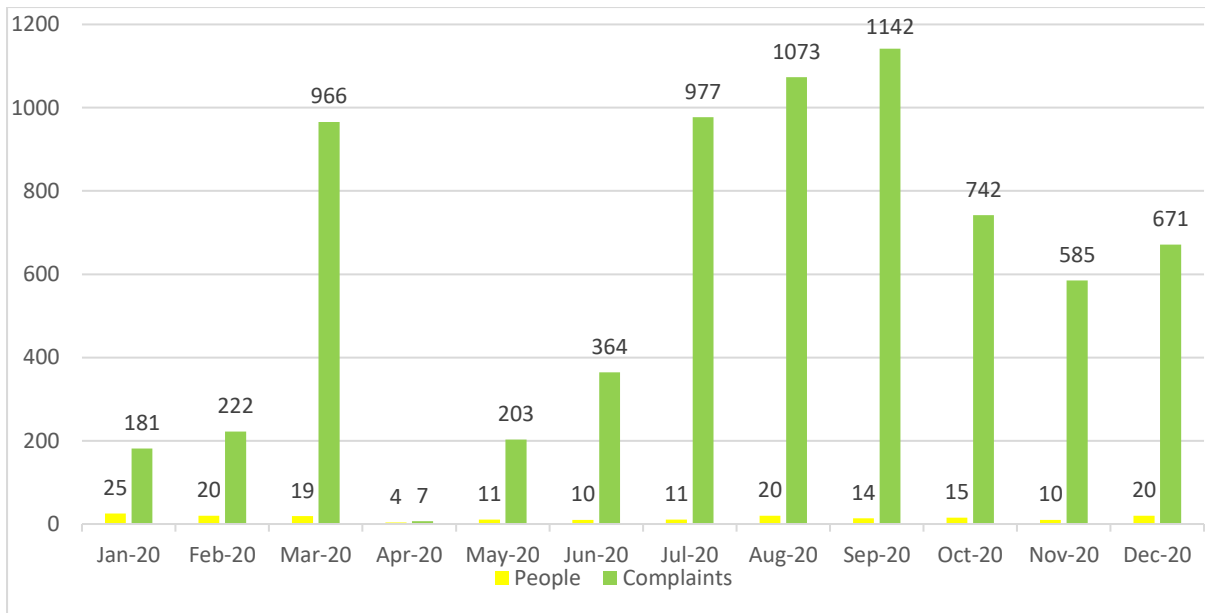
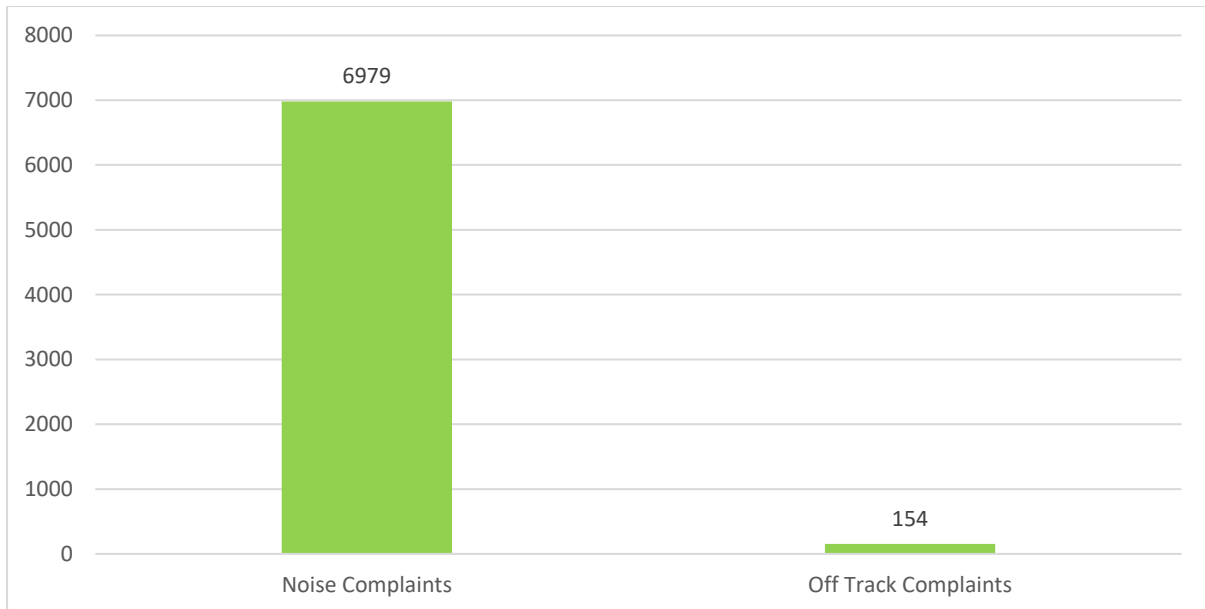**Fig. 4 - Noise Complaint Analysis 2020**



**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.
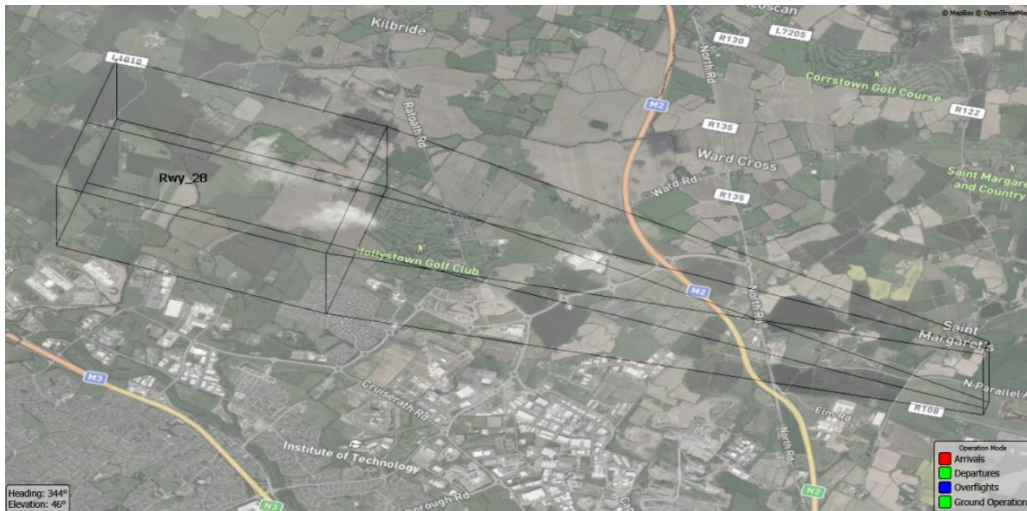
**Figure 6 – Environmental Noise Corridor**



**Fig. 7 – Environmental Noise Corridor**

## 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 8 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 7 below shows the location of the noise monitoring terminals in 2020. Refer to Appendix D for further detail.
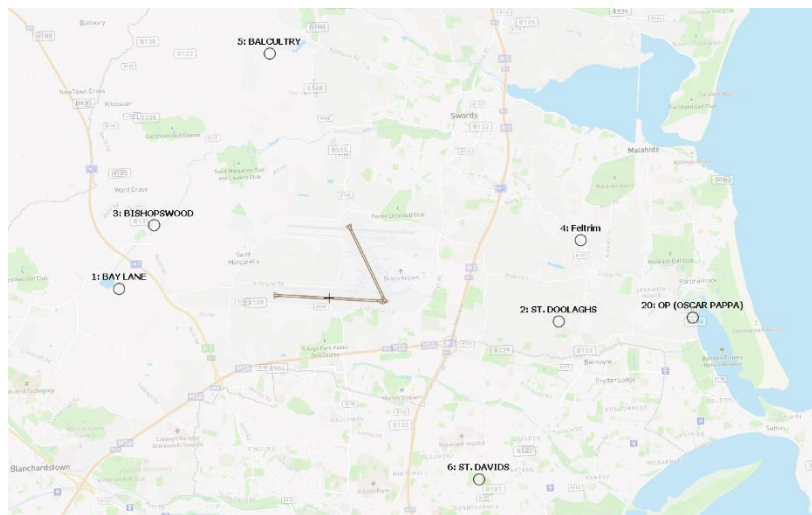


**Fig. 8 – Location of NMT's in 2020**

*NMT operational status 2020*

Figure 9 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.
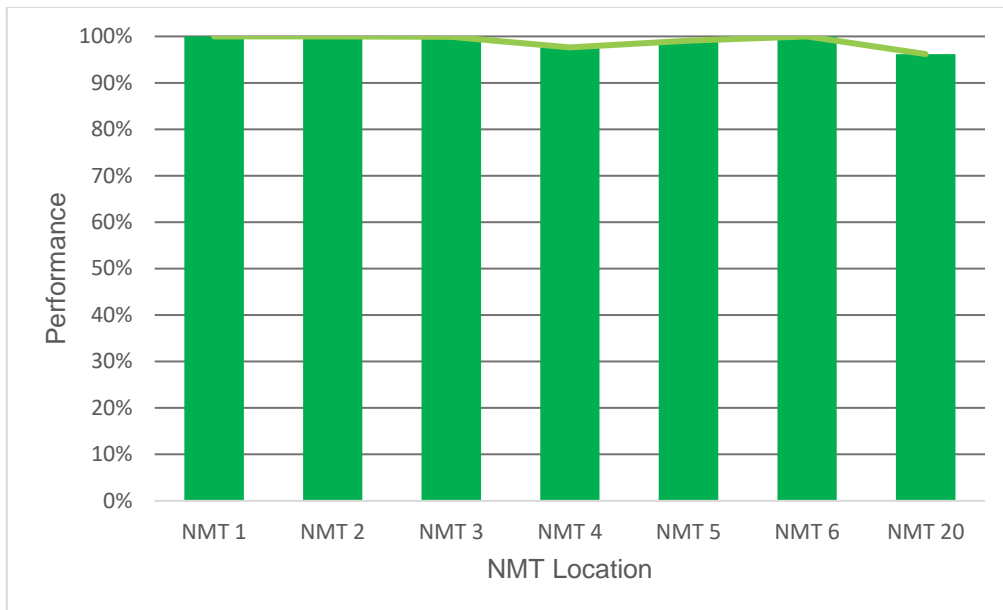
**Fig. 9 – Uptime and Operational Status of NMT's, January - December 2020**

*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. 10 below details the noise events breakdown by type for 2020.
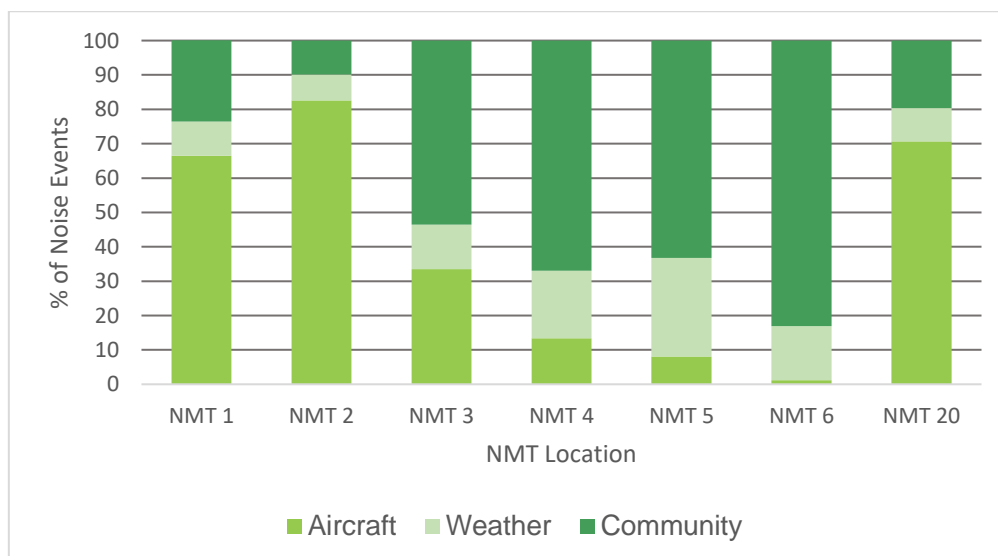


**Fig. 10 – Noise Events breakdown per NMT**

*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.
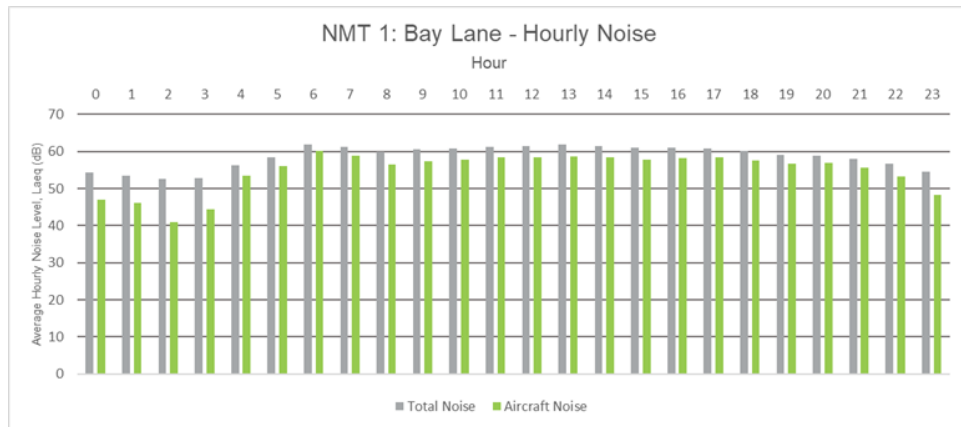
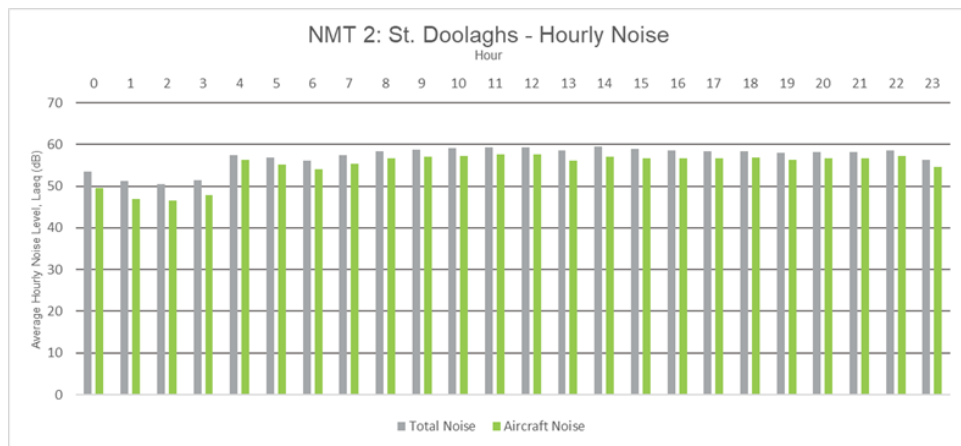

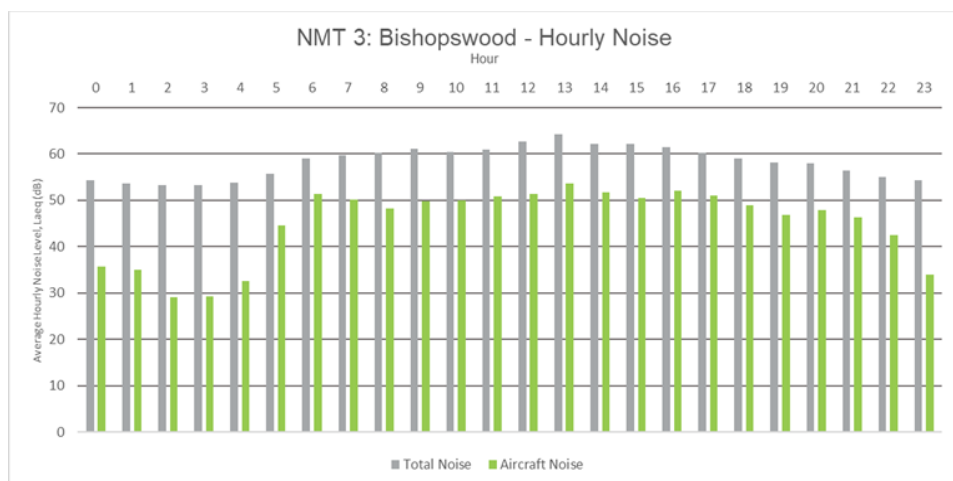**Fig. 11 – NMT 1 hourly noise**



**Fig. 12 – NMT 2 hourly noise**



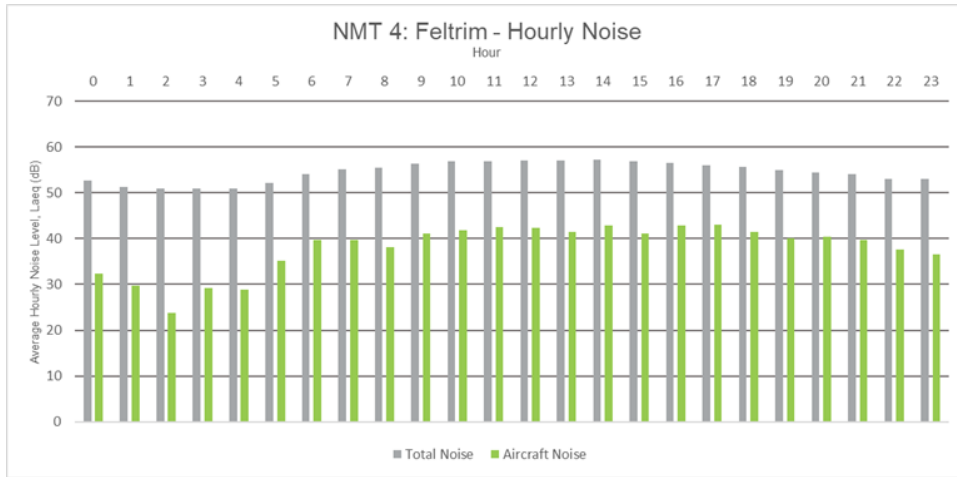**Fig. 13 – NMT 3 hourly noise**
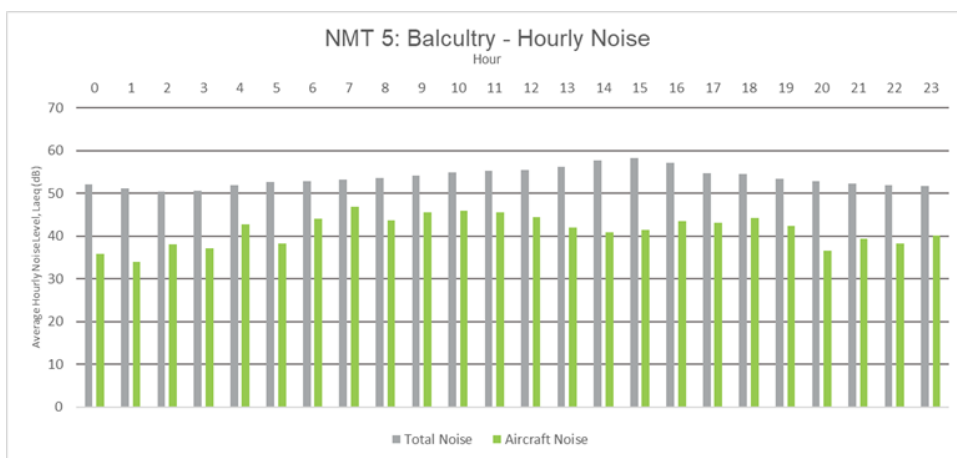
**Fig. 14 – NMT 4hourly noise**



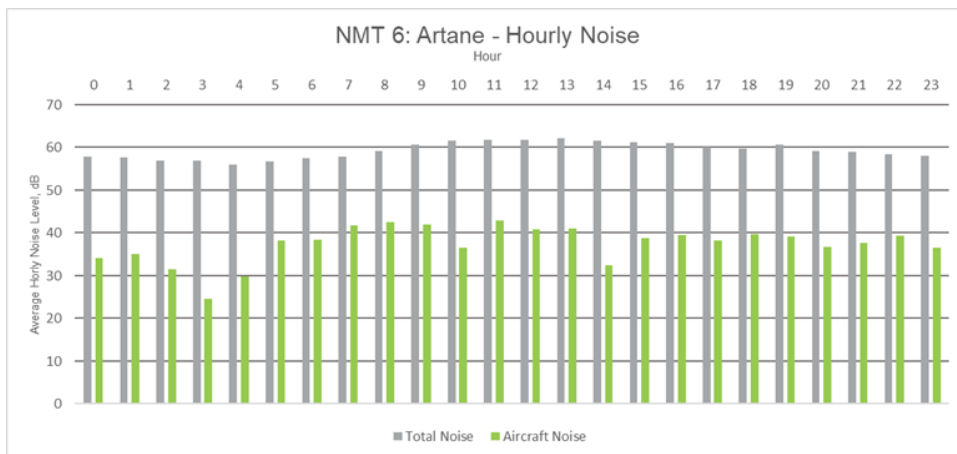**Fig. 15 – NMT 5 hourly noise**
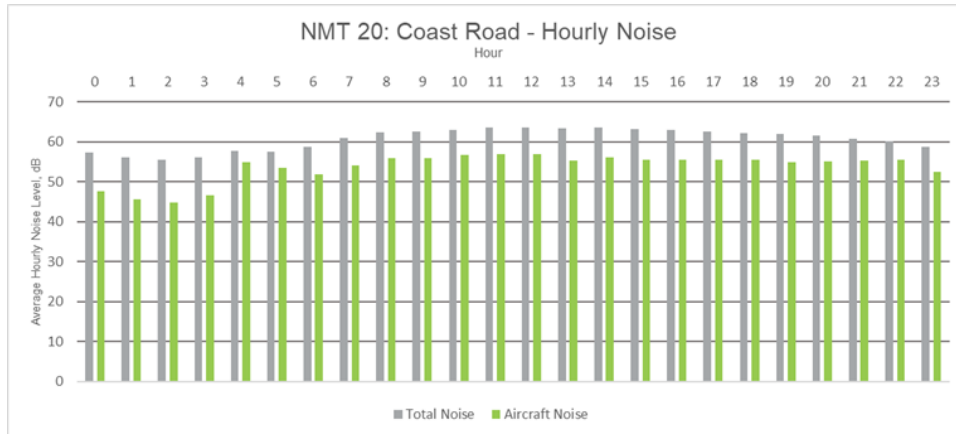


**Fig. 16 – NMT 6 hourly noise**

**Fig. 17 – 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.
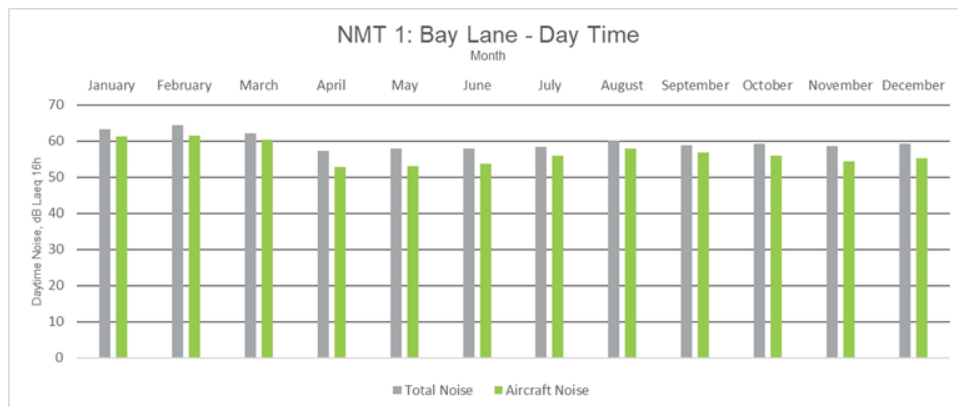


**Fig. 18 – NMT 1 day time noise**



**Fig. 19 – NMT 2-day time noise**
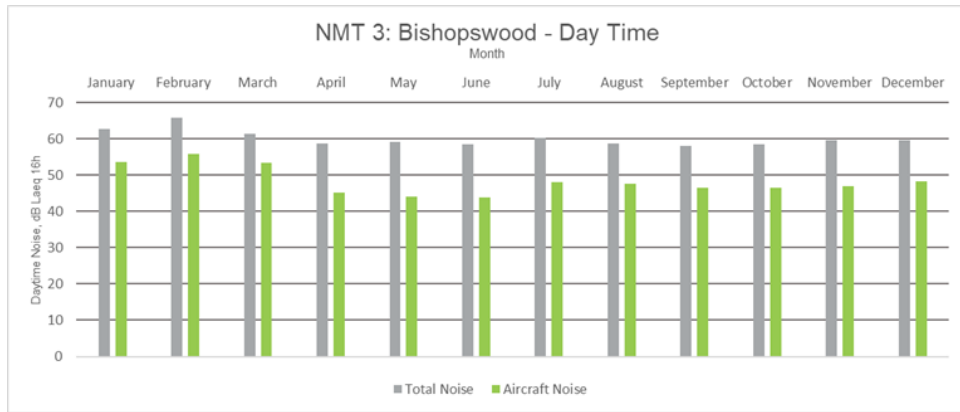
**Fig. 20 – NMT 3-day time noise**
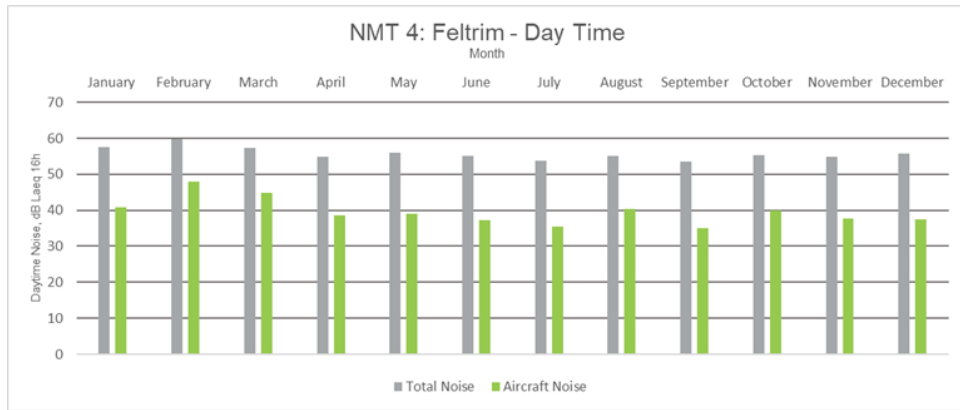


**Fig. 21 – NMT 4-day time noise**
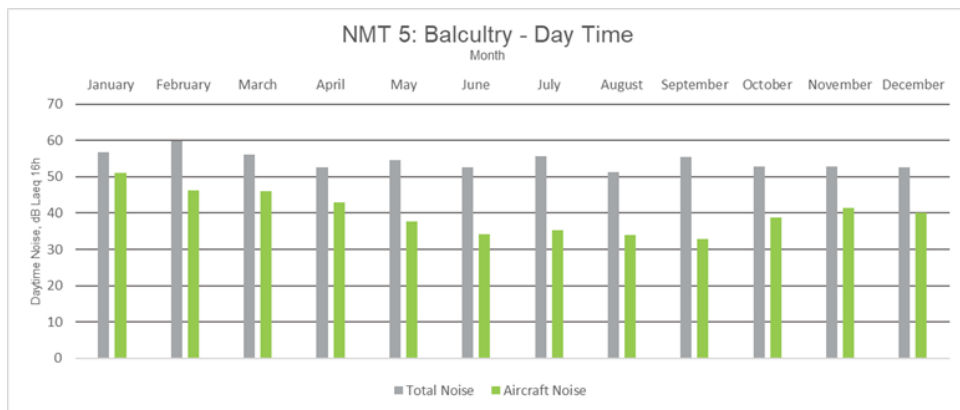


**Fig. 22 – NMT 5-day time noise**
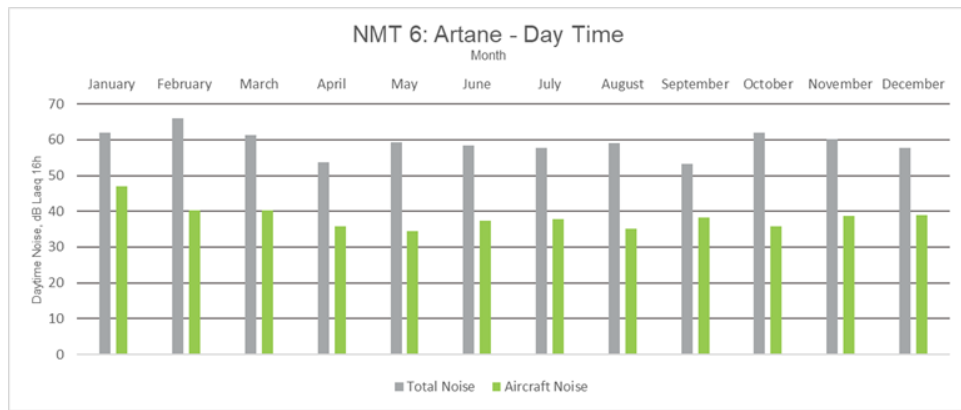
**Fig. 23 – NMT 6-day time noise**
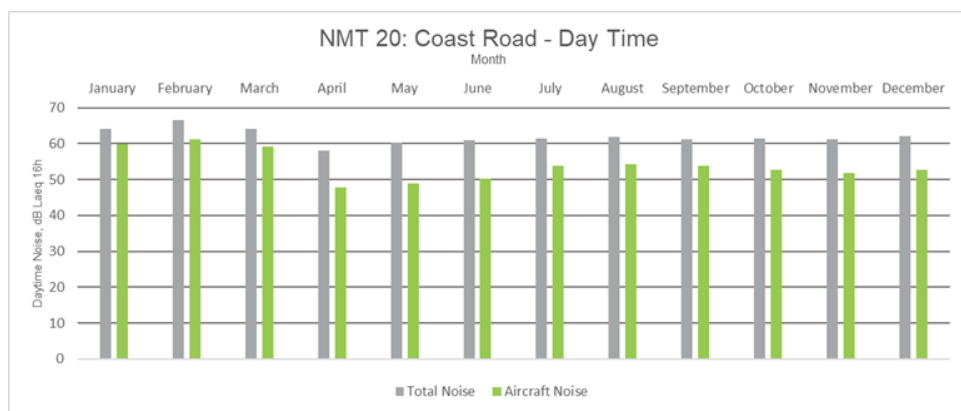


**Fig. 24 – NMT 20-day time noise**

*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.
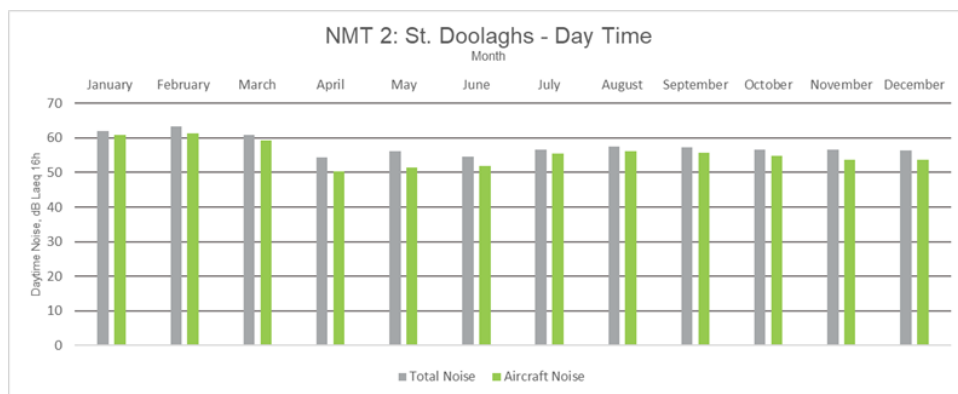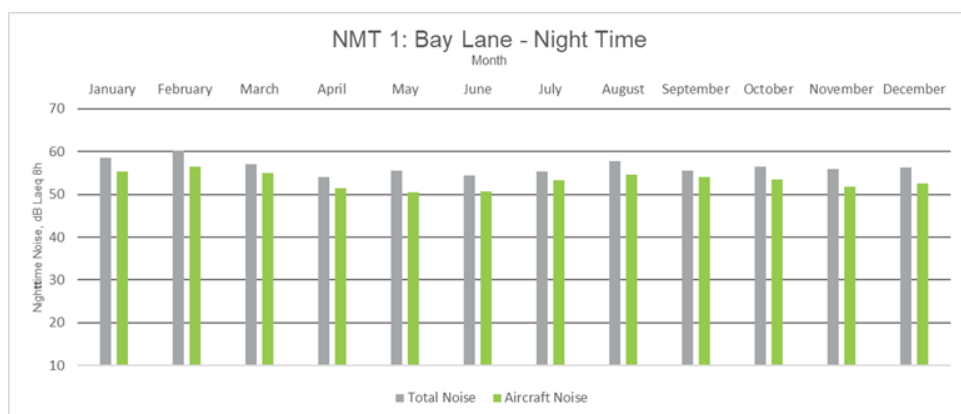


**Fig. 25 – NMT 1 night-time noise**
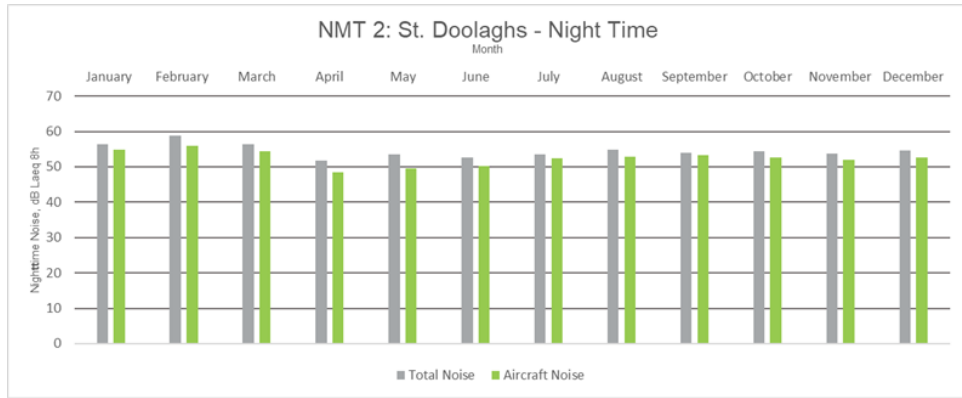
**Fig. 26 – NMT 2 night-time noise**
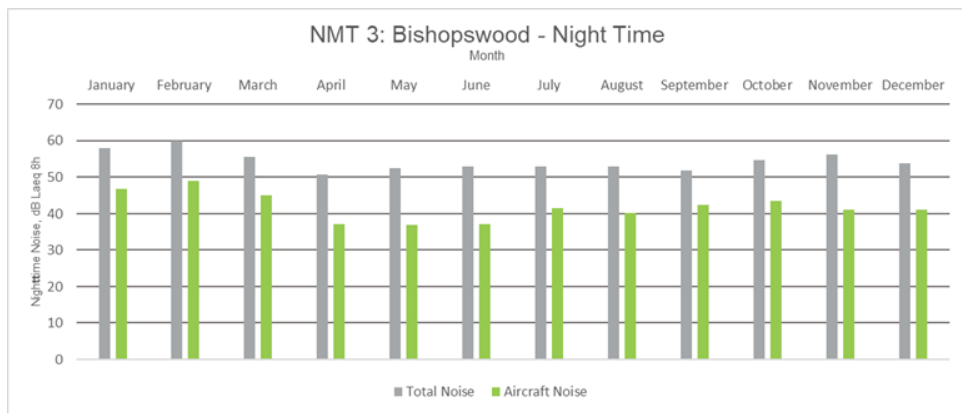


**Fig. 27 – NMT 3 night-time noise**
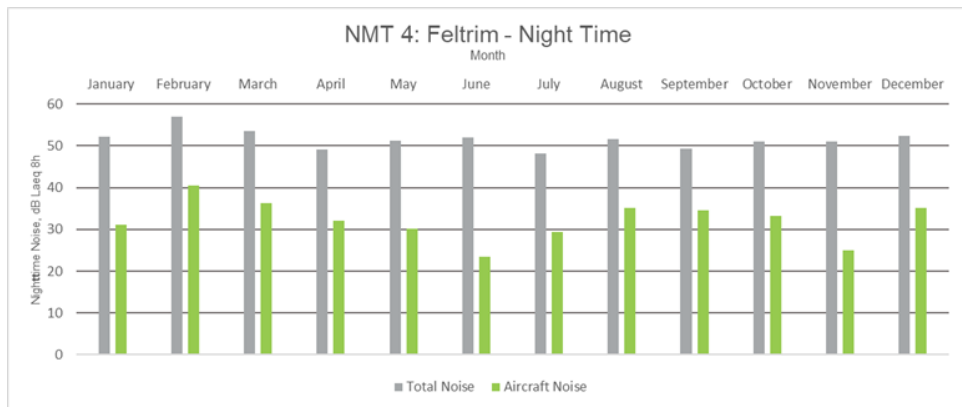


**Fig. 28 – NMT 4 night-time noise**
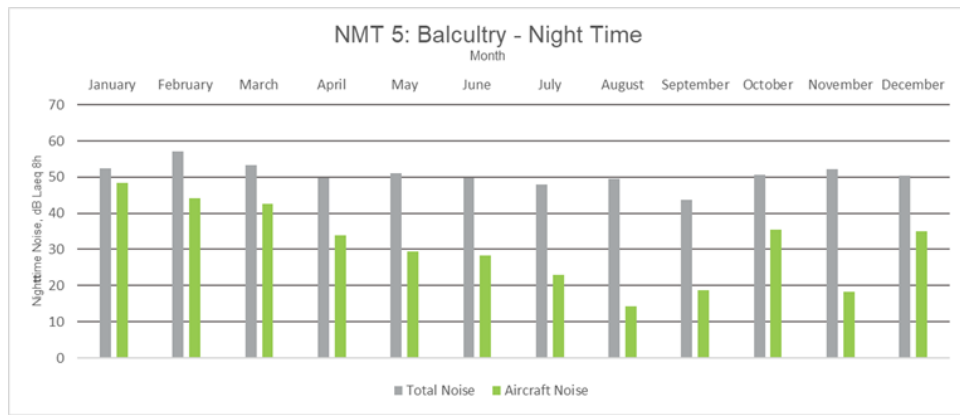
**Fig. 29 – NMT 5 night-time noise**
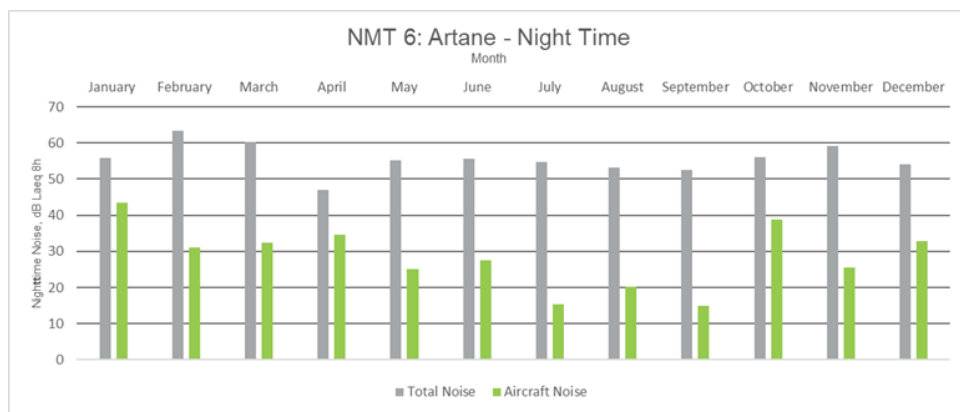


**Fig. 30 – NMT 6 night-time noise**
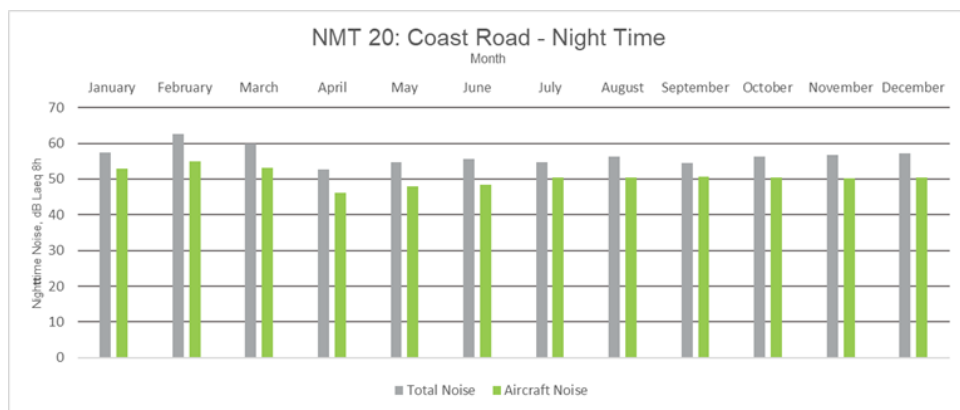


**Fig. 31 – NMT 20 night-time noise**

*LAmax noise levels per NMT*

The figures in this section show the $LA_{max}$ distribution for aircraft noise per NMT. $LA_{max}$ 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.
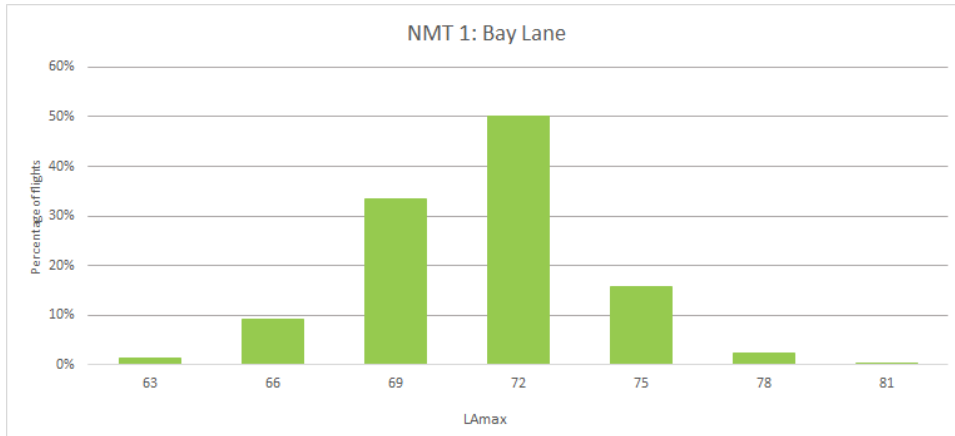
**Fig. 32– NMT 1 LA$_{max}$ noise**
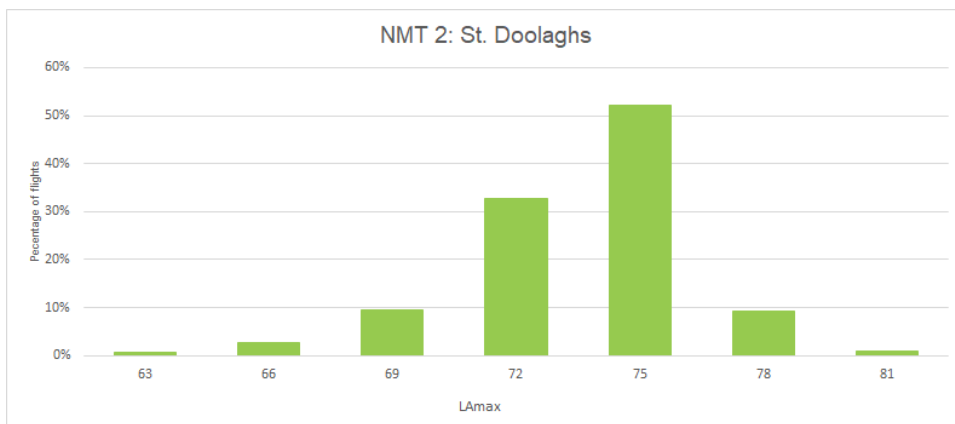


**Fig. 33– NMT 2 LA$_{max}$ noise**
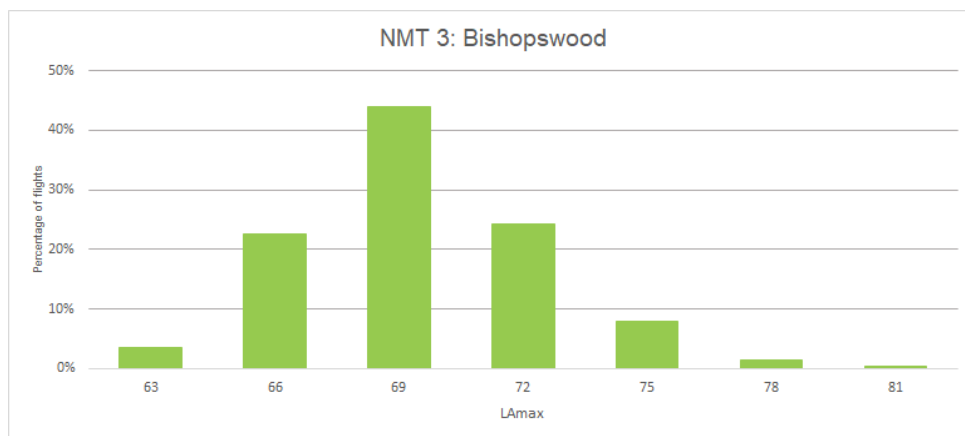


**Fig. 34– NMT 3 LA$_{max}$ noise**
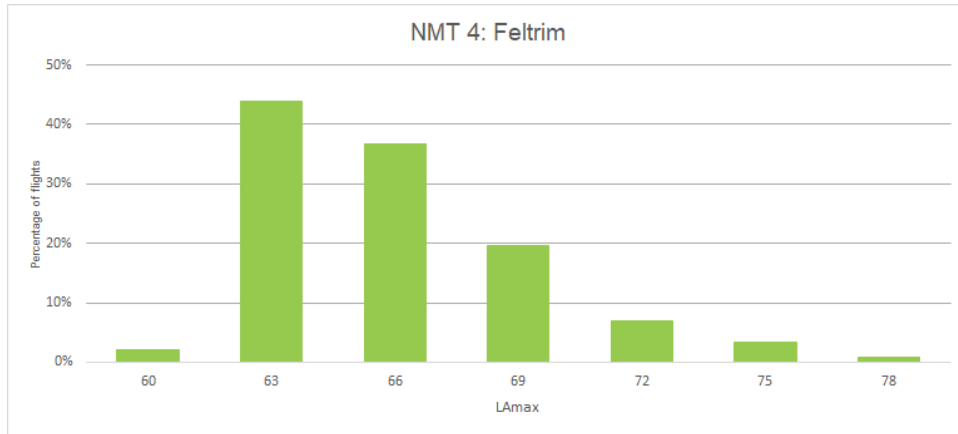
**Fig. 35– NMT 4 LA$_{max}$ noise**
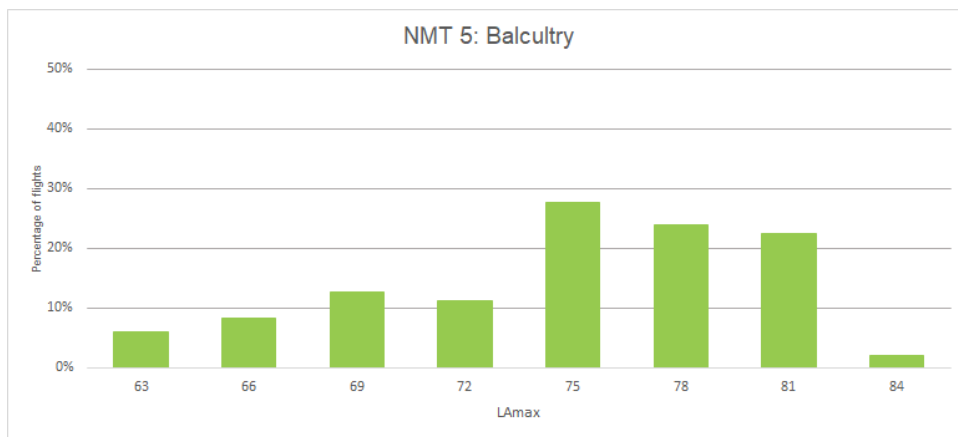


**Fig. 36– NMT 5 LA$_{max}$ noise**
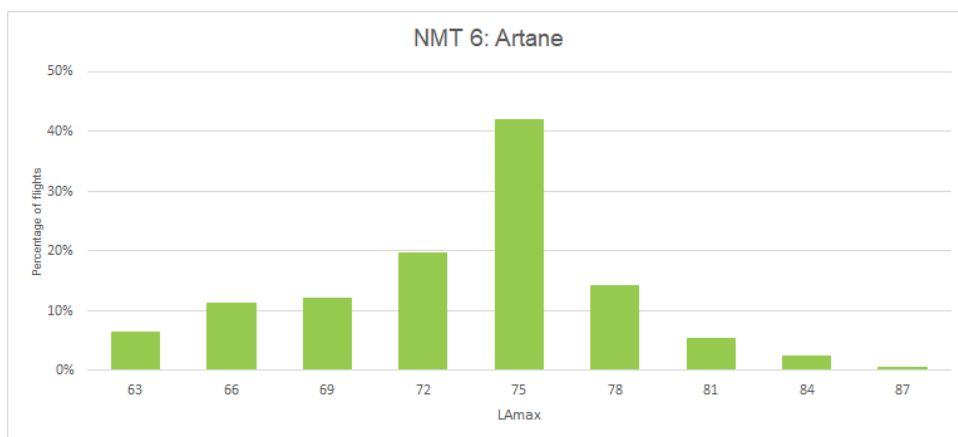


**Fig. 37– NMT 6 LA$_{max}$ noise**
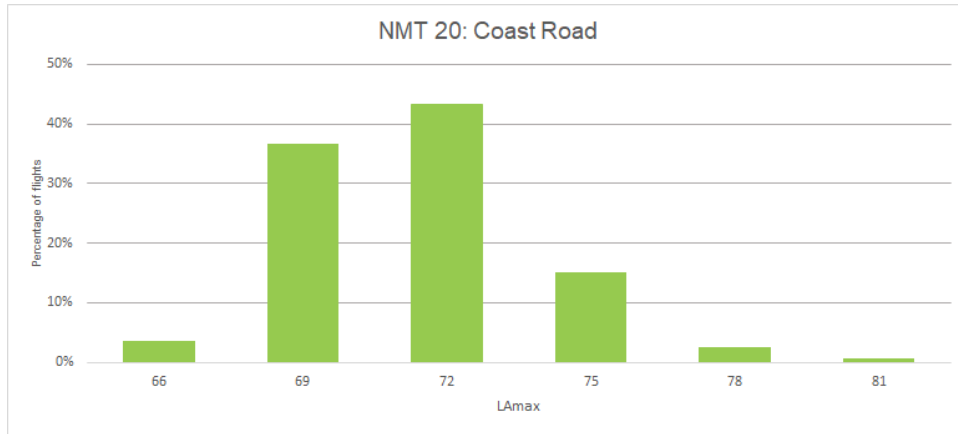
**Fig. 38 – NMT 20 LA<sub>max</sub> noise**

# 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 87192aircraft 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total** | **Total** | **8975** | **10.3** | **1324** | **1.5** | **75647** | **86.8** | **436** | **0.5** | **810** | **0.9** | **87192** |
| 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.
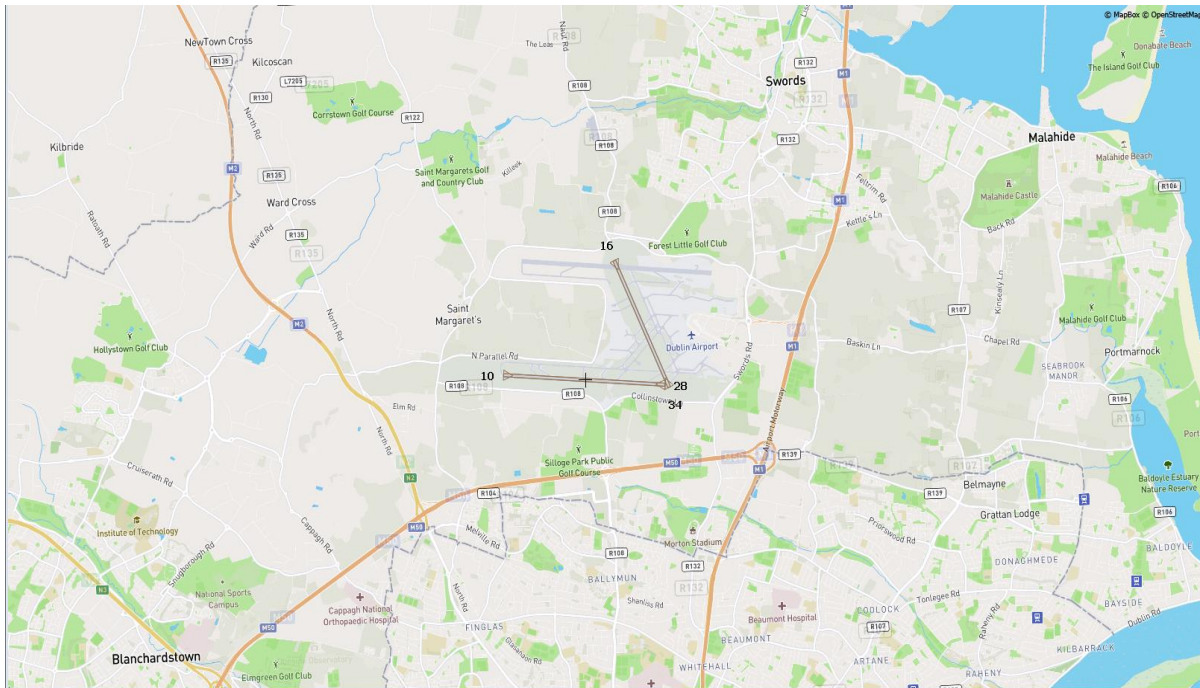
**Fig. 39– RWY layout**

| Runway designation | Arrivals only | Departures only | Total |
|:---:|:---:|:---:|:---:|
| 28 | 37889 | 37686 | 75575 |
| 10 | 4498 | 4455 | 8953 |
| 34 | 352 | 83 | 435 |
| 16 | 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 3rd 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.
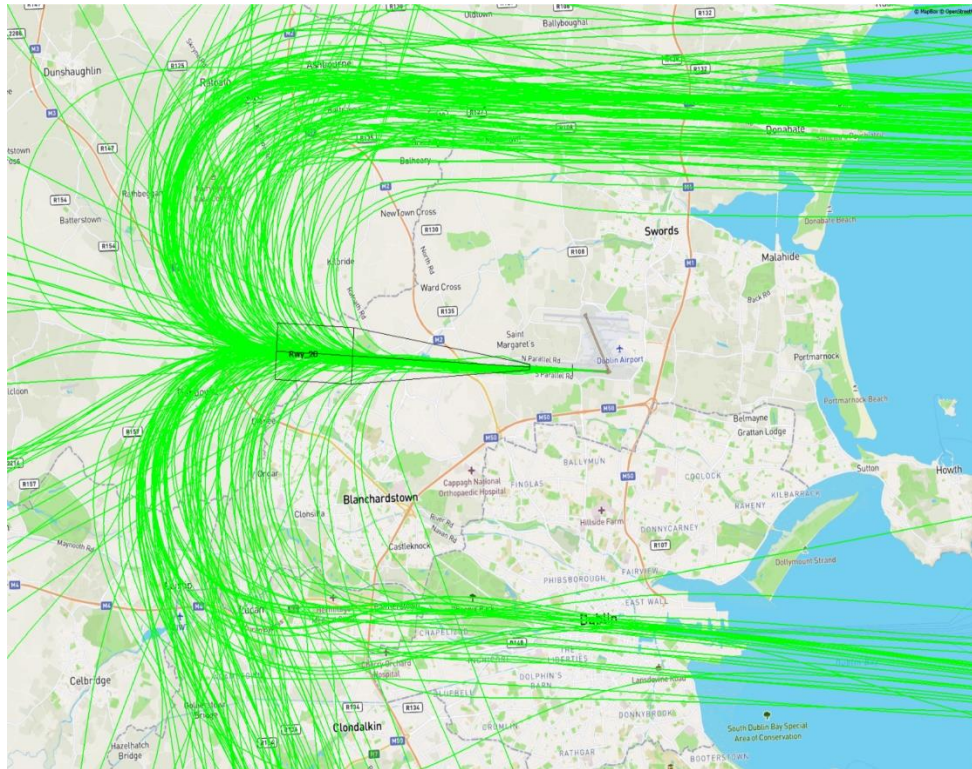
**Fig. 40: Tracks of category C/D departures on 3rd January 2020**
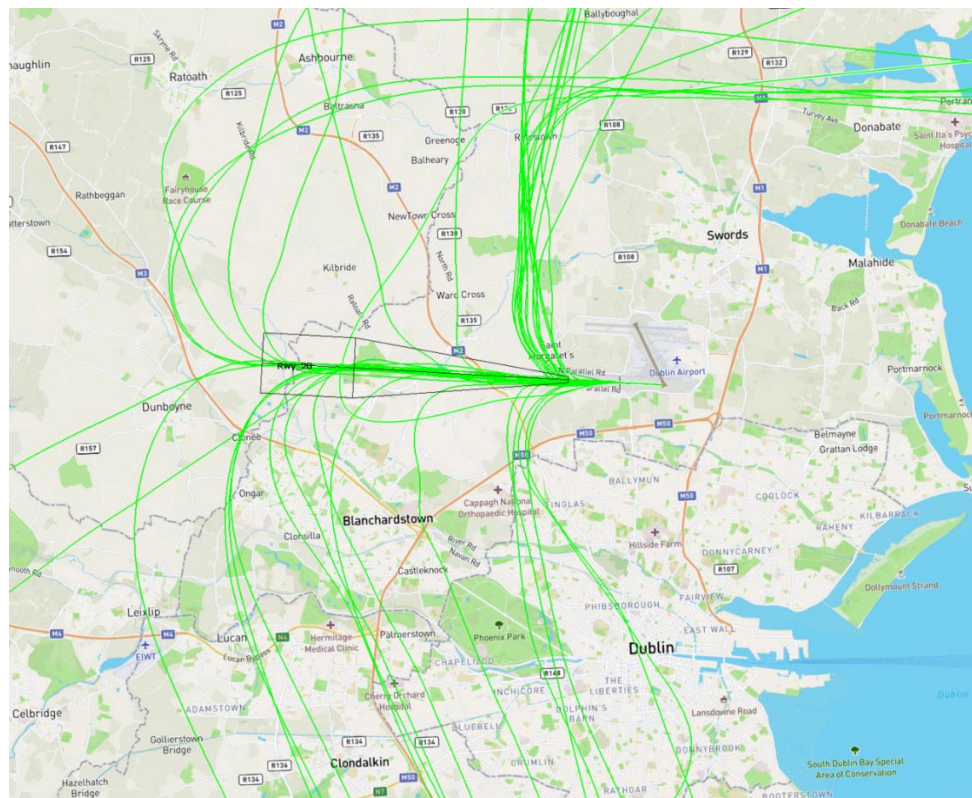


**Fig. 41: Tracks of category A/B departures on 3rd January 2020**
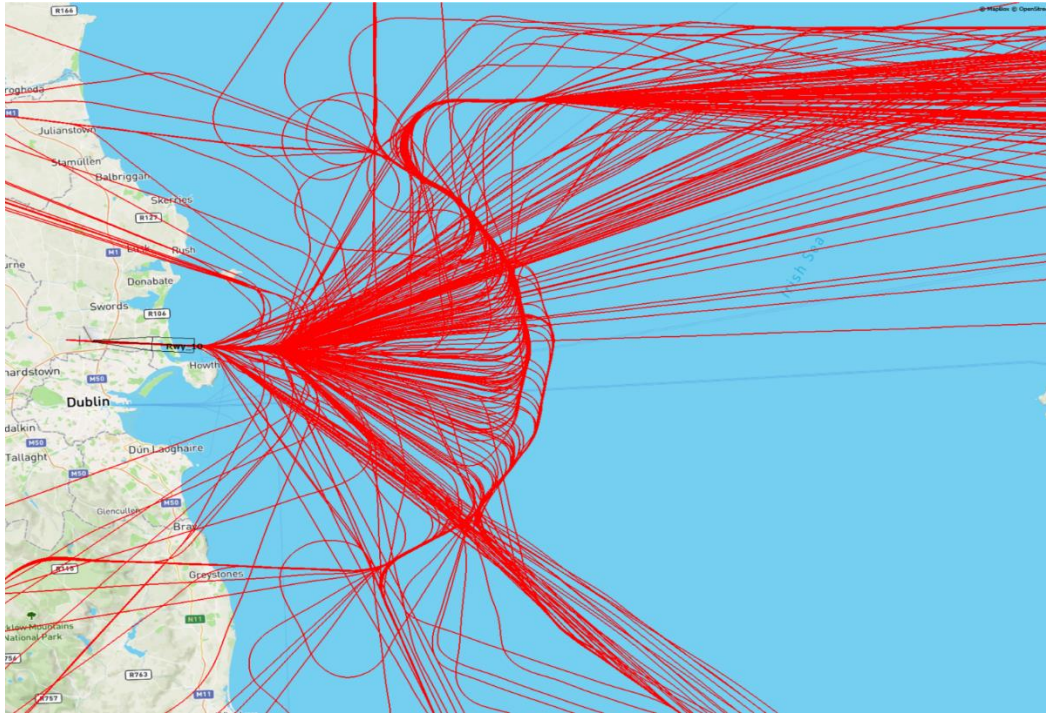
**Fig. 42: Tracks of category C/D arrivals on 3rd January 2020**
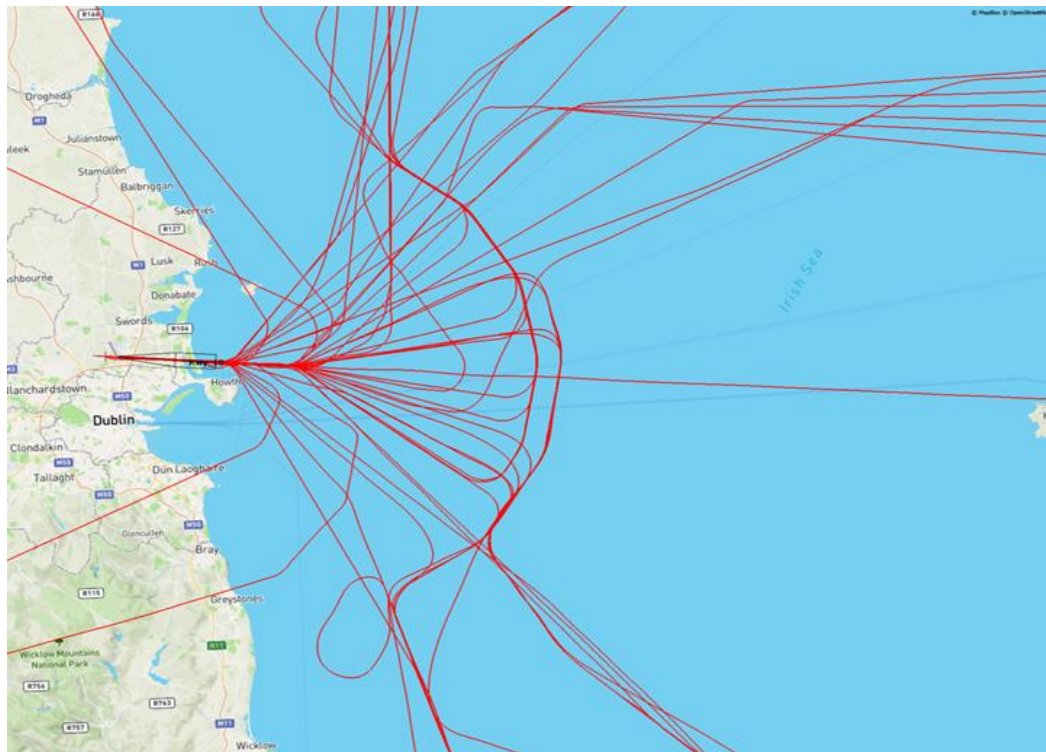


**Fig. 43: Tracks of category A/B arrivals on 3rd January 2020**

# 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 easement 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 appraised 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.
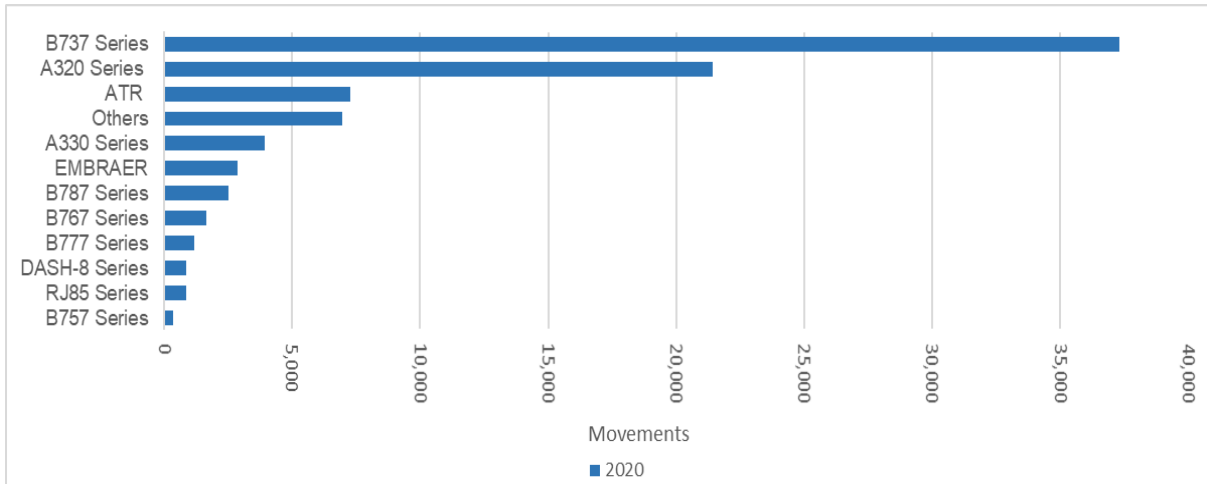


**Fig. 44: Aircraft type and fleet mix, 2020**
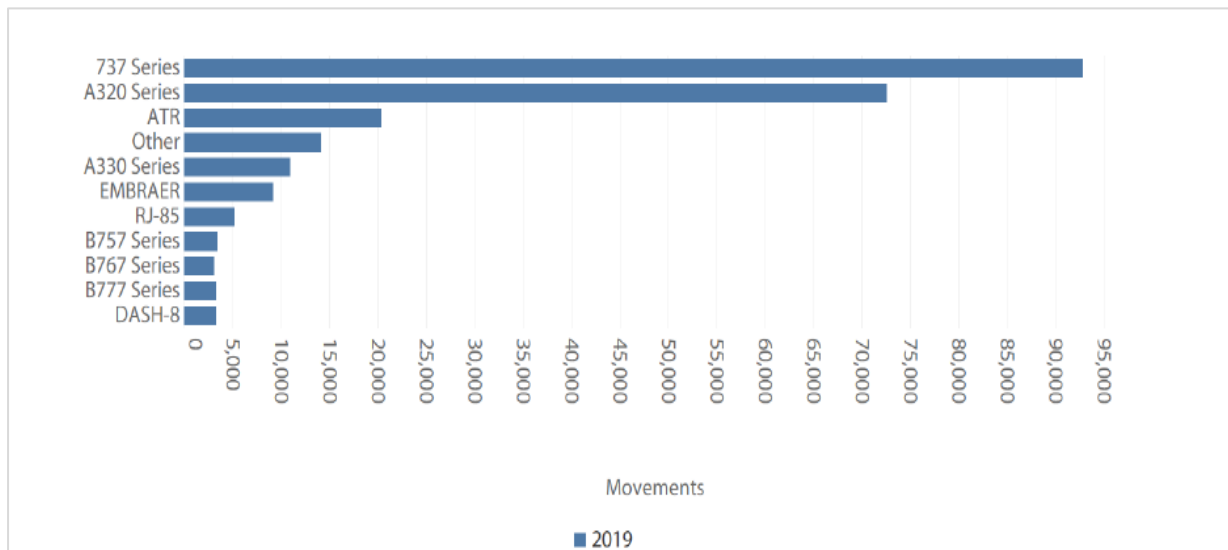


**Fig. 45: Aircraft type and fleet mix, 2019**

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 5 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 5 – Chapter Assessment of aircraft types at Dublin Airport**

# Compliance with Noise Mitigation Measures

Table 6 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 Compliance

### Reduction of Noise at Source

| Ref | Source | Description | Method of Monitoring/Systems – Method | System | Other Measure/Enforcement | Opinion on Compliance | Effectiveness/Performance |
|---|---|---|---|---|---|---|---|
| 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 is not currently 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 by Dublin Airport NFTMS team. | 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 – Method | System | Other Measure/Enforcement | Opinion on Compliance | Effectiveness/Performance |
|---|---|---|---|---|---|---|---|
| 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 madated in the AIP. | Compliant<br>2019: 98% usage RWY 10/28<br>2020: 98.6% RWY Usage 10/28 | The low level of Arrivals on Rwys 16, 28 and 34 respectively indicates close to minimum usage and adherence to operating procedure. The low level of Departures off Rwys 34,10 and 16 respectively indicates close to minimum usage and adherence to operating procedure. |
| 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 porcesses to escalate investigations to IAA-ANSP and relevant airport users as necessary. | Compliant<br>2019: 99.2% Track Keeping<br>2020: 99.14% | 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. |
| NA-3 | FCC NAP; daa NMP; AIP; | Noise Abatement Departure Procedures (NADP) Climb Profile - | Currently there is no known method or technology 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 will agree through DAOPG forum. 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 prevent positioning aircraft 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 | FCC NAP | Continuous Climb Operations / Continuous Decent Approach | Monitoring, tracking and performance measurement performed by the Performance Review Commission of EURCONTROL. | EUROCONTROL | Statutory monitoring and reporting via IAA-ANSP and EUROCONTROL. | Compliant<br>2019: CCO - 99.4% below FL105. CDO - 53.5% below FL75.<br>2020: CCO - 99.8% below FL105. CDO - 58.3% below FL75. | CCO % compliance indicates good perfromace. Relatively lower CDO % compliance indicative of air space and current procedures in place at Dublin Airport. |
| 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<br>2019: 96% compliance 20:00-07:00. 95.95% compliance 07:00-09:00 CAT C/D only<br>2020: 97% compliance 20:00-07:00. 98.25% compliance 07:00-09:00 CAT C/D only | Performance is adequate although can be improved. |
| 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 – Method | System | Other Measure/Enforcement | Opinion on Compliance | Effectiveness/Performance |
|---|---|---|---|---|---|---|---|
| LU-5 | FCC NAP; daa NMP; | Sound Insulation (RNIS) | Community Engagement Department, Communications Department | N/A | Condition 7 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 | Conditions 6 of An Bord Pleanala Planning Permission 2007 for 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 | Conditions 9 of An Bord Pleanala Planning Permission 2007 for NR. | Compliant | 6 eligible schools acoustically tested. 3 of the 4 qualifying schools have had or are in the process of having measures installed |

### Monitoring & Community Engagement

| Ref | Source | Description | Method of Monitoring/Systems – Method | System | Other Measure/Enforcement | Opinion on Compliance | Effectiveness/Performance |
|---|---|---|---|---|---|---|---|
| CE-1 | FCC NAP; daa NMP; | Stakeholder Engagement | Community Engagement Department, Communications Department | N/A | DAOPG/Scheduled Meetings | Compliant | DAOPG well established and attended. Noise Working Group to be considered |
| CE-2 | FCC NAP; daa NMP; | Community Engagement Programme | Community Engagement Department, Communications Department | N/A | Condition 28 of An Bord Pleanala Planning Permission 2007 for NR. | Compliant | DCLG, 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 in 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<br>2019: 15,160 Complaints / 15,160 Complaints processed / 15,157 responded to / 56 of 56 Complaints further investigated and closed<br>2020: 7,133 Complaints / 7,133 Complaints processed / 7,133 responded to / 39 of 96 Complaints further investigated and closed | Performance significantly disrupted by COVID pandemic. Manual nature of investigations and requirement for system access in both daa and IAA-ANSP not always possible through 2020. |

**Table 6 – Noise Mitigations Measure Compliance Table**

## Opportunities for Improvement

The noise mitigation measure compliance table detailed in Table 6 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.

| Opportunities for Improvement | | | | | | |
|---|---|---|---|---|---|---|
| OFI | Ref | Criteria/Policy | Opportunity For Improvement finding: | Consultation Requirement | Status: | Expected Implementation: |
| 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. 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.

# Glossary/Abbreviations

| | |
|---|---|
| A/B category aircraft aircraft, | Category of smaller aircraft, containing propeller aircraft, turboprop 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 Canadair | Large aircraft, such as Airbus and Boeing aircraft, Bombardier 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 |
| $LA_{Eq}$ | Equivalent average sound level |
| $LA_{max}$ | $LA_{max}$ is the maximum value that the A-weighted sound pressure level reaches during a measurement period |

| | |
|---|---|
| LAP | Local Area Plan |
| $L_{den}$ | $L_{den}$ is the weighted average of the yearly individual noise level during day, evening and night. |
| $L_{night}$ | $L_{night}$ 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 |
| 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 B - ICAO Chapter Compliance (Manufacturer MTOW)

Appendix C  -  NMT Dublin Noise Report