

# Annual Compliance Report

2022



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## Introduction

The Aircraft Noise (Dublin Airport) Regulation Act 2019, Part 4, Section 19 states that the airport sponsor 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 drafted a compliance report in accordance with the Act for calendar year 2022 (January 1 through December 31). The report includes those improvements required by the ANCA in correspondence received from 2020 through to 2022.

This report describes the roles and responsibilities of stakeholders and provides a non-technical summary of noise mitigation measures in place at the airport. The main report provides a detailed explanation of the following:

- community engagement
- complaint metrics
- noise contour maps
- performance of the noise monitoring terminals in place around the airport
- airport's 2022 operations, focusing on traffic management and distribution.
- operating restrictions in place at the airport
- flight operation procedures and assessment of the fleet mix
- airport's compliance with operating restrictions
- noise mitigation measures in place, with proposals to avoid or reduce failures of compliance.



## Key Roles and Responsibilities

### Dublin Airport

Per the Aircraft Noise (Dublin Airport) Regulation Act 2019, appropriate noise mitigation measures must be in place at Dublin Airport, and all airport users must comply with those measures.

### Noise and Flight Track Monitoring System Team

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

- Noise systems management (Airport Noise and Operations Monitoring System [ANOMS], WebTrak community engagement tool, and noise monitoring terminals)
- Flight-track keeping
- Complaint handling
- Regulatory and internal reporting of noise-related matters
- Submission of noise-related proposals to AirNav Ireland for the update of the *Aeronautical Information Publication* and related items
- Update of the relevant *Aerodrome Manual* directions related to noise mitigation measures.
- Support to relevant group sections for community engagement purposes

### Stakeholders

An airport user, including each airline, means a person responsible for the carriage of passengers, mail, or freight by air to or from the airport<sup>1</sup>. By operating into and out of Dublin, all airport users must comply with the information presented in the *Aeronautical Information Publication*.

Irish Aviation Authority – The IAA is the Irish national supervisory authority for civil aviation responsible for the regulation of safety, security and consumer interests.

AirNav Ireland – Previously known as the Air Navigation Service Provider, is responsible for the safe coordination of air traffic arriving to and departing from Dublin.

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

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<sup>1</sup> s.2 Aircraft Noise (Dublin Airport) Regulation Act 2019

## Non-Technical Summary

Following two years of COVID-19 disturbance, 2022 saw a strong rebound in international travel.

The global pandemic still dominated the news headlines at the beginning of 2022, and the Omicron variant was prevalent in Ireland in January and February; however, when the Irish government lifted all remaining travel restrictions in March, air traffic quickly returned at a much faster rate than had been predicted.

Dublin Airport accommodated more than 28.1 million passengers in 2022, representing a 231% increase from 2021 activity and an 85% recovery compared to 2019 levels. The revival in passenger numbers continued to accelerate as the year progressed, with passenger levels in the final three months of 2022 totalling 7.1 million – the equivalent of 96% of numbers in the same period of 2019.

The summer period of 16<sup>th</sup> June – 15<sup>th</sup> September saw 8.99 million passengers in 2022, compared to 2.74 million in 2021 and 10.1 million in 2019. This represents a 329% increase on 2021 and 10.7% decrease to 2019. In August, September, October, November, and December 2022, just over 13 million passengers travelled through Dublin Airport, which equates to almost half of the total traffic seen during the year; 26.5 million passengers either started or ended their journey through Dublin Airport, while 1.33 million passengers used the airport as a transfer hub last year. The number of people on domestic flights increased 237% compared to 2021 and increased 23% when compared with 2019.

When compared to 2021, short-haul traffic in 2022 increased by 216% to 23.9 million passengers, while long-haul passenger numbers increased by 366% to almost 4.2 million. This was a decrease of 19% when compared to 2019 passenger numbers for long-haul flights and a 14% decrease for short-haul flights.

During 2022, passenger numbers to and from Continental Europe reached 15.96 million, which is an increase of 198% compared to 2021 levels, and a decrease of 8% compared to 2019 levels. The number of passengers travelling between Dublin Airport and the UK was 7.8 million, which represents a decrease of 24% compared to 2019, but an increase of 257% compared to 2021. Additionally, transatlantic traffic increased by 383% compared to 2021, and for other international destinations, including flights to the Middle East, passenger numbers increased by 302% compared with 2021 numbers.

In 2022, Dublin Airport accommodated 211,282 aircraft movements (landing or take-off), which were recorded in the Airport Noise and Operations Monitoring System (ANOMS). This represented a 231% increase compared to 2021. The most common aircraft type was the Boeing 737-800 series aircraft (35.25%). 96.3% of aircraft using Dublin Airport in 2022 were aircraft of Chapter 4<sup>2</sup> classification or better, the quietest types as defined by the International Civil Aviation Organization.

The airport is licensed to operate 24 hours per day with night-time restrictions in place for the North Runway. In 2022 23.58% of movements took place between 23:00 and 07:00. Runway 10R/28L was operated as the primary runway, facilitating 97.97% of the movements between January and August and 32.13% of the movements between August and December, totalling 93.66% of overall movements for the year. The usage of the primary runway(s) is preferential in terms of noise impact, since its flight paths traverse less populated areas compared to Runway 16/34, whose flightpaths to the south are located over highly populated areas of the city of Dublin. Post opening of the North Runway, the use of 16/34 is only permitted in the most restricted of circumstances due to weather / wind or safety reasons as determined by AirNav Ireland Dublin Airport has several noise mitigations measures in place, such as the previously mentioned preferred runway usage, limitations on reverse thrust usage, departure procedures and Environmental Noise Corridors, and restrictions on engine test runs. Jet airliner aircraft (Category C/D) are required to fly within the Environmental Noise Corridors, which are based on the runway take-off flight path areas. In this report, compliance figures for the noise abatement operating procedures are provided where possible and referenced against the

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<sup>2</sup> Chapter 4 classification refers to aircraft type that meet the requirements of Chapter 4 of ICAO Annex 16, Volume I, 4

preceding year. Where monitoring and measurement of any operating procedure was not undertaken in 2022, specific narrative is provided to detail, where technically feasible and possible, the steps underway to ensure full compliance.

daa maintains and operates the Noise and Flight Track Monitoring System (NFTMS) that consisted initially of seven noise monitoring terminals (NMTs) up to mid-June 2022. Three additional NMTs were installed mid-year, increasing the total deployment to 10. The NMTs are installed in the vicinity of the airport, as directed by ANCA. The results from the system are used to report on noise levels around the airport and, where possible, to investigate flight-track keeping against the noise abatement operating procedures. In 2022 the NMTs were operational 99% of the time. The NMTs located directly under the flight paths of the southern Runway 10R/28L (NMTs 1, 2, and 20) recorded 276,614 noise events associated with aircraft. Accurate indication of the number of noise events associated with aircraft under the flight paths of Runway 10L/28R will require full deployment of additional NMTs, as directed by the Aircraft Noise Competent Authority (ANCA); however, interim results show NMTs 3, 4, and 5 recorded 40,912 noise events associated with aircraft, and this represents the most accurate figure available for 2022. Graphs of  $L_{Amax}^3$  noise levels are presented for each NMT in Section 1.6.6

For 2022, 87.76% of aircraft operated in accordance with flight-track-keeping rules (78,263 of 89,180 departures of Cat C/D aircraft). The flight-track-keeping rules are described in Section 1.0 and detail the Noise Preferential Routes (NPRs), otherwise known as Environmental Noise Corridors, upon which the performance metric is measured. daa keeps track of all breaches in the NFTMS. The NFTMS recorded 10,917 violations of the Environmental Noise Corridors by departing Category C/D aircraft, correlating to the 87.76% flight-track-keeping metric. Of the violations, 61.5% (6,716) were related to operations off Runway 28R between August 23 and December 31, 2022. Environmental Noise Corridors were not in place at this time; therefore, the figure presented is derived from the corridors completed for the standard instrument departure (SID) revision completed February 23, 2023. Correlation of the movements and generation of the violation metrics were retrospectively completed against flight-track records maintained with the NFTMS.

Because of the introduction of the north runway into a parallel runway system on August 24, 2022, a significant number of instrument flight procedure changes were completed throughout 2022, which are detailed in Section 4.0. Despite operational readiness and testing, the expected flight tracks did not fully reflect the anticipated and modelled outcomes. As such, preliminary Environmental Noise Corridors prepared to maintain flight-track performance measurement were inaccurate and had to be revisited across the remainder of 2022. Coupled with Information Technology transfer issues related to the pathname used to identify the route scheduled and undertaken by every flight off the north runway, the ability of the NFTMS team to complete appropriate noise flight-track keeping and complaint management was severely hindered. This is reflected in the complaint response metric of 83.8%, which has regrettably had a negative impact on the timeliness of responses. Retrospective application of Environmental Noise Corridors and the cleansing of data to allow pathname identification facilitated the generation of metrics, as provided in more detail in Sections 1.3 and 1.4.

Failure by airport users to comply with noise mitigation measures involves aircraft flying off track without being directed to do so by AirNav Ireland, therefore breaching the Environmental Noise Corridor. In 2022, 3,002 queries were sent to the AirNav Ireland, Air Traffic Service Unit (ATSU) for investigation; 75 of these referrals directly correlated to a complaint. The 3,002 violations issued to AirNav Ireland represent those violations for which an initial investigation by the NFTMS team could not identify the root cause. More detailed parameters and criteria outlining the determination for how and why a violation is issued to AirNav Ireland is provided in Section 1.6.

The Planning & Regulation department of daa also progressed the implementation of indicative environmental charges on invoices for airline partners. This builds on Phase 1 of the environmental charging

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<sup>3</sup>  $L_{Amax}$  Maximum sound level during measurement period

that proposed a framework for noise charges for implementation in 2021 and 2022. The application of a quota count system was used as the basis for the application of noise charges. Review of the indicative noise charging was required for input to the proposed airport charges decision paper scheduled for issue within 2023. Ongoing engagement with airport users and relevant regulatory bodies, such as the previously named Commission for Aviation Regulation (CAR), now IAA, and IAA-ANSP, now AirNav Ireland, and ANCA was maintained throughout 2022.

Section 5.0 describes aircraft movements by type compared to 2020 and 2021, as well as providing information on the International Civil Aviation Organisation (ICAO) chapter compliance. As indicated from the data, most aircraft at Dublin Airport are of the quietest types.

The noise contour maps completed for 2022 detail the modelled noise impact of aircraft operations for the various standard noise metrics, as well as compare the annual  $L_{den}$ <sup>4</sup> noise levels for 2020, 2021, and 2022. As expected, all the 2022 contours are larger than their 2021 equivalents. This is due to the removal of COVID-19 restrictions and the associated increase in movements in 2022 as passenger traffic returned.

NFTMS upgrades and improvements have largely focused on the expansion of the fixed and mobile noise monitoring network, with interim arrangements for localised temporary noise monitoring undertaken following requests by community groups. The expansion is expected to provide additional benefit throughout 2023 as the system is extended. Ongoing discussions with specialist service providers will allow continued improvement across several areas in 2023:

- WebTrak updated with Environmental Noise Corridor layer,
- Greater automation of complaint recording and tracking,
- Integration of additional fixed and mobile noise monitors into the NFTMS and WebTrak,
- Airport Directions review (Airport Directions form part of the overall *Aerodrome Manual* on how daa operates and manages the airport in line with all relevant regulations and statutory obligations),
- Implementation of environmental noise charges

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<sup>4</sup>  $L_{DEN}$  day-evening-night noise indicator meaning the noise indicator for overall annoyance across 24 hours.





1.0

# Noise Mitigation Measures at Dublin Airport





## 1.0 Noise Mitigation Measures at Dublin Airport

**Table 1** describes the noise mitigation measures at Dublin Airport. The mitigation measures align with the relevant elements of the International Civil Aviation Organisation's (ICAO) balanced approach elements.

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 Fly Quiet programmes.	FCC-NAP	Reduction of Noise at Source
3	NA-1	Two Runway Preferential Runway Programme	FCC NAP; daa NMP; AIP; Planning Condition 3(a-c), 4	Noise Abatement Operating Procedure
4	NA-2	Two Runway Noise Preferential Routes (NPR's) and Track Keeping	FCC NAP; daa NMP; AIP; Planning Condition 10	Noise Abatement Operating Procedure
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; Planning Condition 11	Noise Abatement Operating Procedure
10	NA-9	Monitor and Report	FCC NAP; daa NMP; Planning Condition 10	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, Planning Condition 9	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
18	PC-1	Runway 10L-28R shall not be used for take-off or landing between 2300 hours and 0700 hours	Planning Condition 3(d)	Planning Consent
19	PC-2	The average number of night time aircraft movements at the airport shall not exceed 65/night (between 2300 hours and 0700 hours) when measured over the 92 day modelling period	Planning Condition 5	Planning Consent

*Table 1 – Noise Mitigation Measures at Dublin Airport. \* NS-1 and NS-2 are noise mitigation objectives, as outlined in the Fingal County Council Noise Action Plan.*

Aircraft operators are instructed to ensure that, always, aircraft are operated in such a way as to cause the least disturbance practicable in areas surrounding the airport. The following subsections describe the specific noise abatement operating procedure measures.

## 1.1 Two-Runway Preferential Runway Programme / Parallel Runway Preferential Runway Programme

This noise mitigation measure sets out how, where possible, runways can be used to enable aircraft to avoid noise-sensitive areas during the initial departure and final approach phases of flight. With the opening of the north runway, a new concept of operations for parallel runway operations came into effect after August 24, 2022. This means that two separate concepts of operation were in place through 2022.

### 1.1.1 Period 1: January 1 through August 23, 2022

Prior to opening the new runway, the Two-Runway Preferential Runway Programme maintained Runway 10R or Runway 28L as the required runway on a 24-hour basis, when the crosswind component is 20 knots (KT) or less. Runway 28L would also be the preferential runway when the tailwind component is 10KT or less and braking action is assessed as good.

If the forecast crosswind component is greater than 20KT, then Runway 16 or Runway 34 would become the active runway. The use of Runway 16/34 shall be kept to an absolute minimum, subject to operational conditions and AirNav Ireland direction. Runways will be prioritised for noise abatement purposes between 23:00 and 07:00 local time, subject to the same wind calculation method and values as used between 07:00 and 23:00 local time.

### 1.1.2 Period 2: August 24 through December 31, 2022

With the opening of the new North Runway on August 24, 2022, the new “Parallel Runway” Preferred Runway Programme was implemented. Initially the North Runway was used only from 09:00 to 13:00 and later its use was extended until 18:00. Outside of these hours, including the night-time period, the South Runway continued to serve as the preferred runway.

During periods of Parallel Runway operations, as influenced by the North Runway Planning Permission, operations are “segregated” with one runway dedicated to departures and the other, to arrivals. During westerly segregated operations, Runway 28R is the preferred departure runway and Runway 28L is the preferred arrival runway. In easterly segregated operations, Runway 10R is the preferred departure runway and Runway 10L is the preferred arrival runway.

Runway 16/34 may only be used in adverse conditions, mainly crosswind conditions. When Runway 16/34 is the active runway, the north runway (10L/28R) is not available for arrivals or departures.

Generally, landing on Runway 28R is by exception only, and during the night-time period, Runway 10R/28L is the preferred runway, unless not available whereby the exemptions set out in Condition 3 of the North Runway planning permission can apply.

## 1.2 Two-Runway Noise Preferential Routes and Flight-Track Keeping

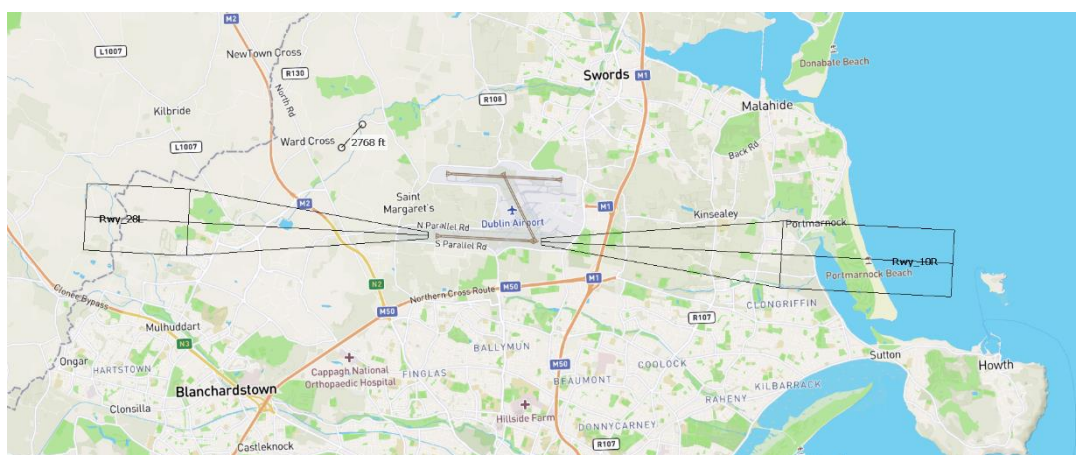
Unless directed otherwise by AirNav Ireland, all Category C/D aircraft departing from Dublin Airport will follow specific Noise Preferential Routes (NPRs), also known as Environmental Noise Corridors. The NPRs are designed to avoid and mitigate overflight of built-up areas. The centreline of the NPR is based the Standard Instrument Departure (SID).

The NPRs were prepared and inserted into the Dublin Airport Noise and Flight Track Monitoring System (NFTMS) to provide appropriate and proportional compliance monitoring of flights departing off all runways. The necessity to complete noise flight-track monitoring and provide performance metrics is a noise mitigation measure that must be reported under the Dublin Airport Noise Act to the Aircraft Noise Competent Authority (ANCA).

Aircraft flying inside the NPRs are deemed to be flying on-track. Once an aircraft reaches the end of the relevant NPR or is at an appropriate altitude for the relevant runway (3,000 feet [ft] for the southern and crosswind runways and 4,000ft for the north runway), any aircraft may be vectored by AirNav Ireland onto a more direct heading to its destination. Safety and environmental considerations may dictate that AirNav Ireland turn aircraft off NPRs below 3,000ft or 4,000ft. Also, unless otherwise directed, aircraft must not leave their respective NPR below the applicable altitude.

The minimum turn distance is 5 nautical miles (NM) while using Runways 28L, 16, and 34. Departures from Runways 10R and 10L must track the runway extended centreline to 5NM before commencing the turn to the north, or to 6NM before commencing the turn to the south. Departures from Runways 10R and 10L may be vectored by AirNav Ireland once above the required altitude. The NPRs do not apply to Category A/B aircraft (light aircraft, turboprop).

The Southern Runway NPRs, shown on **Figure 1**, have a width of 180 metres (m) at the departure end of the clearway, diverging at 12.5% on each side to a maximum width of 1,800 metres (m).



*Figure 1 – Southern Runway Noise Preferential Routes*

As shown on **Figure 2**, the Northern Runway NPRs have a width of 240m commencing at a point 2,000m from the nominal start of roll point. The 28R NPR diverges at 12.5% on the southern side and 30% on the northern side to a maximum width of 1,800m to align with the safety-driven divergence requirements. The NPRs track the respective standard instrument departure (SID) centreline and extend to a point corresponding to a vertical height of 4,000ft. Four unique NPRs are in place off Runway 28R:

- BOFUM\_LIFFY\_ENDQ
- Corridor Six
- NEVRI\_ROTTEV
- SUROX

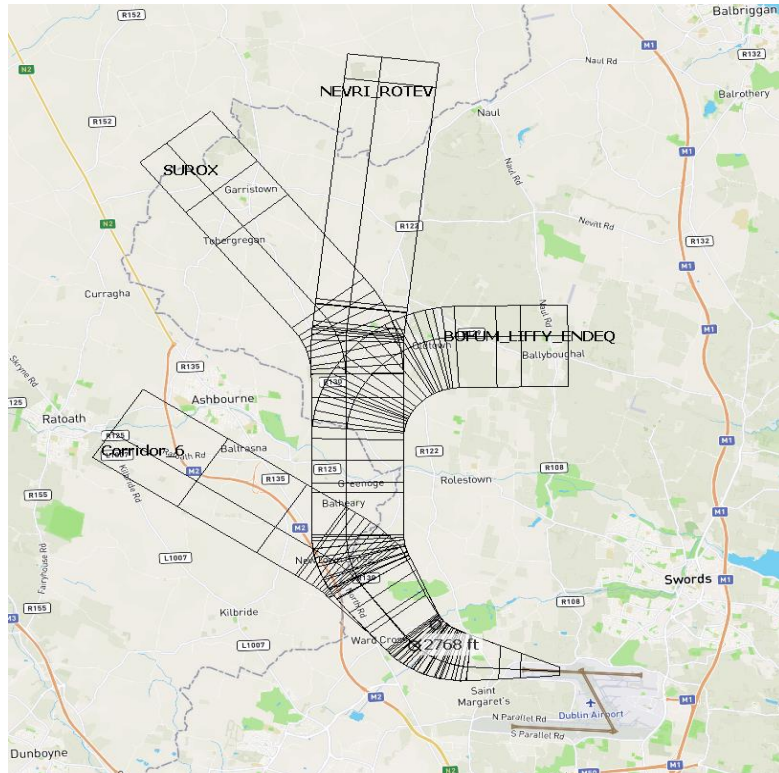


Figure 2 – Runway 28R Noise Preferential Routes

**Figure 3** shows the NPR in place for departures off Runway 10L. The 10L NPR has a width of 240m commencing at a point 2,000m from the nominal start of roll point. As specified by the safety-driven divergence requirements, the 28R “centreline” is offset by 10 degrees to the north from the Departure End of Runway (DER) and thereafter the width of the NPR diverges at 12.5% to a maximum width of 1.8km. The NPR tracks the respective standard instrument departure (SID) centreline and extends to a point corresponding to a vertical height of 4,000ft.



Figure 3 – Runway 10L Noise Preferential Routes



For reference, the width of the northern runway corridors at 1,800m aligns broadly with the area navigation (RNAV) airspace design specification requiring aircraft operation within 0.5NM of centreline.

### 1.2.1 Noise Abatement Departure Procedure Climb Profile

Noise abatement departure procedure (NADP) climb profiles are operating procedures that identify rates of climb to a standard speed. The procedures are intended to be beneficial 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.

### 1.2.2 Visual Approach Jet Aircraft

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

### 1.2.3 Continuous Climb Operations / Continuous Descent Operations

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

Continuous descent operations (CDOs) 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.

### 1.2.4 Reverse Thrust

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

### 1.2.5 Engine Ground Running

Engine test runs are a normal part of operations at Dublin Airport. Engine test runs must be carried out after heavy maintenance on an aircraft to comply with international safety regulations. Strict conditions govern high-powered engine test runs that take place at the airport. While technological advances in aircraft engine design mean that modern aircraft have a lower noise impact than older aircraft, noise impacts still exist; therefore, there are strict controls for when engine test runs may be undertaken.

Engine test runs are not permitted between 20:00 and 07:00. All aircraft types may undertake testing between 09:00 and 20:00, and only aircraft up to Category C may undertake engine testing between 07:00 and 09:00, per the requirement within *Aerodrome Manual, Direction 6.10*, and mandated within the *Aeronautical Information Publication (AIP)*.

### 1.2.6 Monitor and Report

Strict compliance with SID is mandatory and is monitored by measuring compliance with the Environmental Noise Corridor.

Large aircraft (Category C/D) are required to fly within the Environmental Noise Corridor that is based on the runway take-off flight path areas. Figures 1, 2 and 3 provide an overview of these corridors. The corridors have a width of 180m 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 10R, must track the runway extended centreline after take-off to 5NM before commencing the turn, unless otherwise cleared by Air Traffic Control (ATC) 3,000ft above mean sea level (AMSL). Departures from Runway 10R must track the runway extended centreline to 5NM before commencing the turn to the north, or to 6NM before commencing the turn to the south. For departures from Runway 10R, 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 Noise Corridors do not apply to Category A/B aircraft (light aircraft, turboprop-type aircraft).

### 1.3 Complaint Metrics

In 2022, 885 people complained about 32,646 aircraft noise events, as shown in **Table 2**. This represents a 239% increase in complaints and a 463% increase in individuals compared to 2021, when 191 people lodged 13,613 complaints. In 2022, one complainant was responsible for logging 25,126 complaints, which was 77% of the total complaints received. Most complaints received related to Runways 28L and 28R.

Description	2020	2021	2022	Note
Complaints	7,133	13,613*	32,646	239% increase 2022 versus 2021 (movement increase of 231% across 2021/2022)
Complaint responses acknowledged/issued	7,133	13,577	27,371	TBC
Referred to AirNav Ireland	96	29	75	
Violations that were subject of complaint not issued to AirNav Ireland	N/A	7	0	Validation of complaint process identified and under review
AirNav Ireland further investigation completed	39*	12	0	
AirNav Ireland investigation to complainant	N/A	1	0	

Table 2 – Number of Complaints

**Figure 4** shows the Category C/D on-track performance based on the total number of violations for 2022. **Figure 5** depicts the noise complaint analysis by runway, and **Figure 6** compares the number of complaints for the daytime and night-time hours.

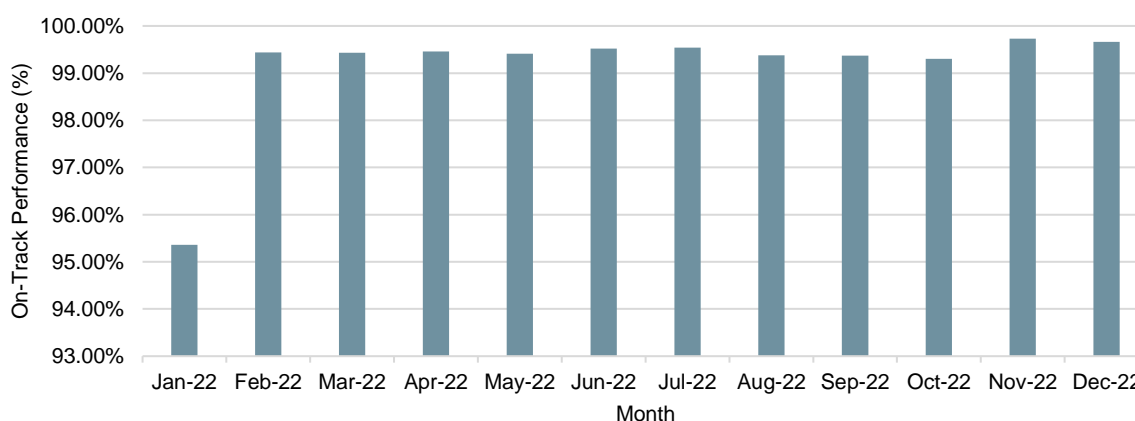


Figure 4 – Category C/D Aircraft On-Track Performance 2022



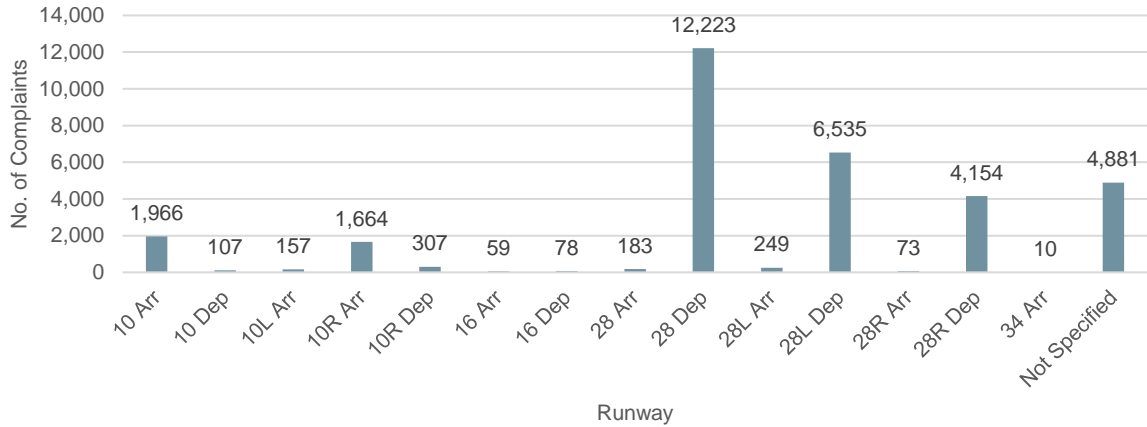


Figure 5 – Noise Complaint Analysis by Runway 2022

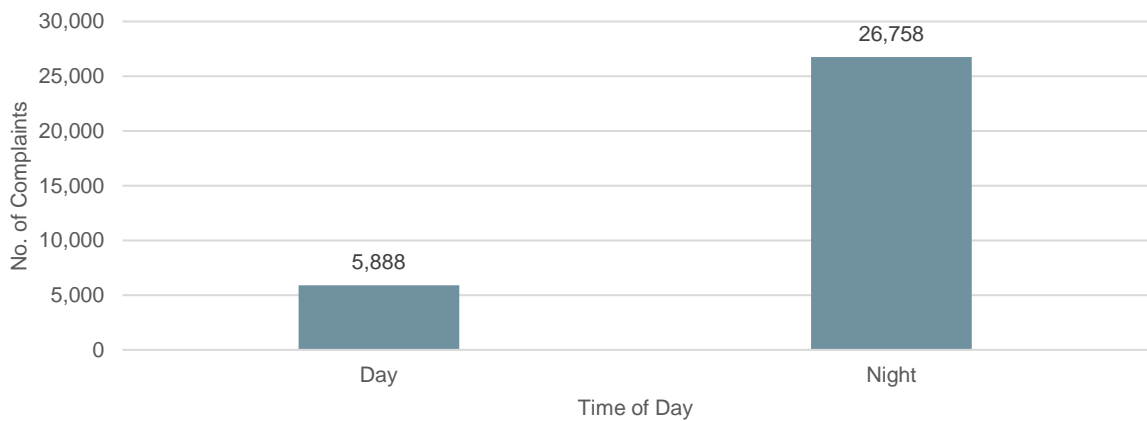


Figure 6 – Day/Night Noise Complaints 2022

**Figure 7** depicts the overall noise complaint analysis for 2022, and **Figure 8** shows 112 instances of when a complaint corresponded with the violation of an Environmental Noise Corridor outside the Dublin Airport land boundary. Overall, 75 of these 112 complaints were forwarded to AirNav Ireland for further investigation. The remaining 37 complaints are marginal violations of the Environmental Noise Corridors that can be accounted for by system tolerance levels or weather conditions.

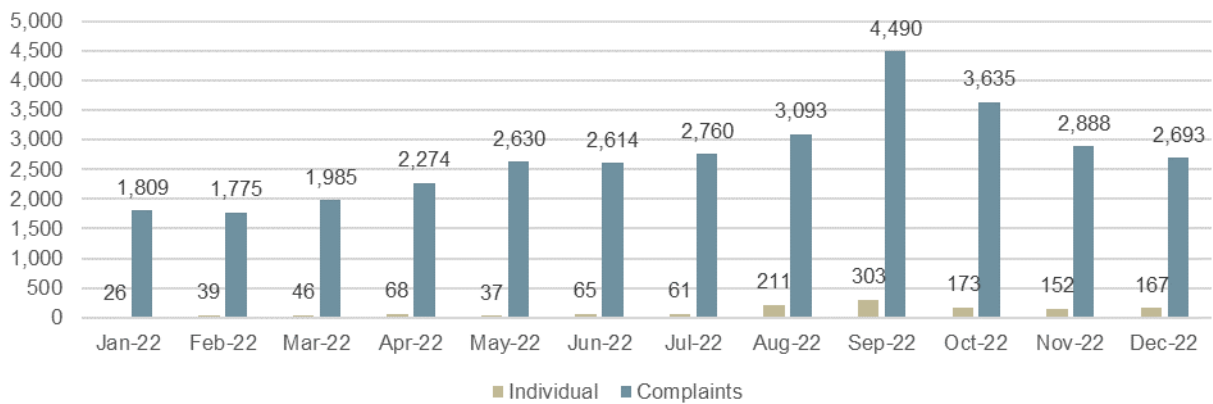


Figure 7 – Noise Complaint Analysis 2022

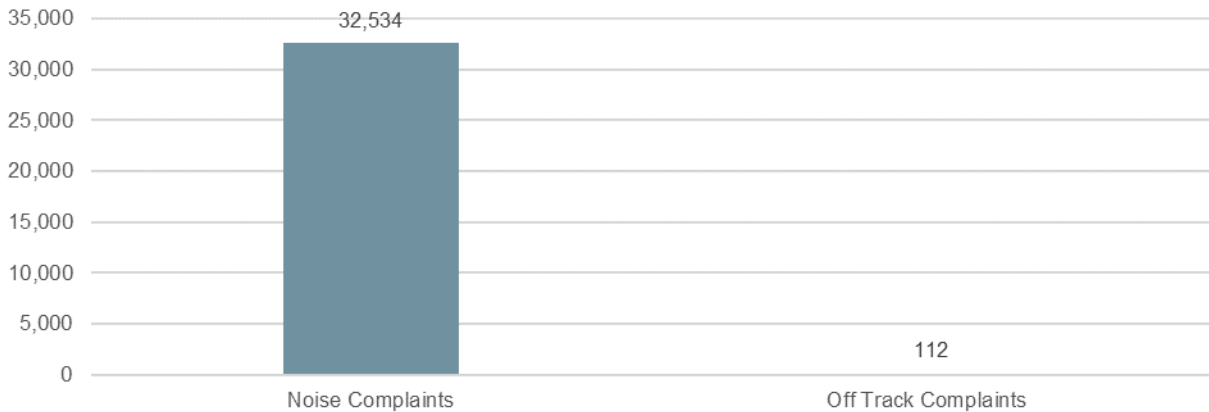


Figure 8 – Noise Complaints Versus Off-Track Complaints 2022

## 1.4 Violations Insights

Figure 11 shows the movement counts by hour, and Figure 12 depicts the count of Category C/D violations by hour.

Flight-track-keeping violations refer to breaches of the Environmental Noise Corridors and relevant other rules, as identified in the AIP and described in the non-technical summary. Note that all violations, regardless of whether occurring within the daa land boundary or otherwise, are represented on the figures.

CCO and continuous descent approach (CDA) procedures are under AirNav Ireland control and are monitored by EUROCONTROL. Appendix C provides a graphical representation of CDA violations for indicative purposes. The introduction of appropriate rules within the Dublin Airport monitoring systems has allowed the measurement of such procedures but requires further discussion with AirNav Ireland to ensure accuracy relevant to specific details.

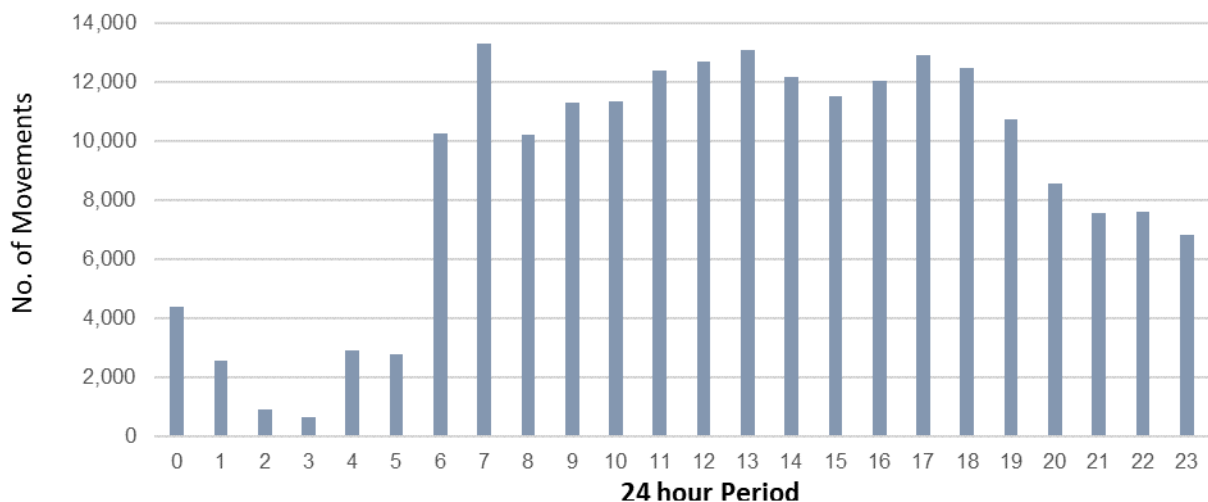


Figure 11 – Movements by Hour (24-hour period, 0 = 00:00, 23 = 23:00)

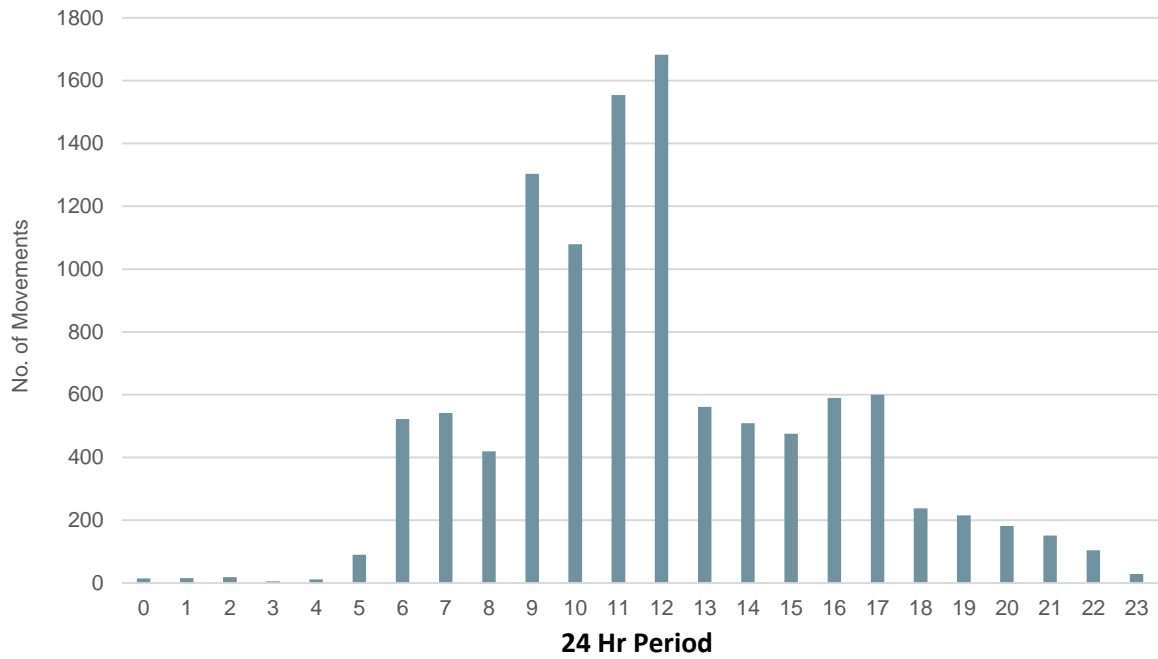


Figure 12 – Count of Category C/D Violations by Hour (24-hour period, 0 = 00:00, 23= 23:00)

The alignment of violations by hour with the first wave of departures from Dublin Airport is consistent with the movements per hour shown on Figure 11 and further depicted by the time-of-day graph on **Figure 13**.

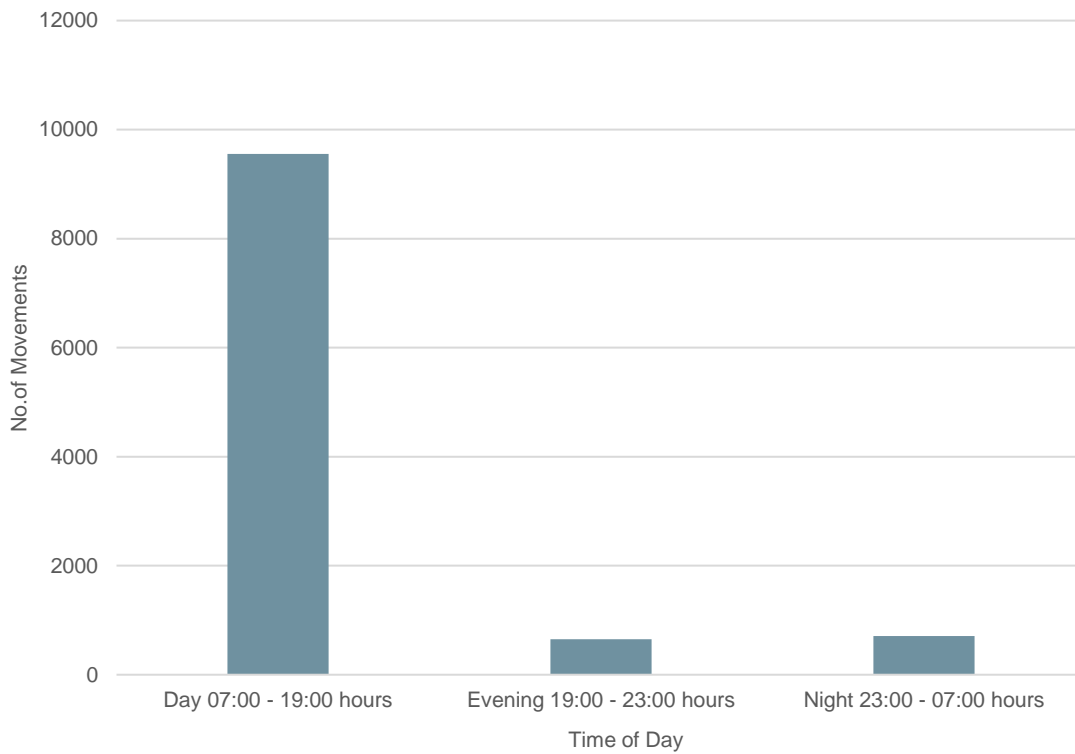


Figure 13 – Count of Category C/D Violations by Time of Day

While the information provided is not unexpected, it does highlight the importance of early morning operations for airport users, as well as an area for further engagement and improvement. As **Figures 16** and **17** show, most violations are correlated with the aircraft operated by the largest carriers based at Dublin Airport, and when viewed in conjunction with **Figure 14**, the prevalence of flight-track-keeping anomalies for the first wave of departures is readily apparent.

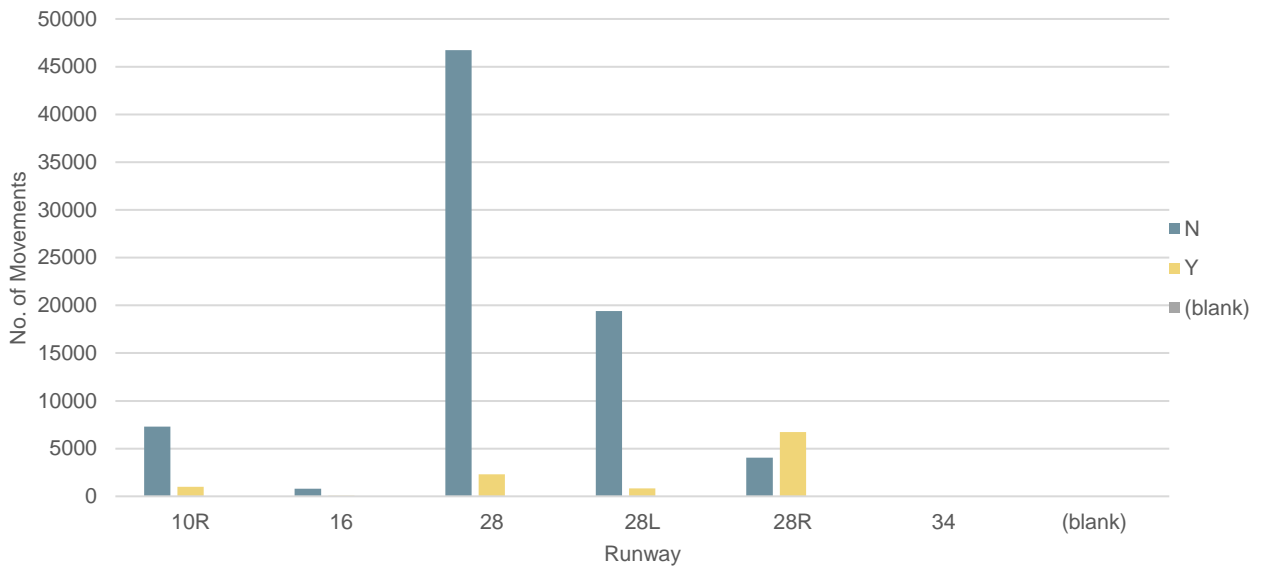


Figure 14 – Departure Flight-Track Keeping 2022 by Runway. “N” represents no violation of the Environmental Noise Corridor

**Figure 15** and **Table 3** provide additional insight into the compliance by month for each Runway.

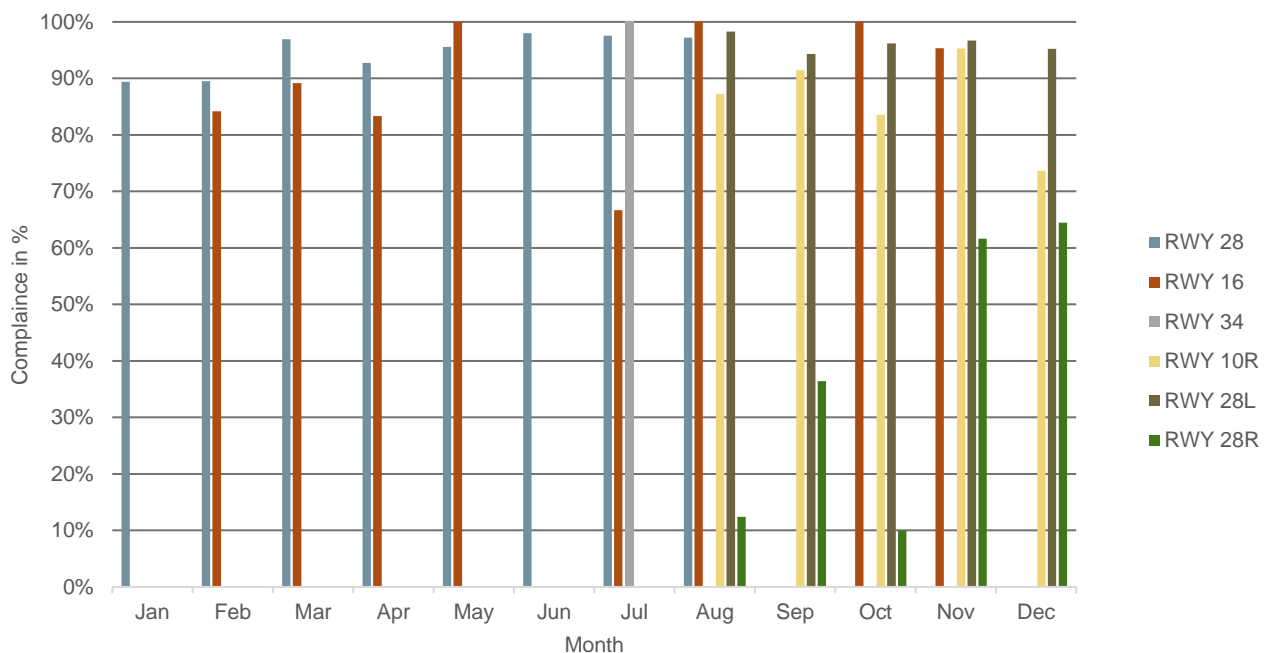


Figure 15 – Monthly Runway Flight Track Compliance

Month	RWY 28	RWY 16	RWY 34	RWY 10R	RWY 28L	RWY 28R	RWY 10L
Jan	89.42%						-
Feb	89.50%	84.21%					-
Mar	96.94%	89.17%					-
Apr	92.74%	83.33%					-
May	95.58%	100.00%					-
Jun	97.98%						-
Jul	97.58%	66.67%	100.00%				-
Aug	97.23%	100.00%		87.27%	98.26%	12.37%	-
Sep				91.41%	94.31%	36.40%	-
Oct		100.00%		83.57%	96.22%	9.94%	-
Nov		95.35%		95.29%	96.73%	61.64%	-
Dec				73.65%	95.23%	64.45%	-

Table 3 – Monthly Runway Flight Track Compliance (%)

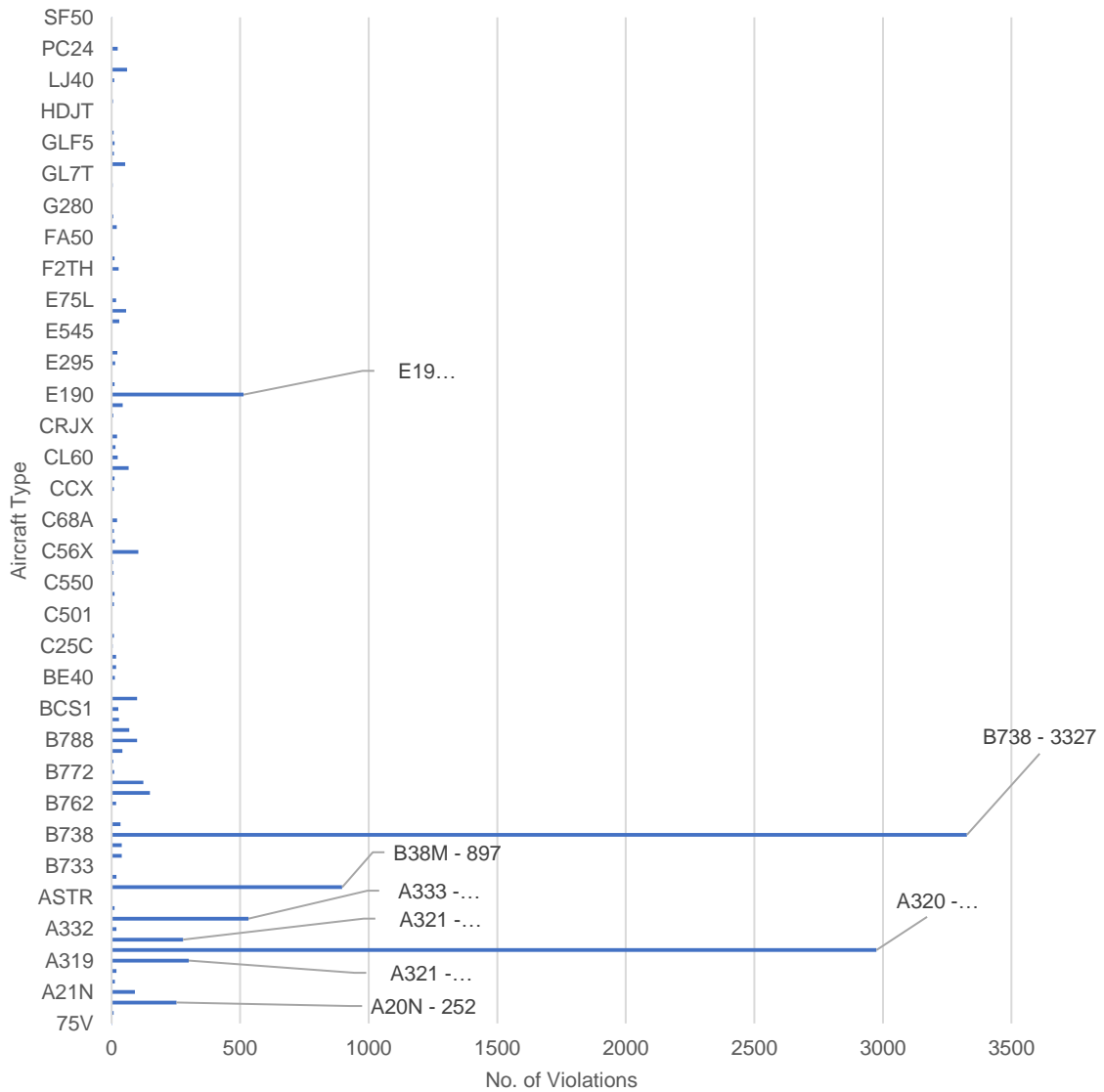


Figure 16 – Count of Category C/D Violations by Aircraft Type

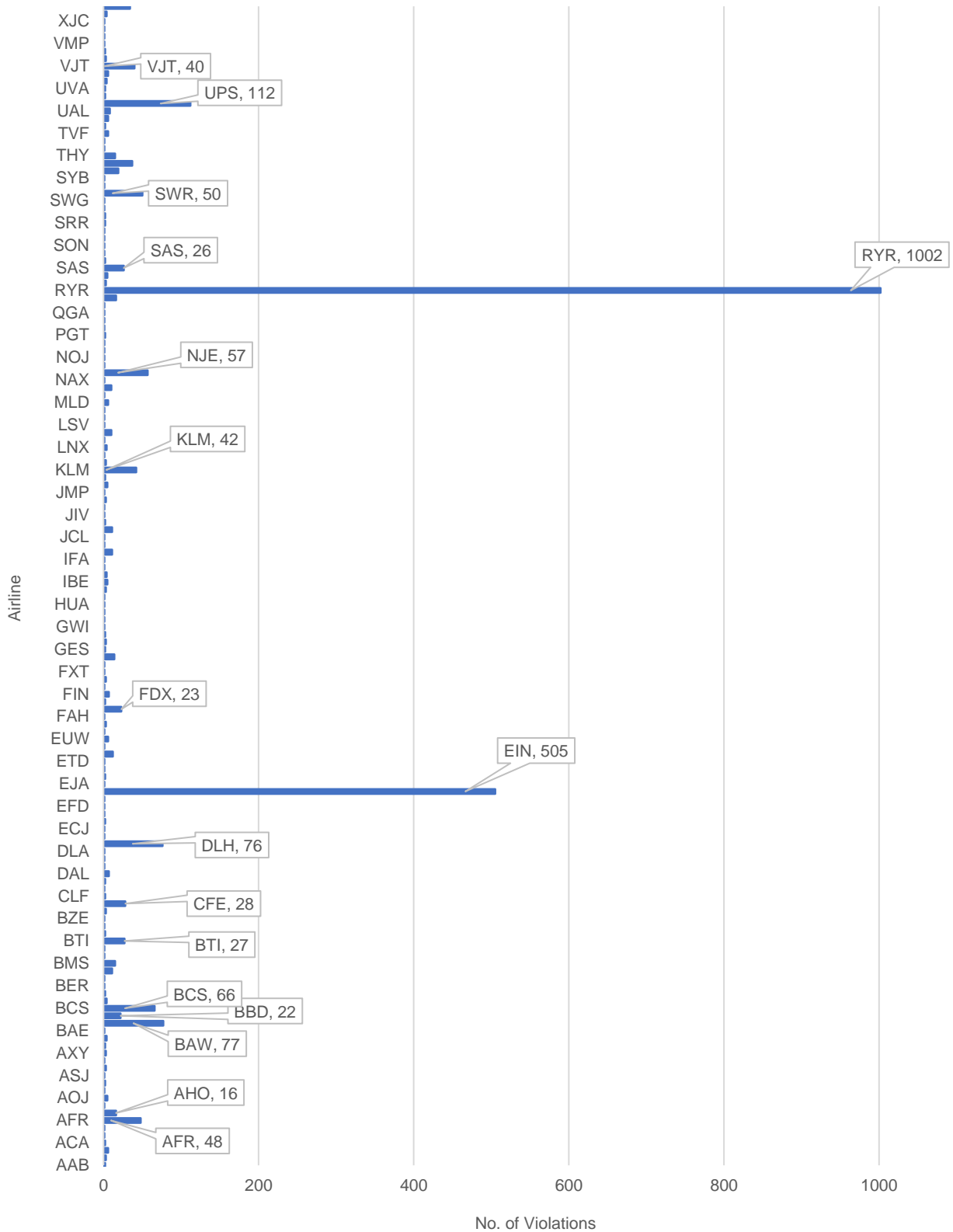
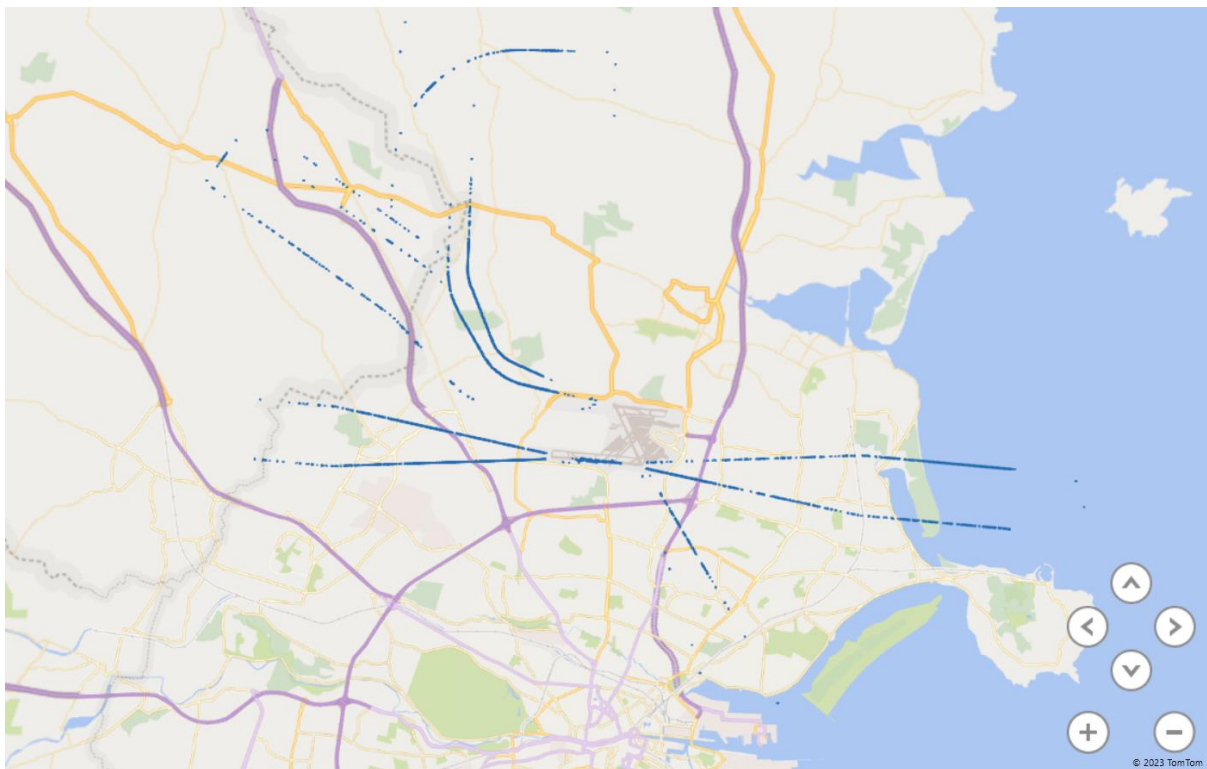


Figure 17 – Count of Category C/D Violations by Airline

daa is committed to improving airline performance management and has maintained noise as a standing item at the Dublin Airport Operations Planning Group (DAOPG) meeting held with all relevant airport users. Specifically, the topics of improved flight track keeping, CCOs, CDOs and adherence to the Environmental Noise Corridor are discussed. Ongoing working group discussions with both the AirNav Ireland and the airlines operating at the airport are conducted to improve adherence and develop reporting programmes for the noise abatement procedures.

**Figure 18** shows the location of identified violations. Each blue dot represents the point at which a corridor violation occurred with Category C/D aircraft. It is worth noting that most of the violations occur within the land boundary of the airport and merge 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, but they are not issued to AirNav Ireland for further investigation or included in the reported complaint statistics, as described in Section 8.

**Figures 19** through **31** show violations by runway and time of day. The aircraft tracks with elevation colours provides additional insight into the violations. Daytime refers to the period 07:00 – 19:00, evening is 19:00 – 23:00 and night-time is 23:00 – 07:00.



*Figure 18 – Locations of Violations*



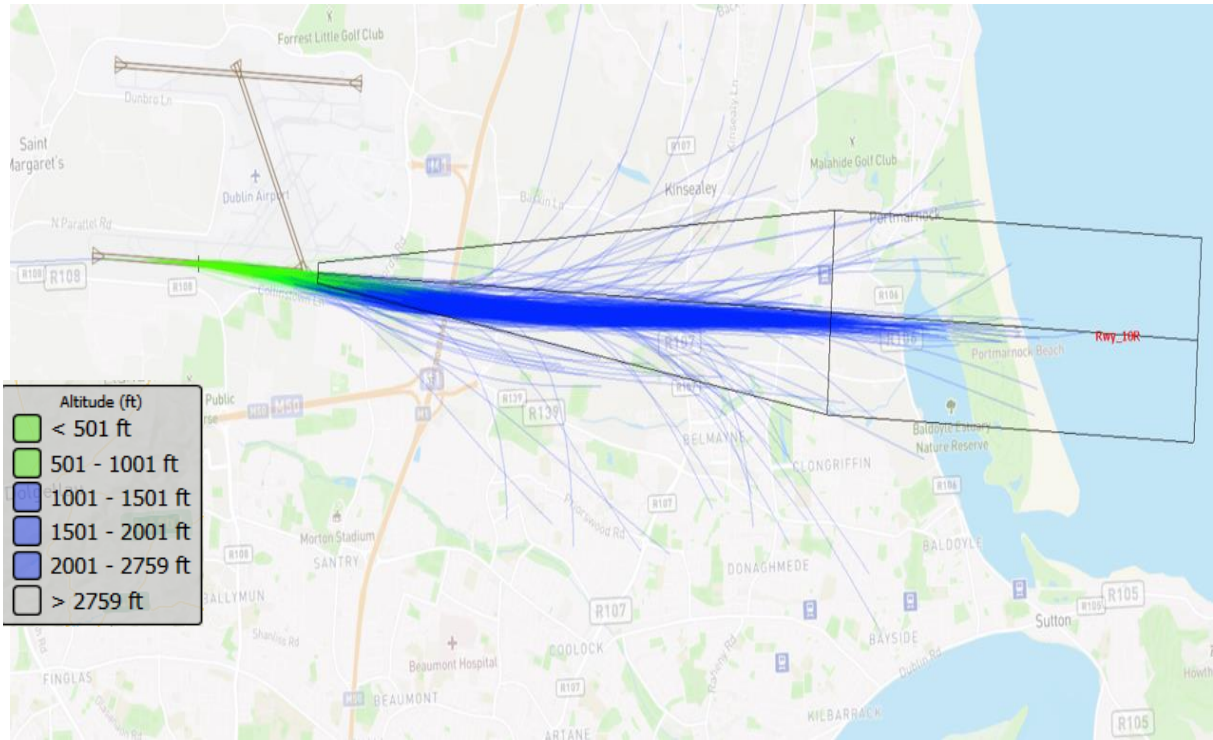


Figure 19 – Runway 10R Violations, Daytime

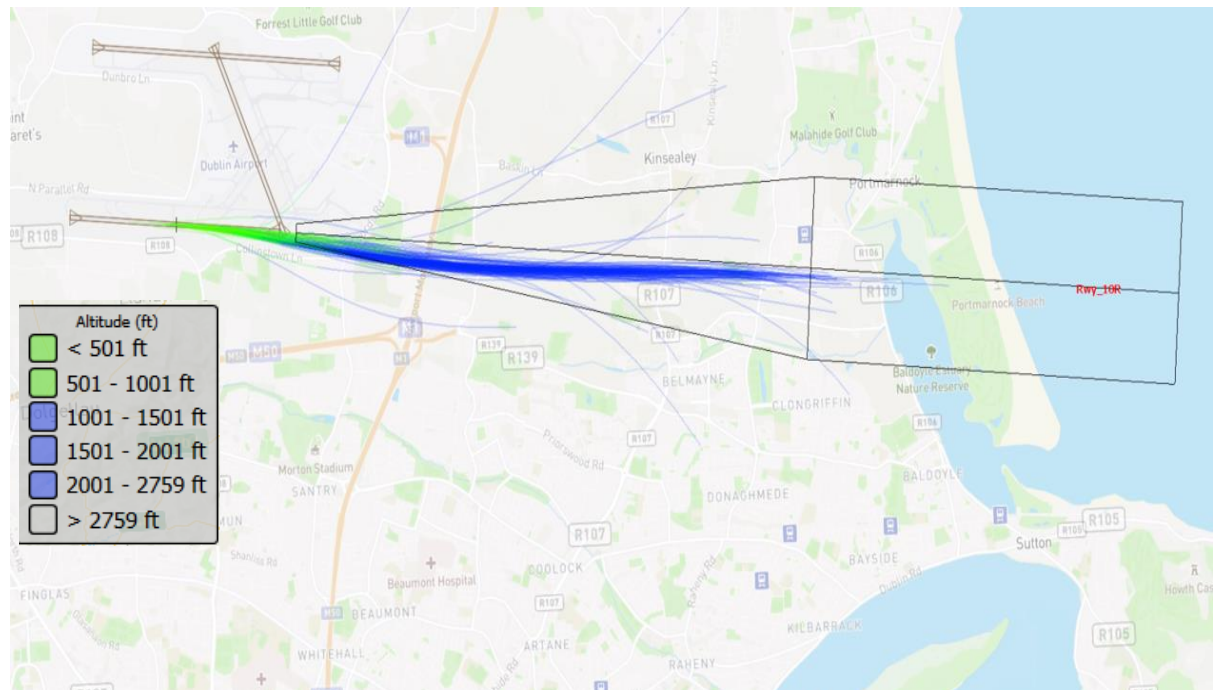


Figure 20 – Runway 10R Violations, Night-time

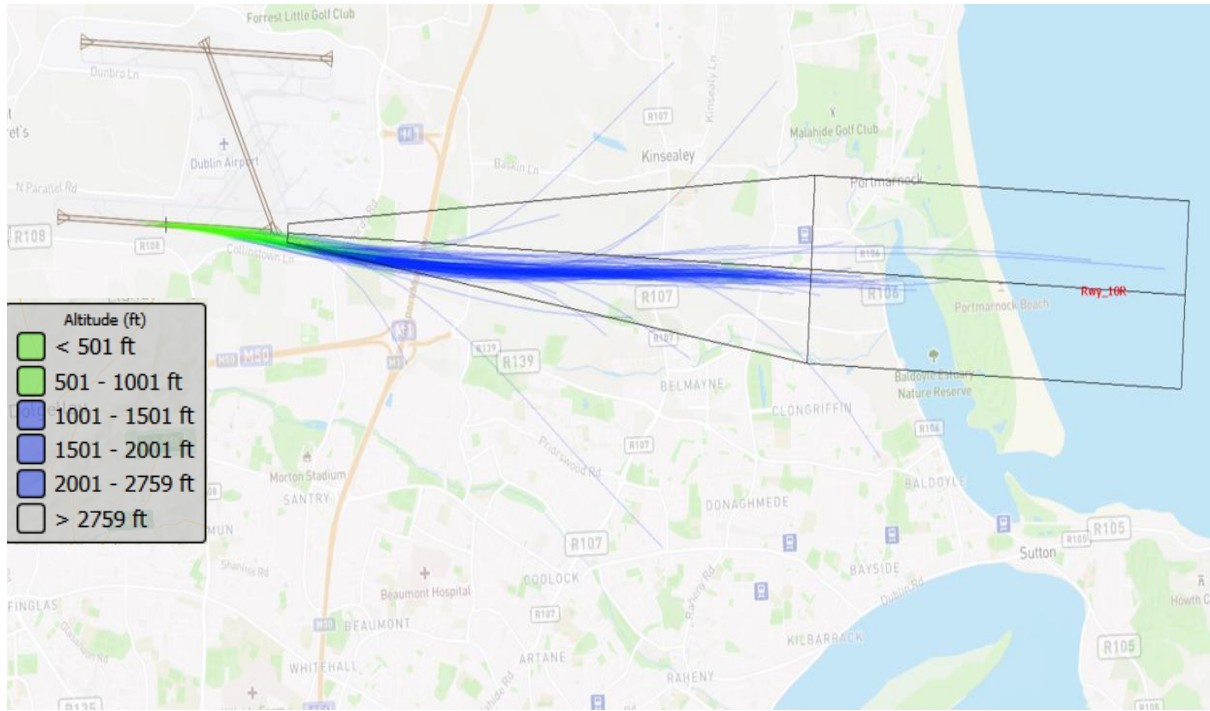


Figure 21 – Runway 10R Violations, Night-time

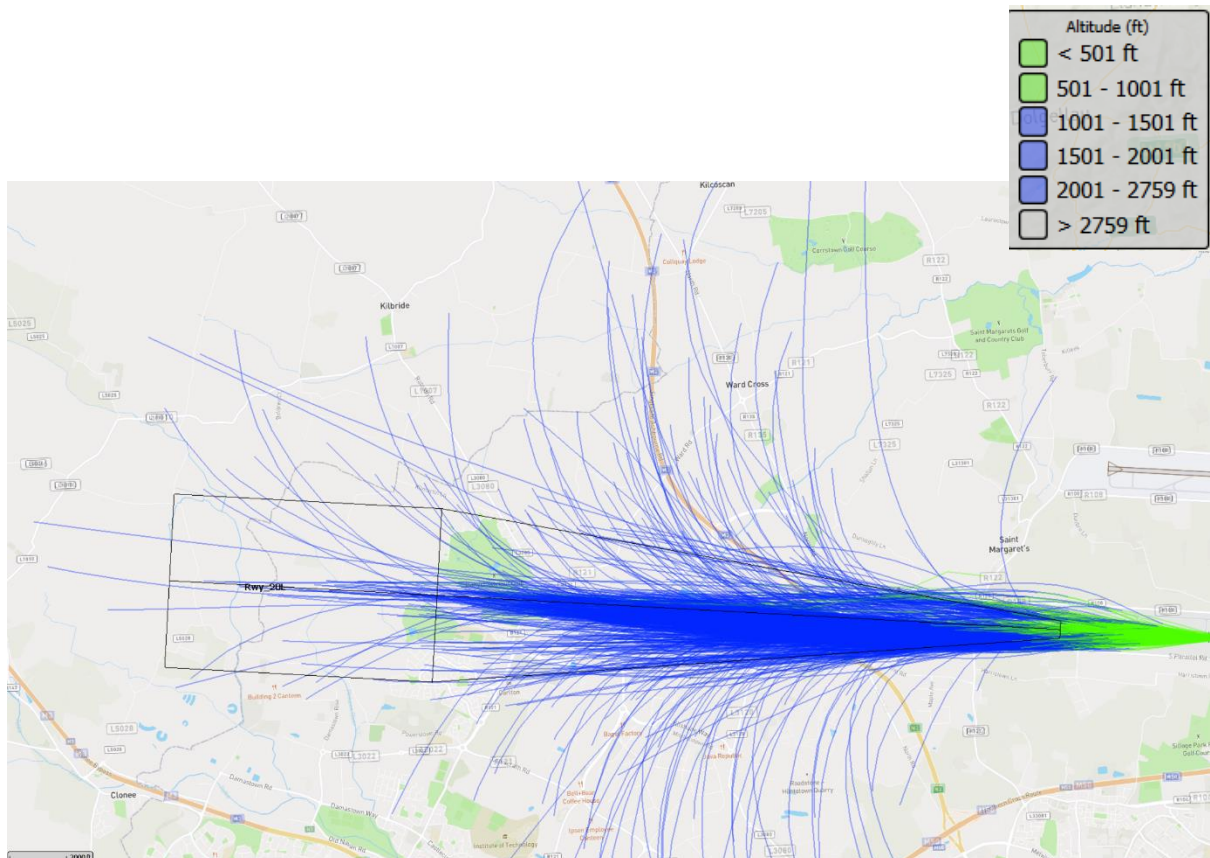


Figure 22 – Runway 28L Violations, Daytime



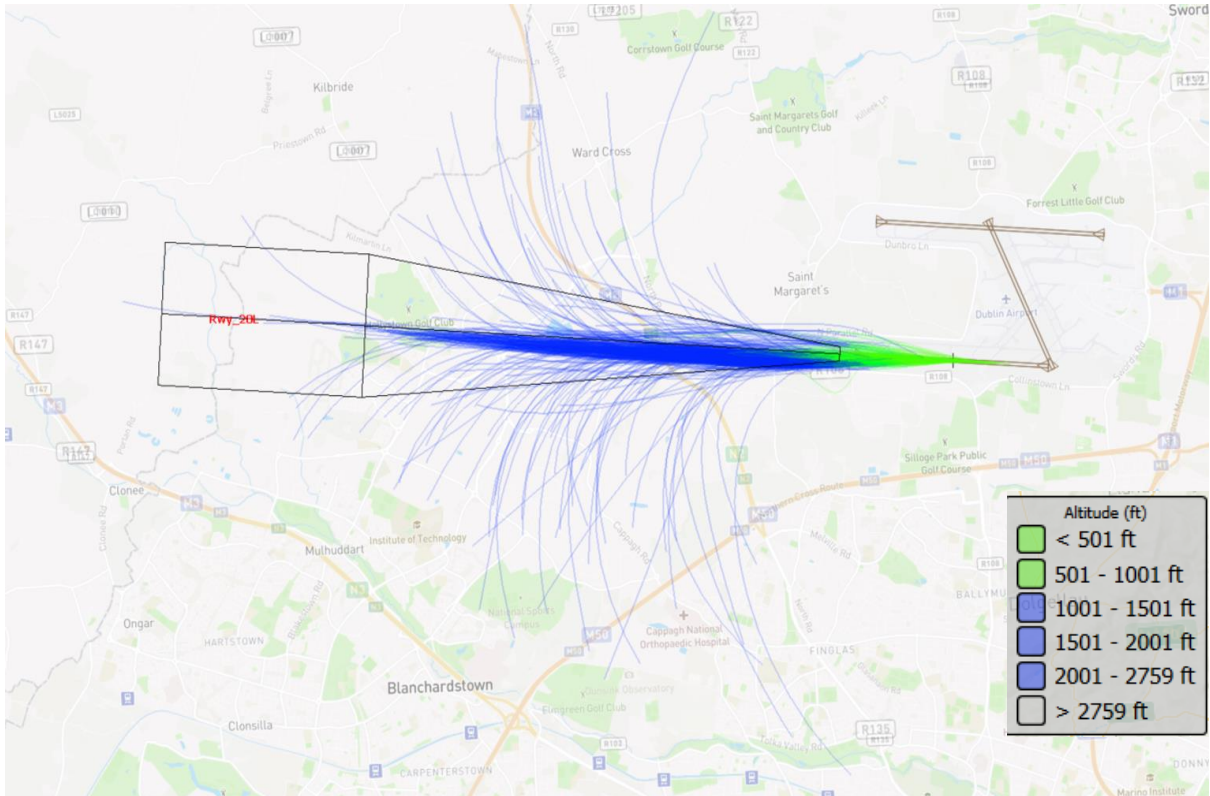


Figure 23 – Runway 28L Violations, Night-time

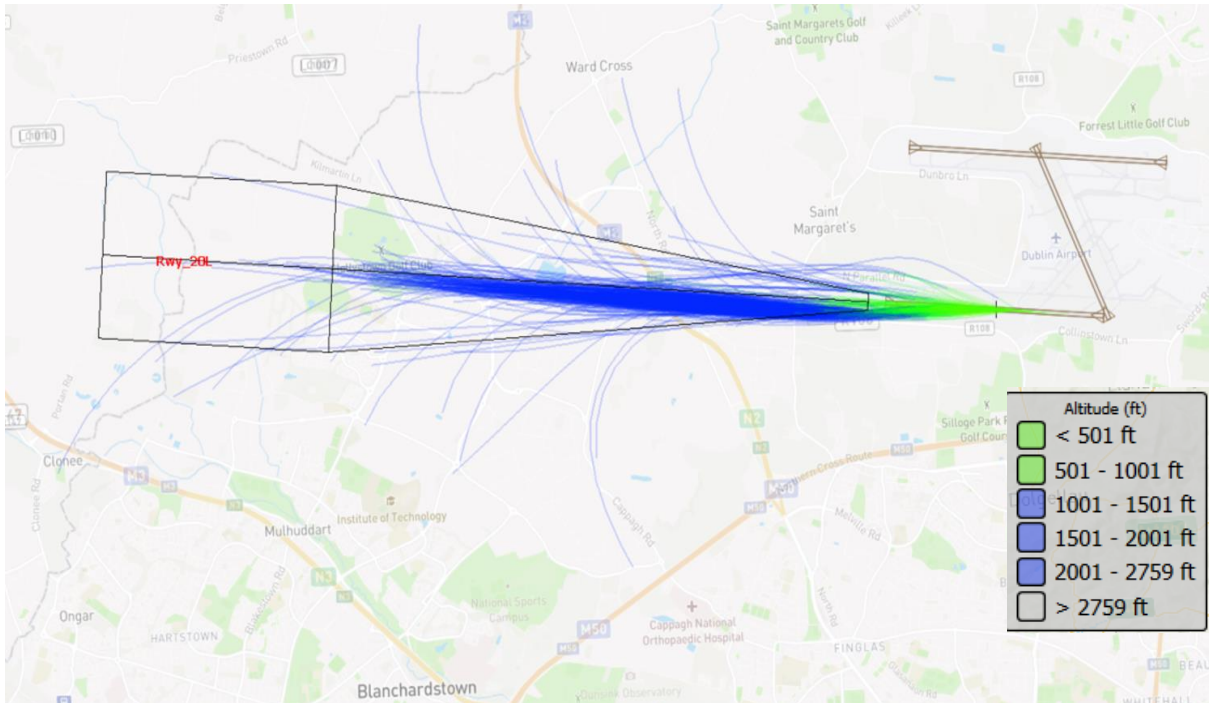


Figure 24 – Runway 28L Violations, Night-time

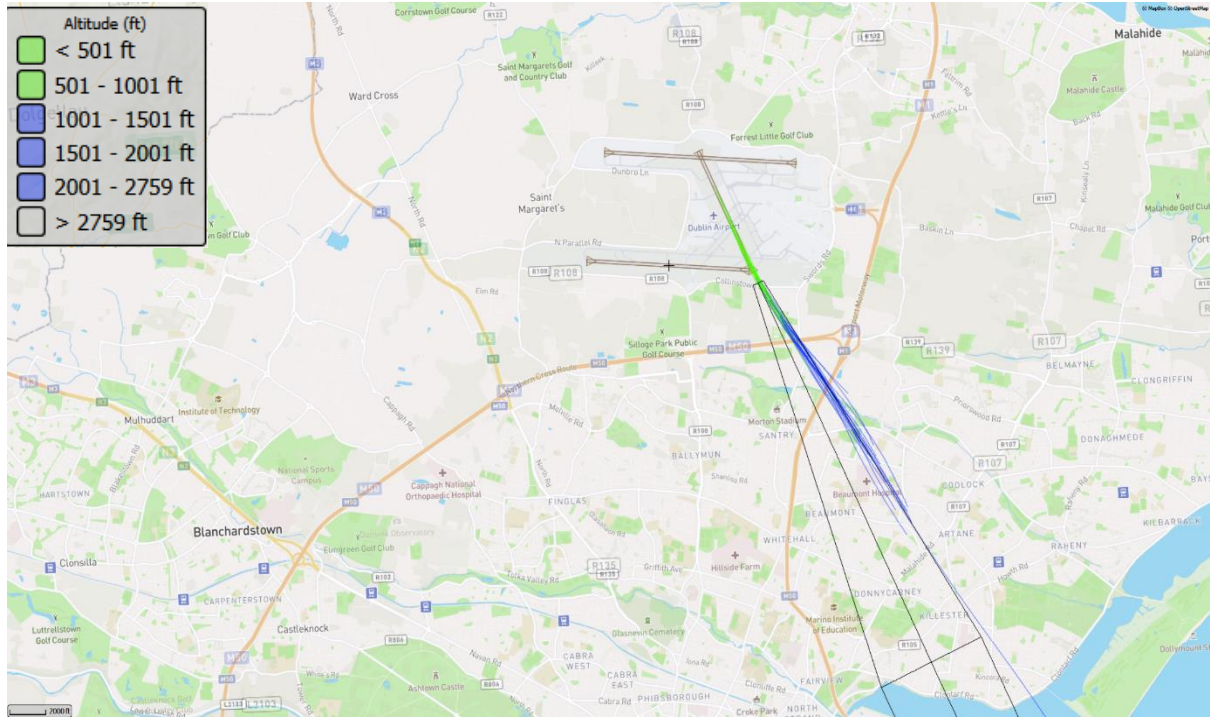


Figure 25 – Runway 16 Violations, Daytime

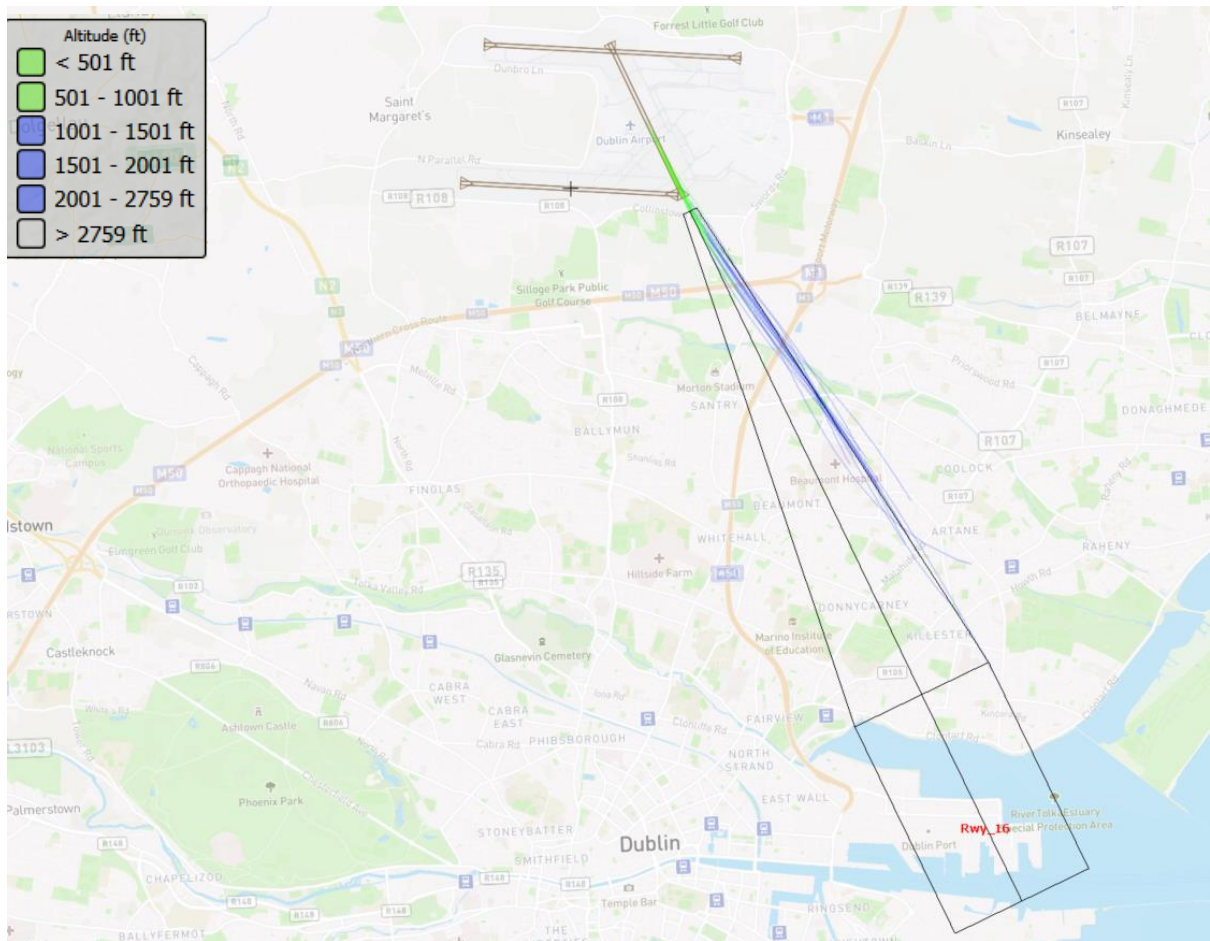


Figure 26 – Runway 16 Violations, Night-time



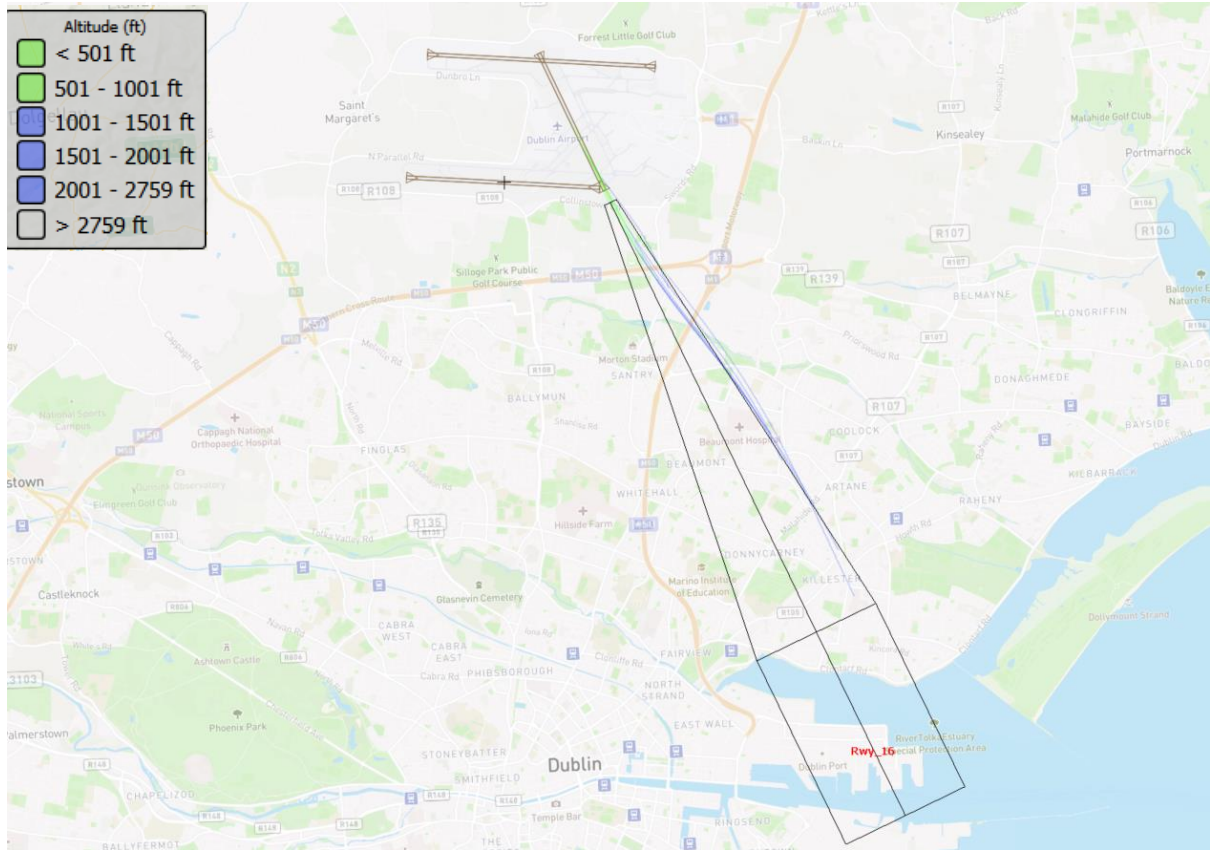


Figure 27 – Runway 16 Violations, Night-time

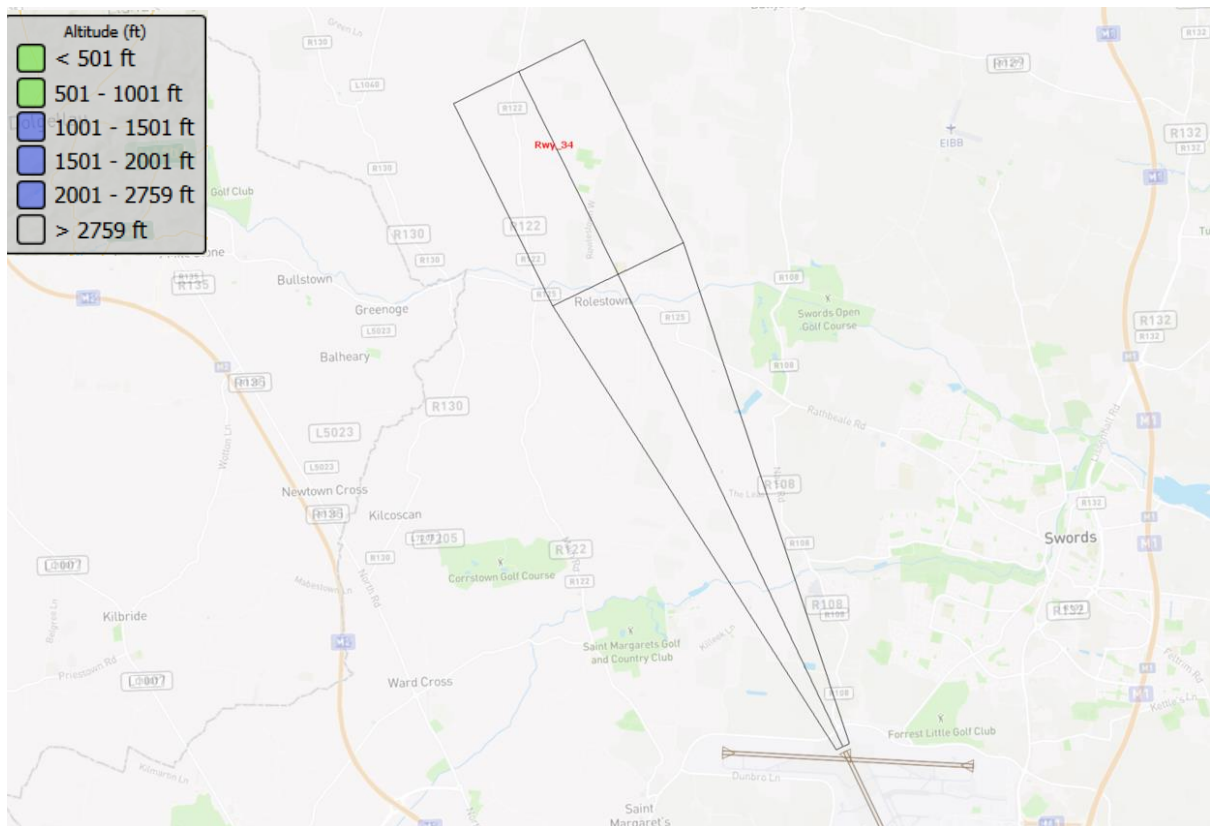


Figure 28 – Runway 34 Violations, All (Daytime, Evening, Night-time)

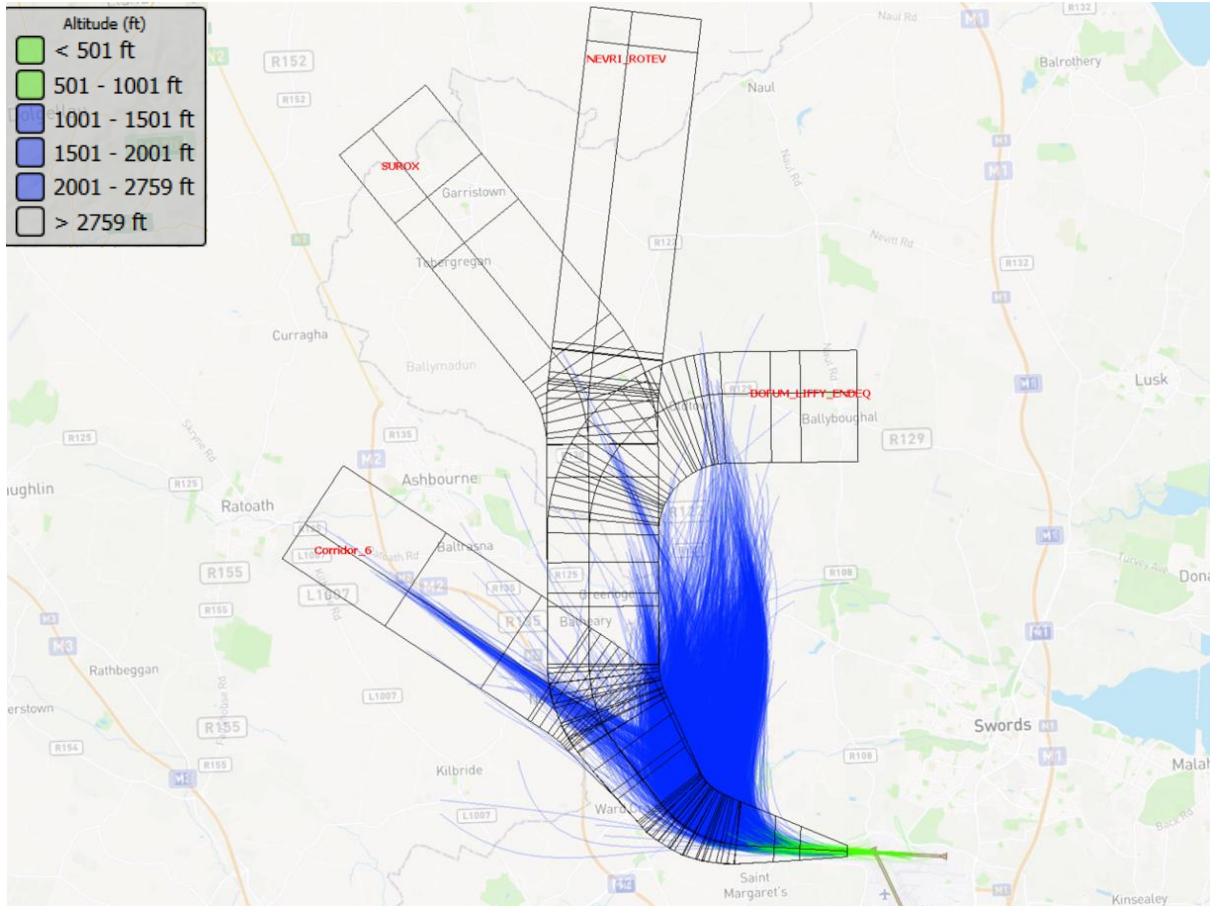


Figure 29<sup>5</sup> – Runway 28R Violations, Daytime

<sup>5</sup> Inclusion of the NPRs applicable from February 23, 2023, provides context to current operation. The majority of the violations noted in figure 29 have since been addressed and corrected.

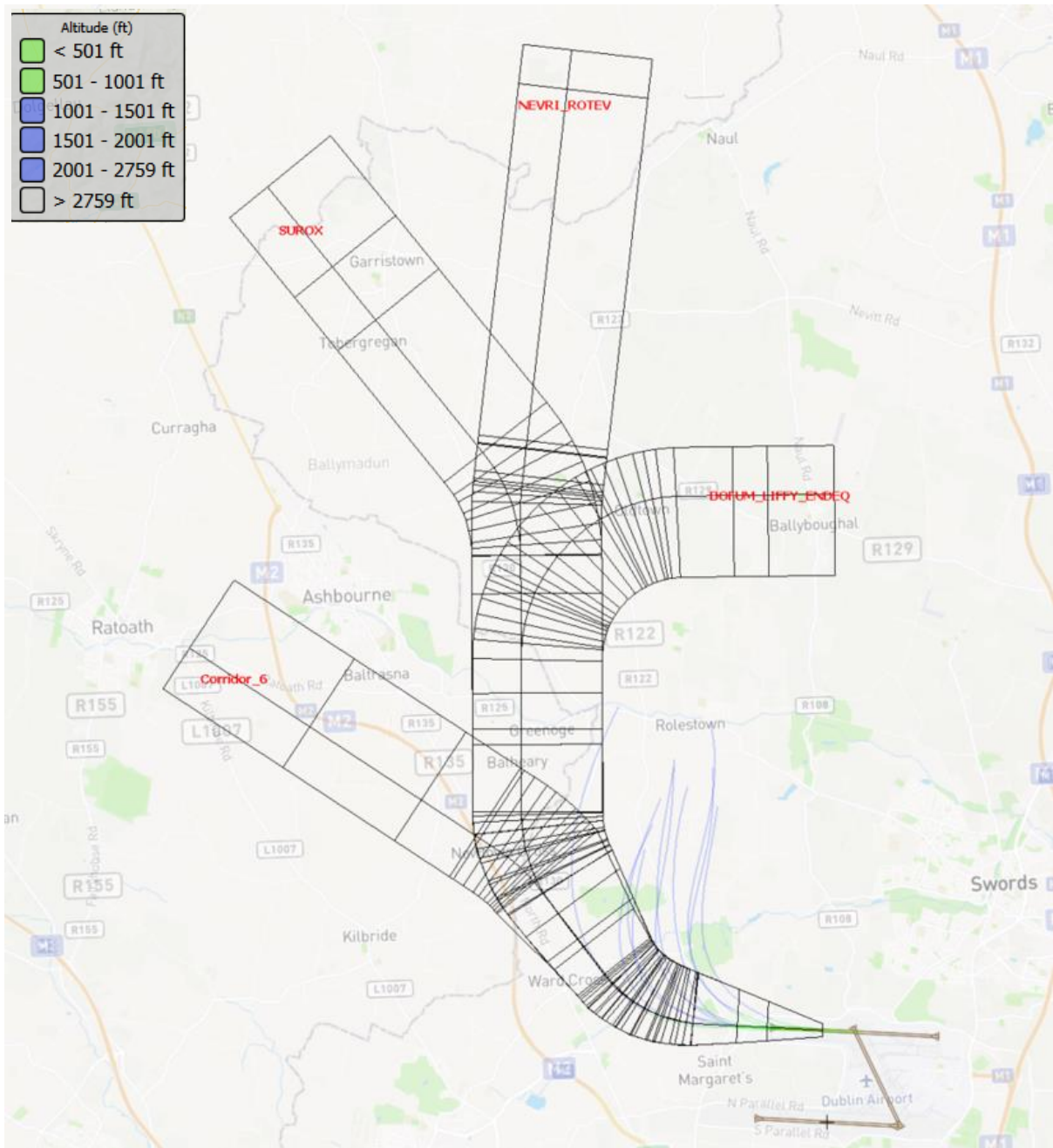


Figure 30 – Runway 28R Violations, Evening and Night-time





Figure 31– Runway 10L Violations, All (Daytime, Evening, Night-time)

## 1.5 Noise Monitoring

Dublin Airport's NFTMS was the subject of an ANCA direction to ensure a minimum deployment of 23 fixed noise monitors by August 24, 2023. **Table 4** lists the NMTs that comprise the NFTMS for 2022.

NMT No.	NMT Type / Classification	Name
NMT 1	Fixed / Permanent	Bay Lane
NMT 2	Fixed / Permanent	St. Doolaghs
NMT 3	Fixed / Permanent	Bishopswood
NMT 4	Fixed / Permanent	Feltrim
NMT 5	Fixed / Permanent	Balcultry
NMT 6	Fixed / Permanent	Artane
NMT 7	Fixed / Permanent	Swords
NMT 8	Fixed / Permanent	Malahide Demesne
NMT 9	Mobile / Temporary	Newtown
NMT 10	Fixed / Permanent	St. Margaret's
NMT 20	Fixed / Permanent	Portmarnock

Table 4 – Schedule of Noise Monitoring Terminals in place in 2022

The system consists of eleven NMTs, which are installed in the area around the airport. The current system is provided by Envirosuite and has seen the deployment of NMTs increase from seven in 2021.

The NMTs are set to record continuously and 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 their proximity to agricultural areas, roads, and/or urban areas, NMTs can be triggered not just by aviation noise. Therefore, 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 32** shows the locations of the NMTs in 2022, which are the following:

- NMT 1: Bay Lane, monitoring Runway 28L departures and Runway 10R arrivals.
- NMT 2: St. Doolaghs, monitoring Runway 10R departures and Runway 28L arrivals.
- NMT 3: Bishopswood, monitoring Runway 28R departures, Runway 10L arrivals and the local area.
- NMT 4: Feltrim, monitoring Runway 10L departures, Runway 28R Arrivals and the local area.
- NMT 5: Balcultry, monitoring Runway 34 departures and Runway 16 arrivals and the local area.
- NMT 6: Artane, monitoring Runway 16 departures and Runway 34 arrivals.
- NMT 7: Swords, monitoring Runway 28R departures and Runway 34 arrivals.
- NMT 8: Malahide, monitoring Runway 16 departures and Runway 34 arrivals and the local area.
- NMT 9: Newtown, monitoring Runway 28L departures, Runway 10R arrivals and the local area.
- NMT 10: St. Margarets, monitoring Runway 28R departures, Runway 10L arrivals and the local area.
- NMT 20: Coast Road, monitoring Runway 10 departures and Runway 28 arrivals.

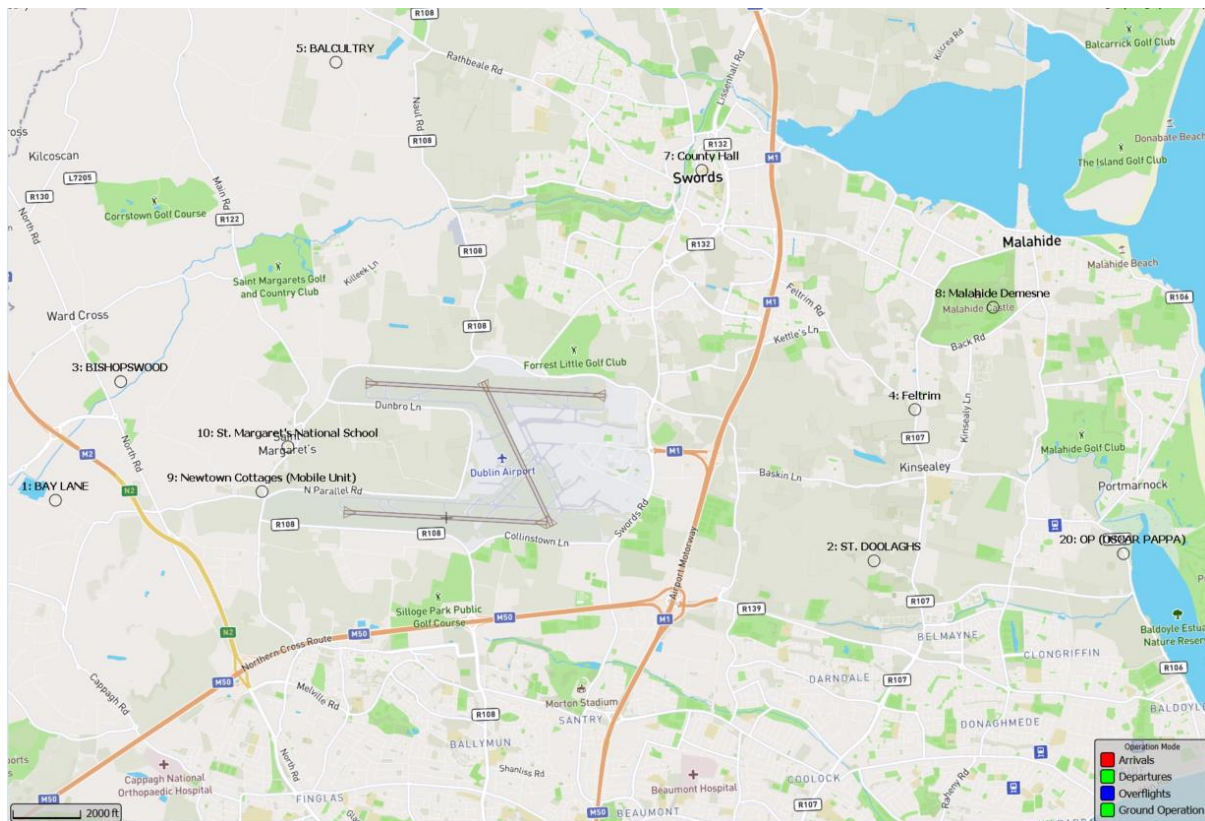


Figure 32 – Locations of Noise Monitoring Terminals in 2021

## 1.5.1 Noise Monitoring Terminal Operational Status 2022

**Figure 34** shows the percentage of time the NMTs were operational during 2022. To ensure NMTs continue working within specific limits, internal calibration checks are completed every 6 hours, during which the NMTs are out of operation for short periods of time and do not record noise events. The figure shows that all NMTs were operational for an average 99% of the time. Note that the installation of the additional NMTs 7,8,9 and 10 at various times throughout the year has not allowed detail of operational status to be provided.

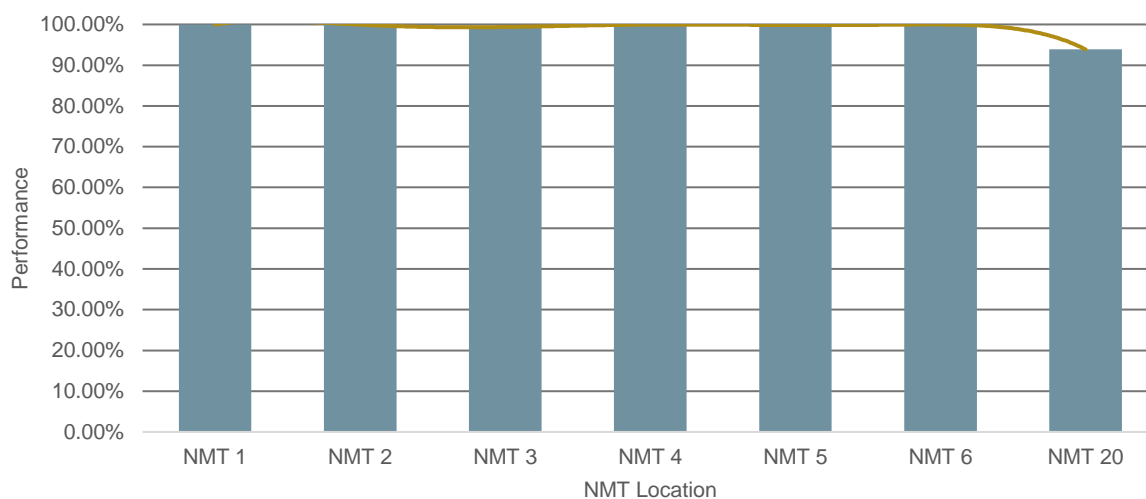


Figure 34 – Uptime and Operational Status of Noise Monitoring Terminals, January – December 2022

NMT Location	Performance
NMT 1	99.98%
NMT 2	99.95%
NMT 3	99.38%
NMT 4	99.95%
NMT 5	99.84%
NMT 6	99.99%
NMT 20	93.87%
<b>Average</b>	<b>99.00%</b>

Table 4 – Uptime and Operational Status of Noise Monitoring Terminals, January – December 2022

## 1.5.2 Noise Events

As previously described, the NFTMS 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 flight paths, the NMTs record less or more aircraft noise. NMTs located directly under the flight paths of Runway 10L/28R (NMTs 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. **Figure 35** details the noise events by NMT for 2022.

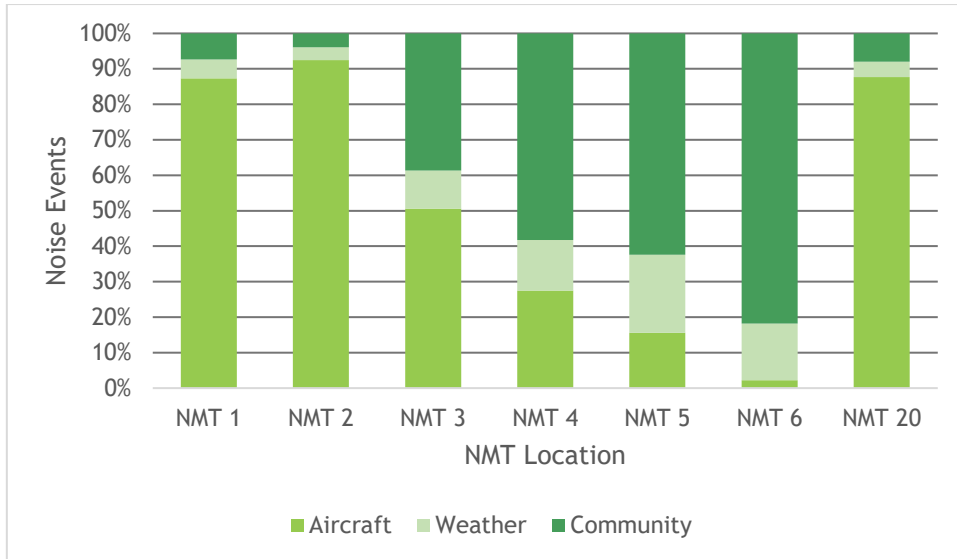


Figure 35 – Noise Events Breakdown per Noise Monitoring Terminal

### 1.5.3 Average Hourly Noise Levels per Noise Monitoring Terminal

Figures 36 through 49 present the average hourly noise levels, as measured by the NMTs. Total noise (all noise events) and noise related to aircraft movements are presented.

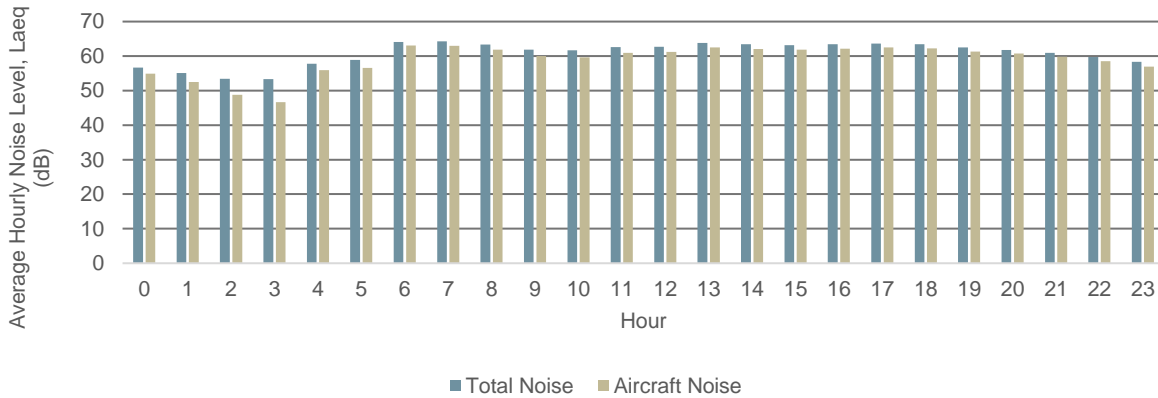


Figure 36 – Noise Monitoring Terminal 1 Hourly Noise (24-hour period, 0 - 00:00, 23 - 23:00)

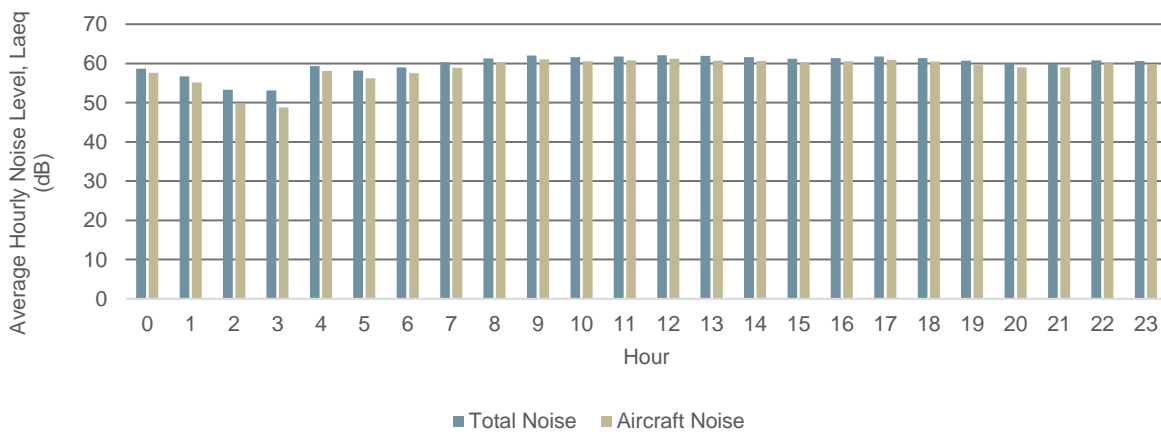


Figure 37– Noise Monitoring Terminal 2 Hourly Noise (24-hour period, 0 - 00:00..., 23 - 23:00)

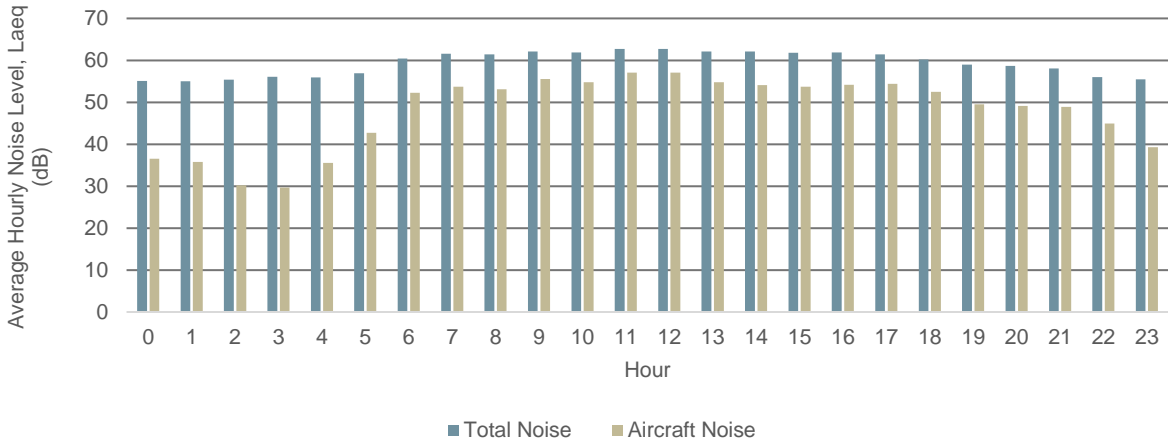


Figure 38 – Noise Monitoring Terminal 3 Hourly Noise (24-hour period, 0 - 00:00,23 - 23:00)

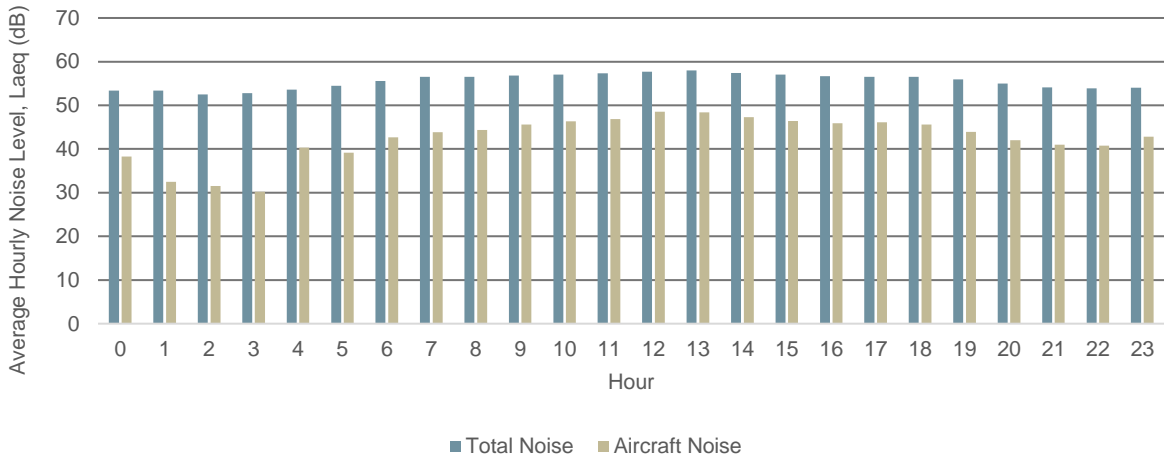


Figure 39 – Noise Monitoring Terminal 4 Hourly Noise (24-hour period, 0 - 00:00, 23 - 23:00)

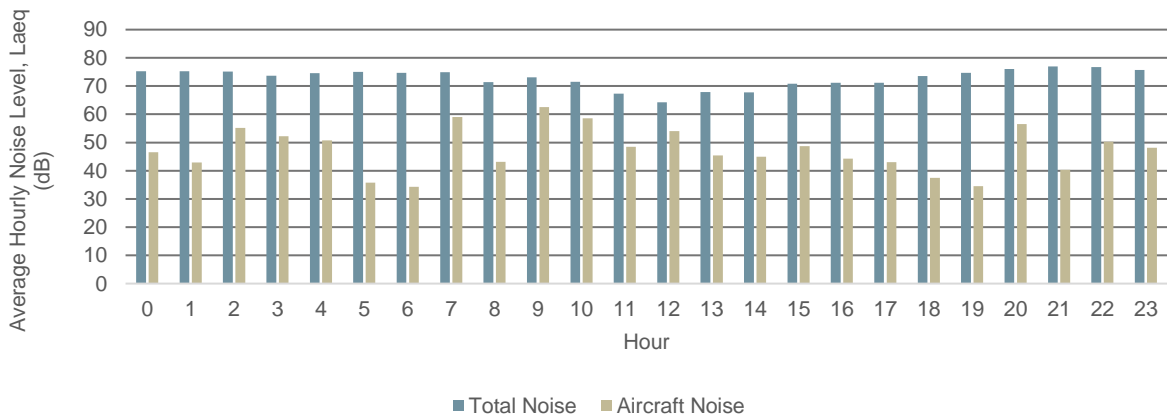


Figure 40 – Noise Monitoring Terminal 5 Hourly Noise (24-hour period, 0 - 00:00, 23 - 23:00)

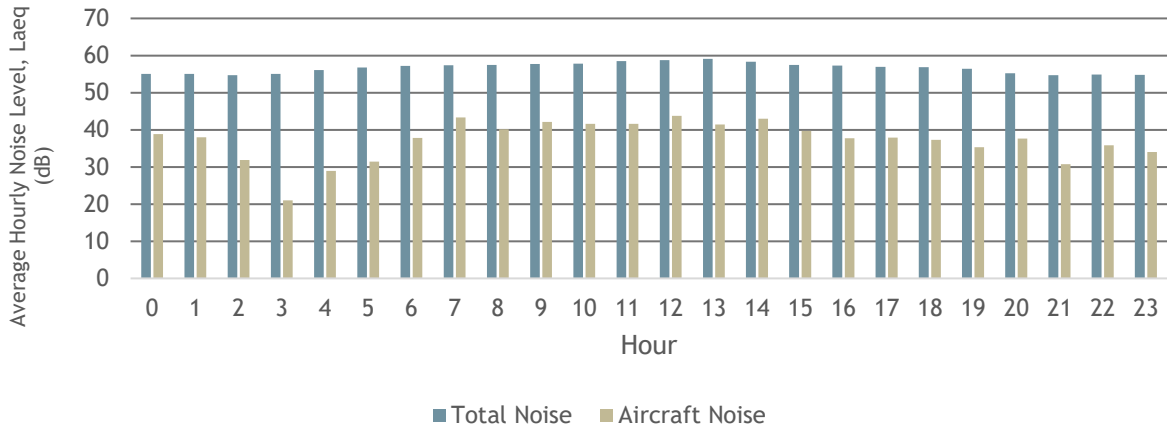


Figure 41 – Noise Monitoring Terminal 6 Hourly Noise (24-hour period, 0 - 00:00, .23 - 23:00)

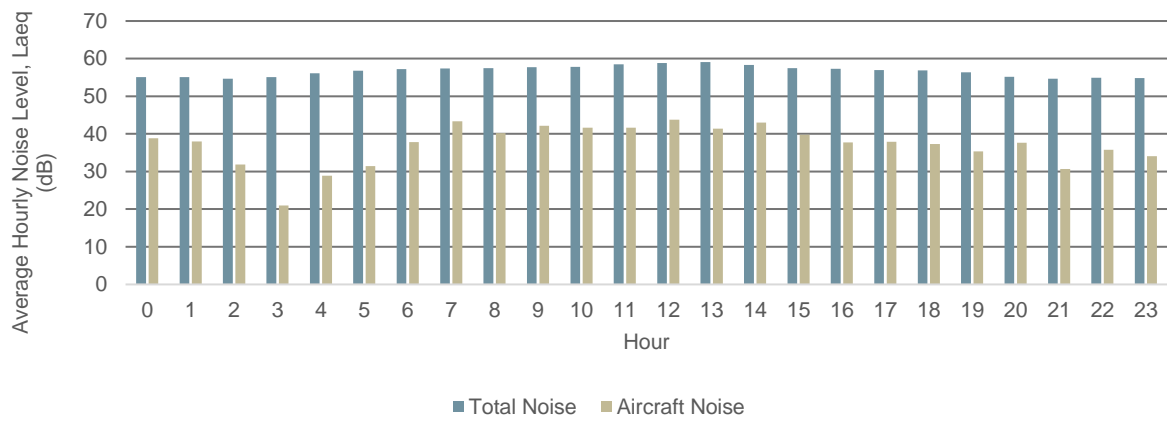


Figure 42 – Noise Monitoring Terminal 20 Hourly Noise (24-hour period, 0 - 00:00, .23 - 23:00)

### 1.5.4 Average Noise Levels per Noise Monitoring Terminal – Daytime

Figures 43 through 49 present the average noise levels during the daytime period (07:00 to 23:00), as measured by the NMTs. Recorded noise levels during this time segment are averaged over the 16-hour period. This procedure is followed for total noise (all noise events) and for events that are correlated to aircraft movements. The results shown are presented per month.

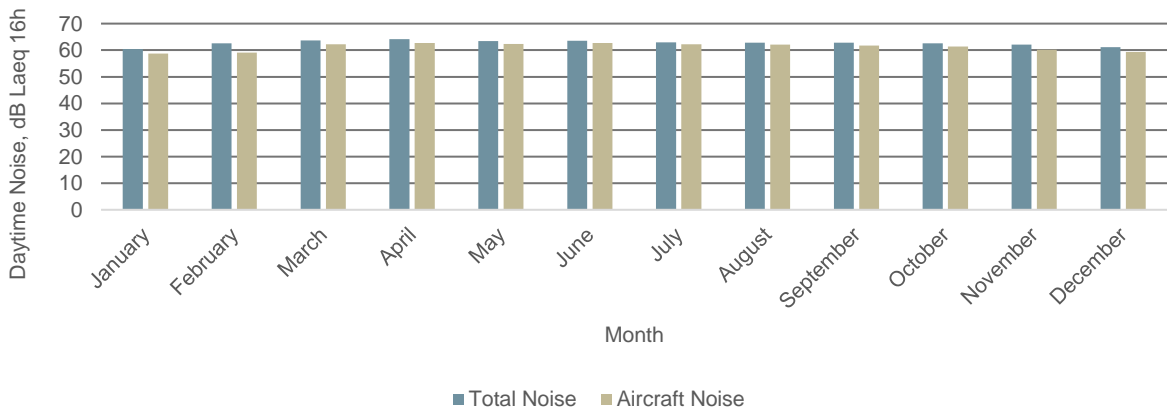


Figure 43 – Noise Monitoring Terminal 1 Daytime Noise

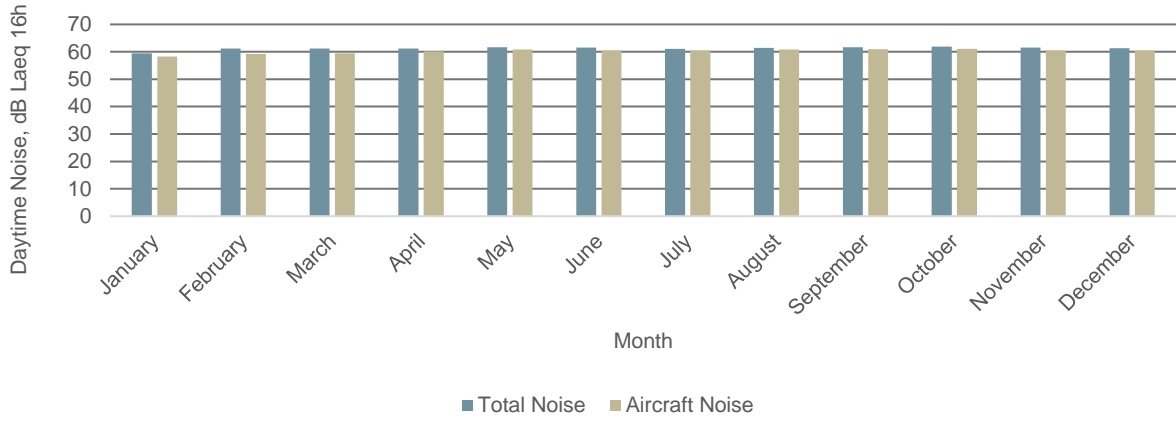


Figure 44 – Noise Monitoring Terminal 2 Daytime Noise

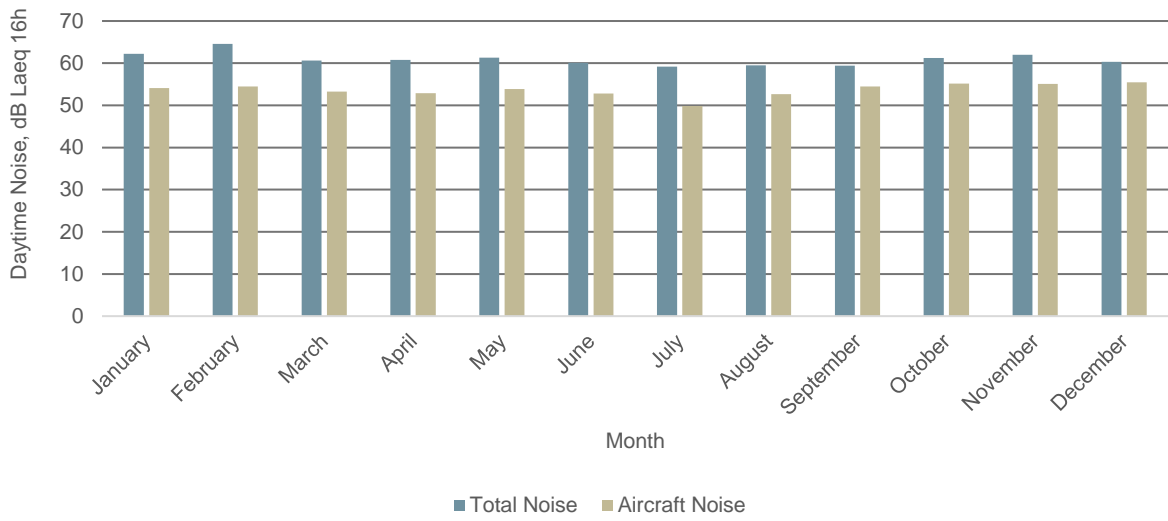


Figure 45 – Noise Monitoring Terminal 3 Daytime Noise

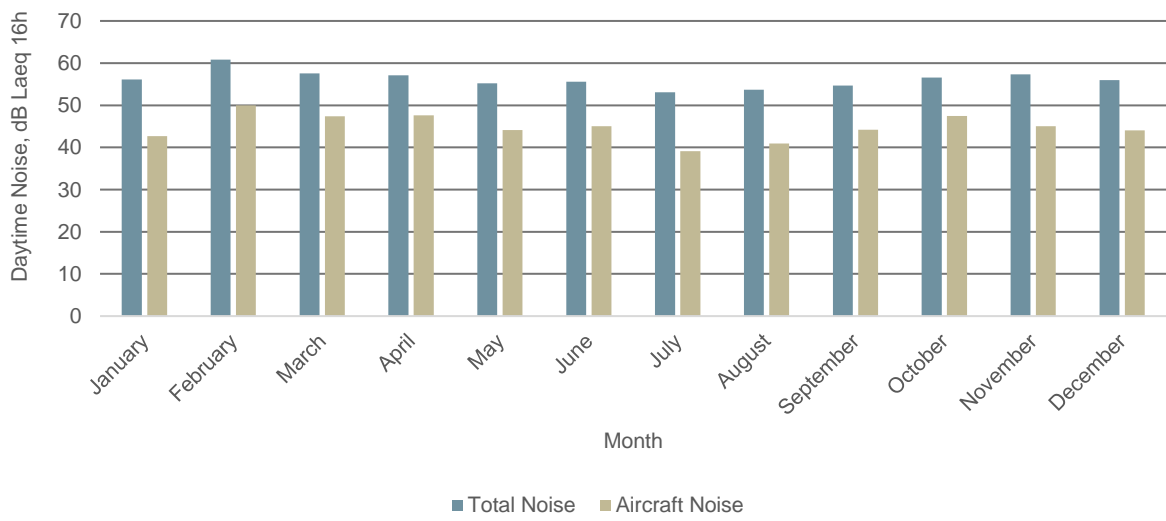


Figure 46 – Noise Monitoring Terminal 4 Daytime Noise

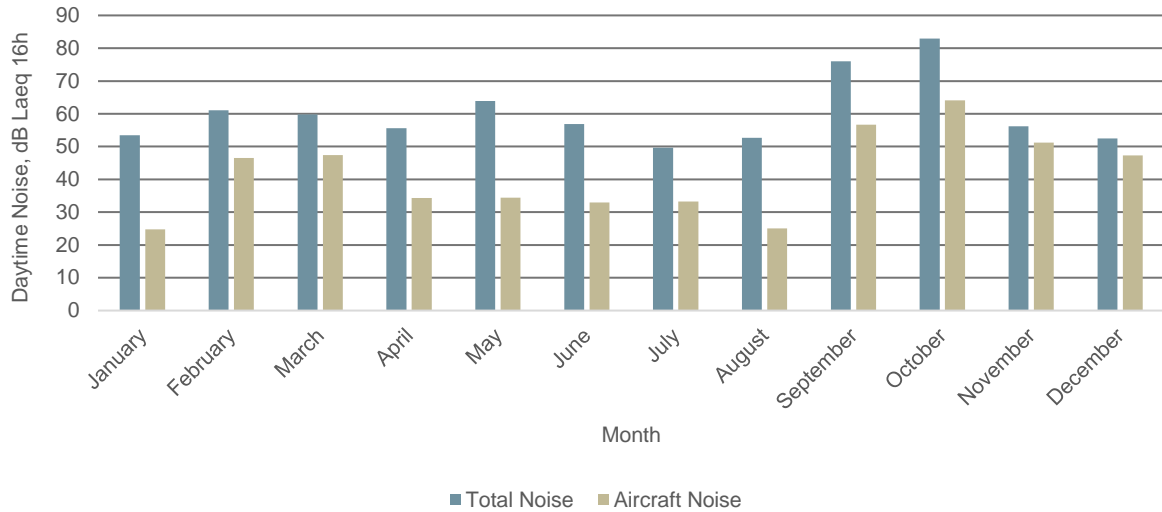


Figure 47 – Noise Monitoring Terminal 5 Daytime Noise

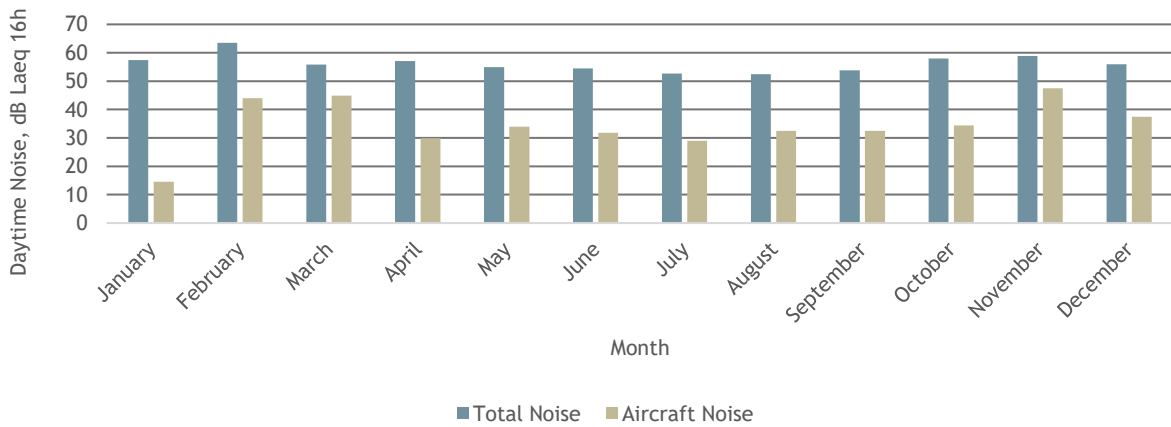


Figure 48 – Noise Monitoring Terminal 6 Daytime Noise

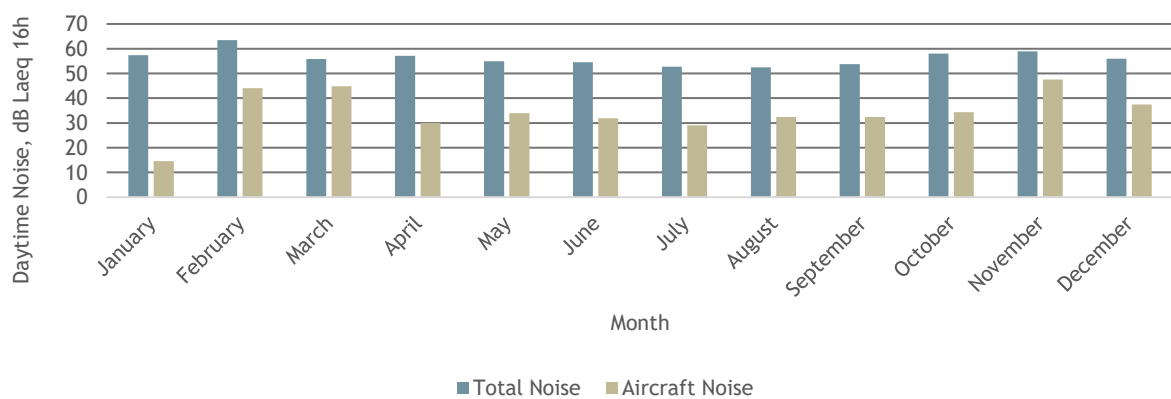


Figure 49 – Noise Monitoring Terminal 20 Daytime Noise

### 1.5.5 Average Noise Levels per Noise Monitoring Terminal – Night-time

Figures 50 through 56 present the average noise levels during the night-time period (23:00 to 07:00), as measured by the NMTs. Recorded noise levels during this time segment are averaged over the 8-hour period.



This procedure is followed for total noise (all noise events) and events that are correlated to aircraft movements. The results shown are presented per month.

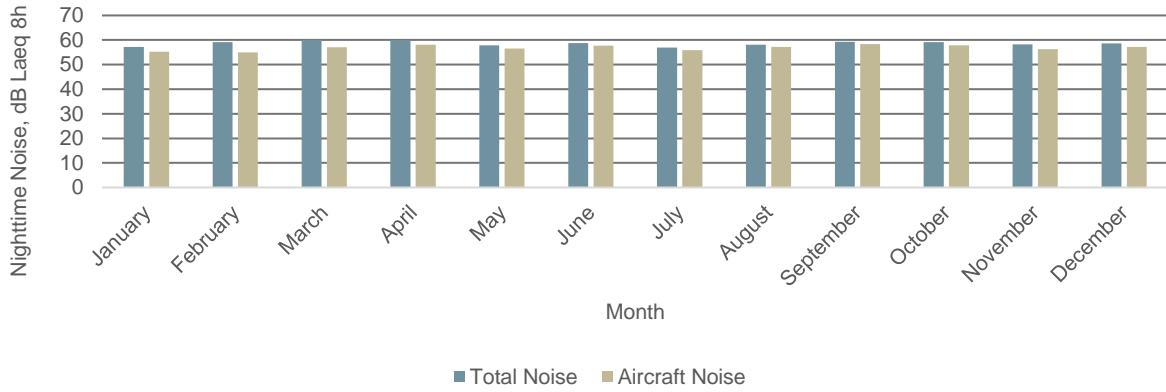


Figure 50 – Noise Monitoring Terminal 1 Night-time Noise

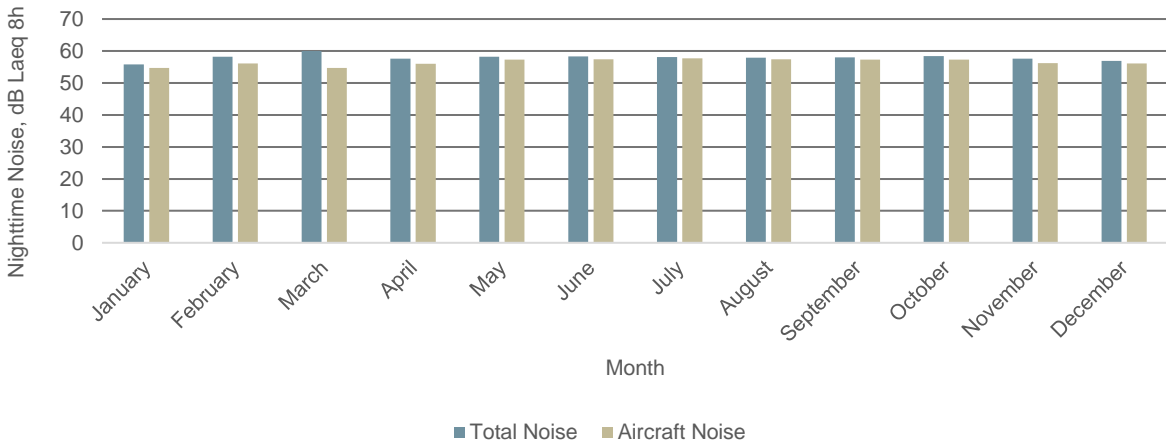


Figure 51 – Noise Monitoring Terminal 2 Night-time Noise

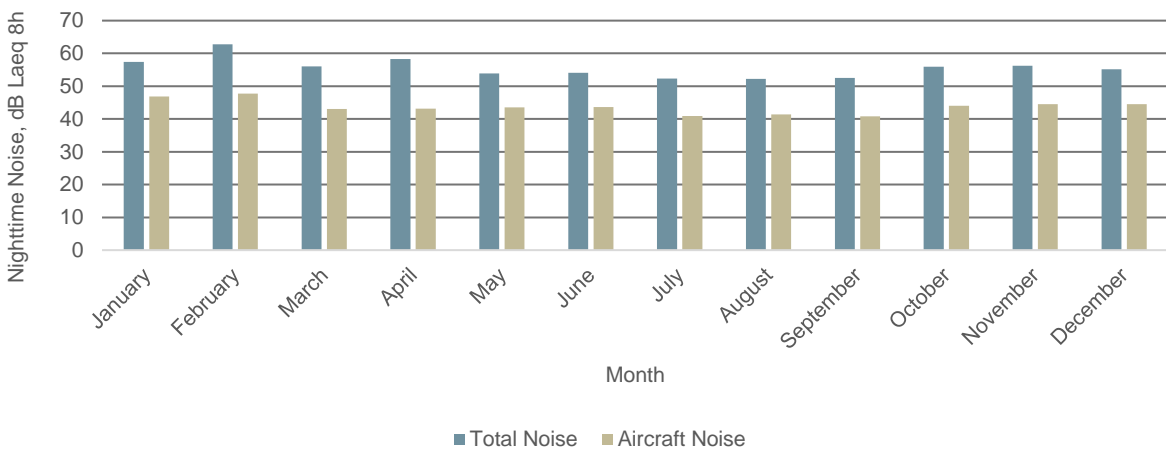


Figure 52 – Noise Monitoring Terminal 3 Night-time Noise

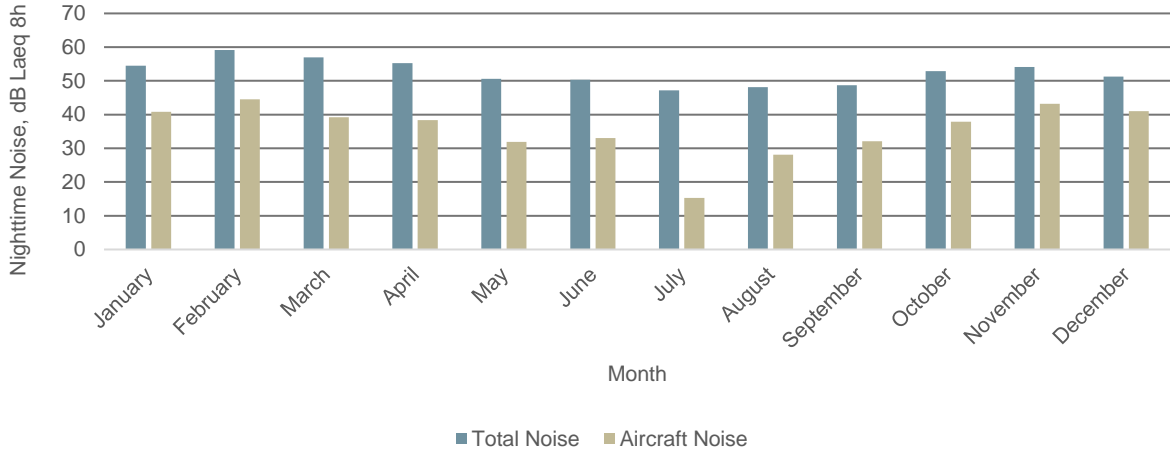


Figure 53 – Noise Monitoring Terminal 4 Night-time Noise

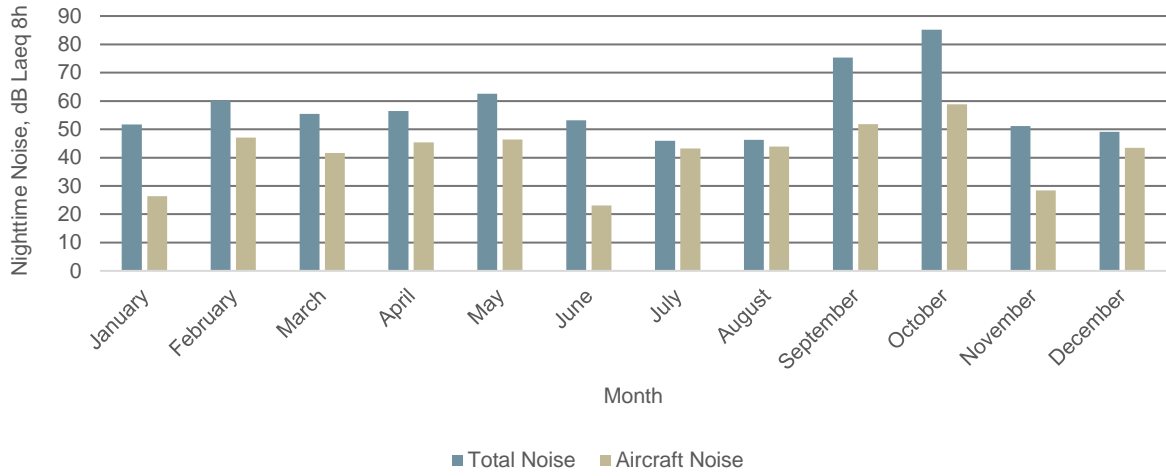


Figure 54 – Noise Monitoring Terminal 5 Night-time Noise

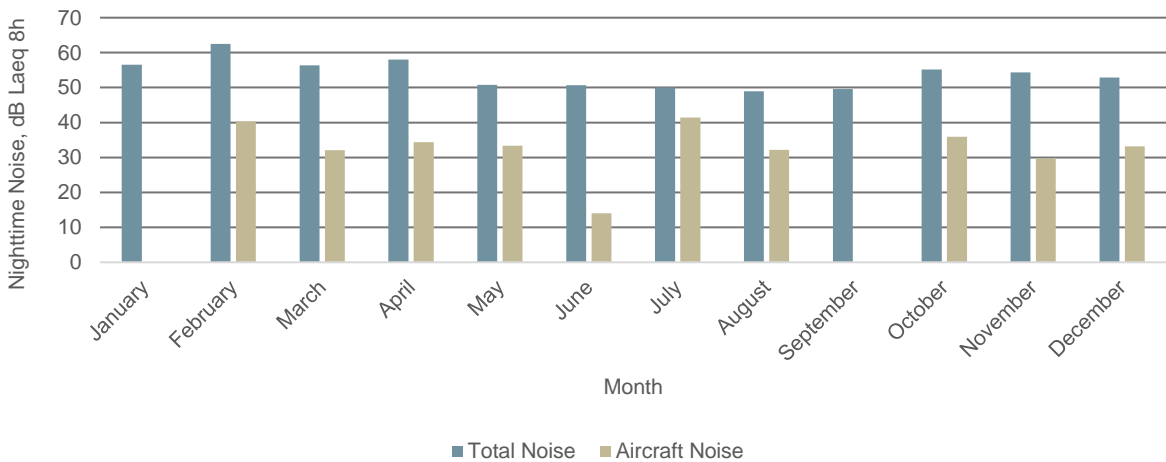


Figure 55 – Noise Monitoring Terminal 6 Night-time Noise

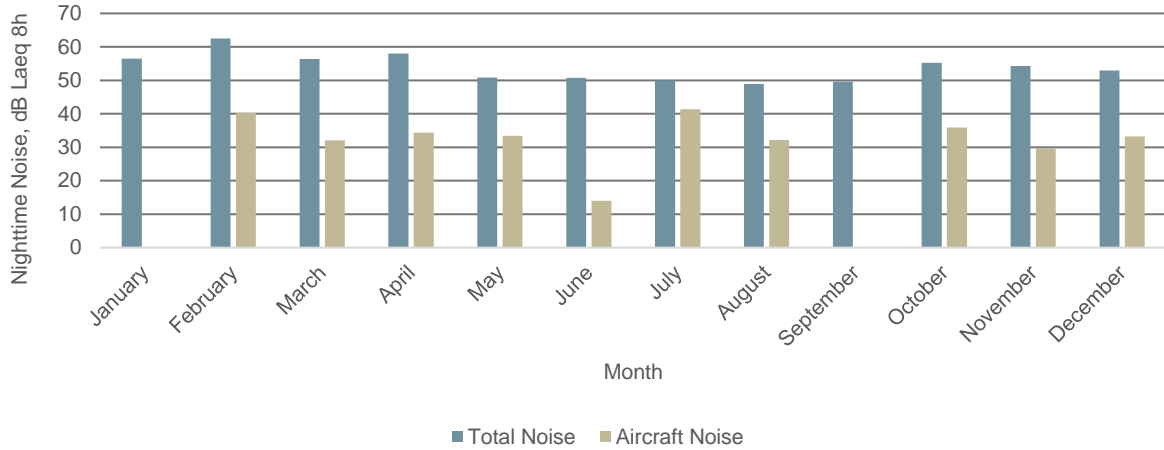


Figure 56 – Noise Monitoring Terminal 20 Night-time Noise

### 1.5.6 Maximum sound Levels per Noise Monitoring Terminal ( $L_{Amax}$ )

Figures 57 through 63 show the  $L_{Amax}$  distribution for aircraft noise per NMT.  $L_{Amax}$  indicates the maximum recorded noise level per correlated aircraft noise event. The distribution is calculated by determining the number of occurrences per 5-decibel (dB) band.

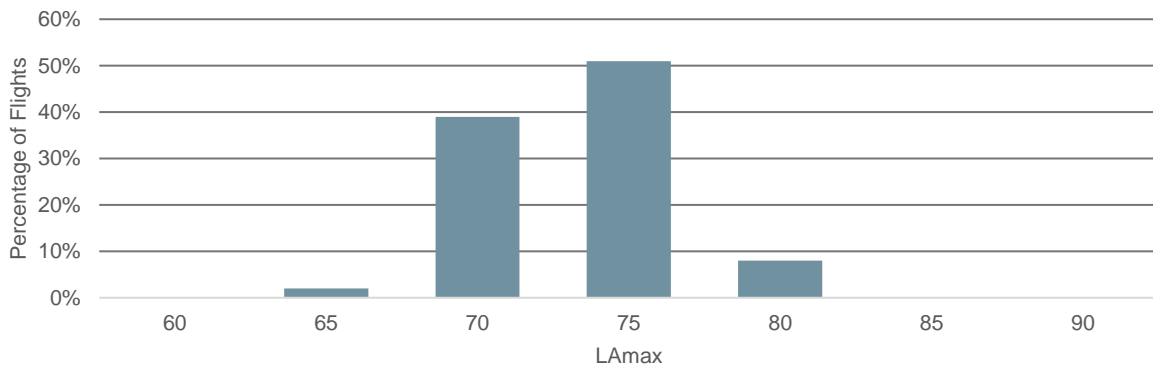


Figure 57 – Noise Monitoring Terminal 1  $L_{Amax}$  Noise

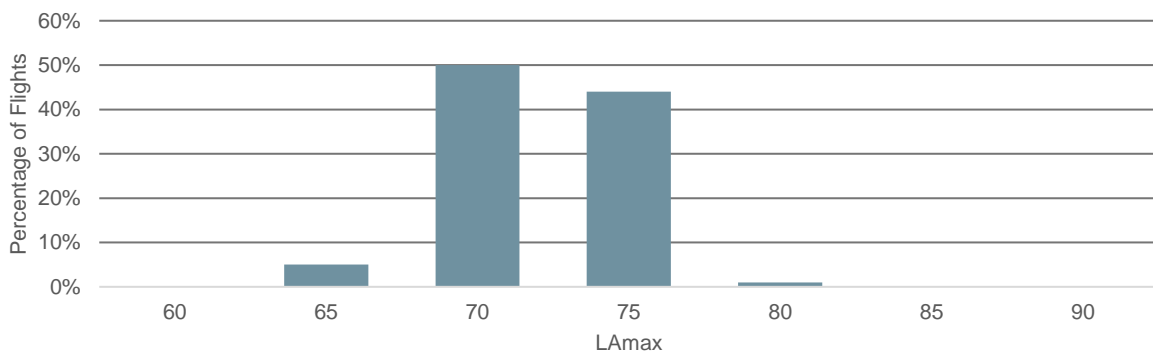


Figure 58 – Noise Monitoring Terminal 2  $L_{Amax}$  Noise

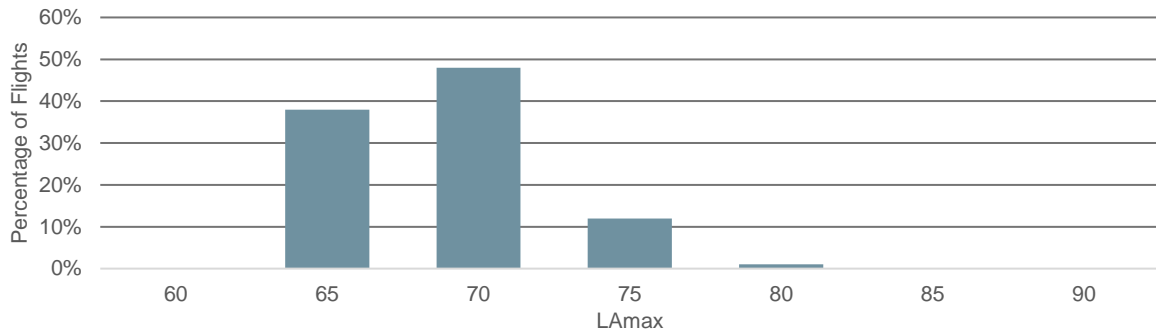


Figure 59 – Noise Monitoring Terminal 3  $L_{Amax}$  Noise

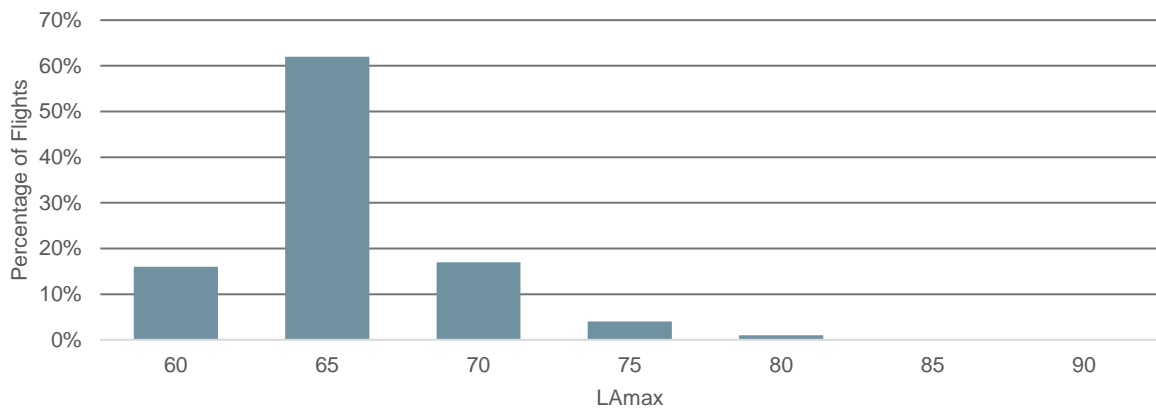


Figure 60 – Noise Monitoring Terminal 4  $L_{Amax}$  Noise

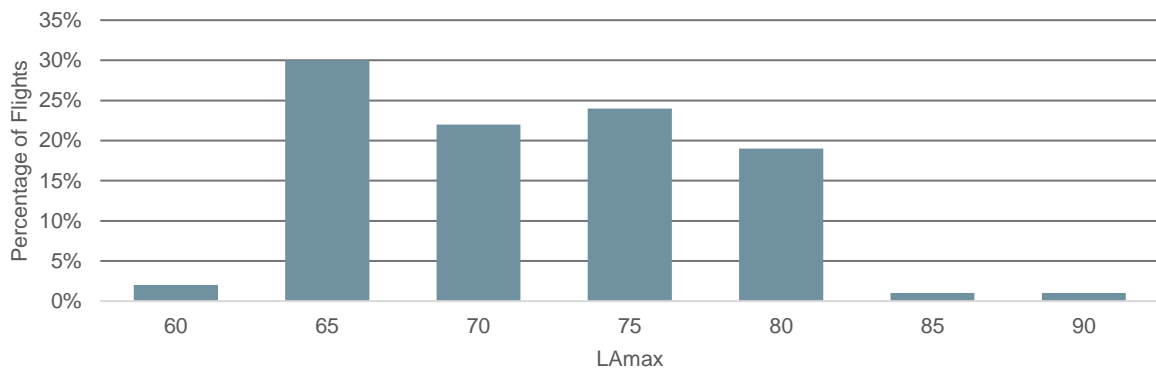


Figure 61 – Noise Monitoring Terminal 5  $L_{Amax}$  Noise

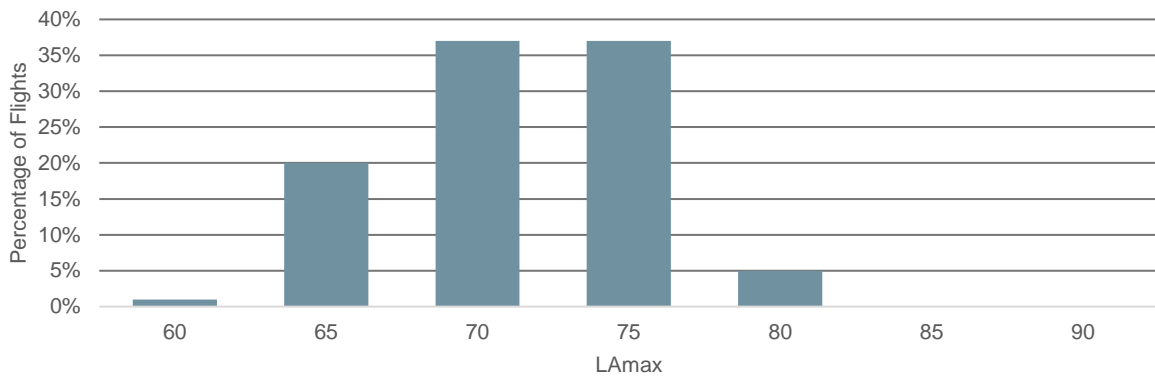


Figure 62 – Noise Monitoring Terminal 6  $L_{Amax}$  Noise

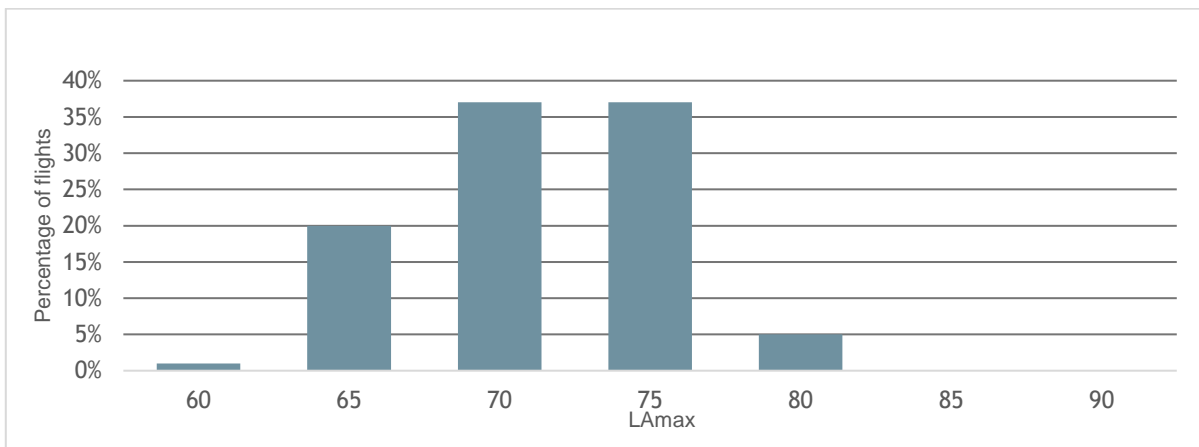


Figure 63 – Noise Monitoring Terminal 20  $L_{Amax}$  Noise

### 1.5.7 Measured Noise Levels

A request has been made to explain some of the reported measured noise levels and some “significant differences” between the total and aircraft noise levels.

A Noise Monitoring Terminal continuously monitors the sound pressure level incident at its microphone. This includes both aircraft noise and other noise such as road traffic or other community noise. Wind can induce noise at the cylindrical tip of the microphone although a foam windsock is permanently attached to decrease this wind noise.

The ANOMS system continuously monitors the noise signal at each NMT. If the noise level rises above the pre-set threshold level of an NMT and then drops below the threshold within the minimum and maximum time limits, this is labelled as a Noise Event.

The time and the NMT location of each measured noise event is compared to the flight track data of aircraft movements. If a Noise Event matches an aircraft movement, then the Noise Event is labelled as Correlated and the system categorises the noise as an Aircraft Noise Event. If there is no match, the uncorrelated Noise Event is categorised as a Community Noise Event. The system also stores data on the noise level below the threshold.

Each Noise Event (Aircraft and Non-Aircraft) has an  $L_{max}$  and an SEL. The SEL of every event is used to calculate the hourly  $L_{eq}$ , and these are used to calculate other metrics such as  $L_{den}$ ,  $L_{night}$ ,  $L_{eq16hr}$  and  $L_{eq8hr}$  over any period at each NMT.

Aircraft Noise includes only correlated Aircraft Noise Events. Total Noise includes Aircraft Noise, Community Noise and the noise not included in any Noise Events, which can include constant low level noise such as distant traffic, wind or tree noise. By definition, Total Noise will always be greater than Aircraft Noise.

ANOMS has a feature that allows the audio replay of Noise Events, but recordings are only stored on the system for 2 weeks. So, while it is possible to listen to recent Noise Events, events from 2022 are unavailable. On listening to recent events, it becomes clear that Uncorrelated, Community Noise Events can include trucks, road traffic, wind, dogs barking, sirens and other unsurprising community activities. Aircraft Noise events replay the sound of an overflight as would be expected.

The reported noise levels in 2022 include the available monitors at the time, namely NMT 1 through 6 and NMT 20 (Oscar Papa).

NMT 1 and 2 are, respectively, near the west and east ends of the South Runway used for most of the time. NMT 20 is further east of NMT2 close to the extended centreline of the South Runway. NMT 3 and 4 are, respectively, west and east of the North Runway opened in August 2022, but usually not used at night. NMT 5 and 6 are north and south of the Cross Runway, which is used infrequently.

Data from NMT 1 and 2 are presented in Figures 36, 37, 43, 44, 50 and 51, showing hourly, monthly, daytime and noise time noise, for both Total and Aircraft Noise. The data is generally consistent with locations near a busy runway, with Aircraft Noise only slightly lower than Total Noise. The noise environment at these locations is dominated by aircraft noise.

Data from NMT 3 and 4 are presented in Figures 38, 39, 45, 46, 52 and 53, showing hourly, monthly, daytime and noise time noise, for both Total and Aircraft Noise. Figure 45 (daytime NMT 3) shows differences between the Total and Aircraft noise of around 8 to 10 decibels. The Aircraft Noise in the last 4 months of 2022, with new daytime NR departures and arrivals over NMT 3, seems to indicate a small increase in Aircraft Noise.

The data for NMT 4 in Figure 46 shows monthly daytime Aircraft Noise levels of around 39 to 50 dBA. Given that NMT 4 in Feltrim is not regularly overflowed, this would appear to be side-on noise from aircraft arriving and departing on the centreline of the South Runway.

The data for NMT 5 and 6 are presented in Figures 40, 41, 47, 48, 54 and 55. As they lie off either end of the least used Cross runway, these locations are like to have the lower levels of Aircraft Noise and the greatest differences with Total Noise.

Figures 47 and 54 appear to contain 2 outlier months in September and October 2022, reporting very high Total Noise levels at NMT 5 (Balcultry) of 75 to 85 dBA both day and night. This may be the data points that triggered the request for an explanation.

An examination of the data stored on the ANOMS system reveals some unusual and very high noise events in those months. Audio recordings are no longer available. The time traces of hundreds of long noise events of 2 minutes and 90 to 100 dBA are not consistent with any regular community, weather or aircraft event.

It is unknown as to what caused these signals. If they were actual community noise events for two months, such events would not go unnoticed by the public. Alternatively, it is possible that they could have been caused by faulty equipment, although nothing is apparent from review of the preventative and reactive maintenance records maintained by our specialist contractor. The noise data returned to normal in November.

## 1.6 Noise Complaint Management Procedure

**Figure 33** illustrates 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 staff. The figure provides the criteria applied in determining whether any complaints, non-compliances, or violations are issued to AirNav Ireland.

Effectively, the NFTMS analyst will analyse the flight in question to determine whether an aircraft has breached the Environmental Noise Corridor. Correspondence with AirNav Ireland will then be initiated, as illustrated on the figure, to determine the details and specific vector information for the flight related to the breach. Receipt of an answer from AirNav Ireland will determine whether further engagement with the relevant airport user is required prior to an official response being issued.

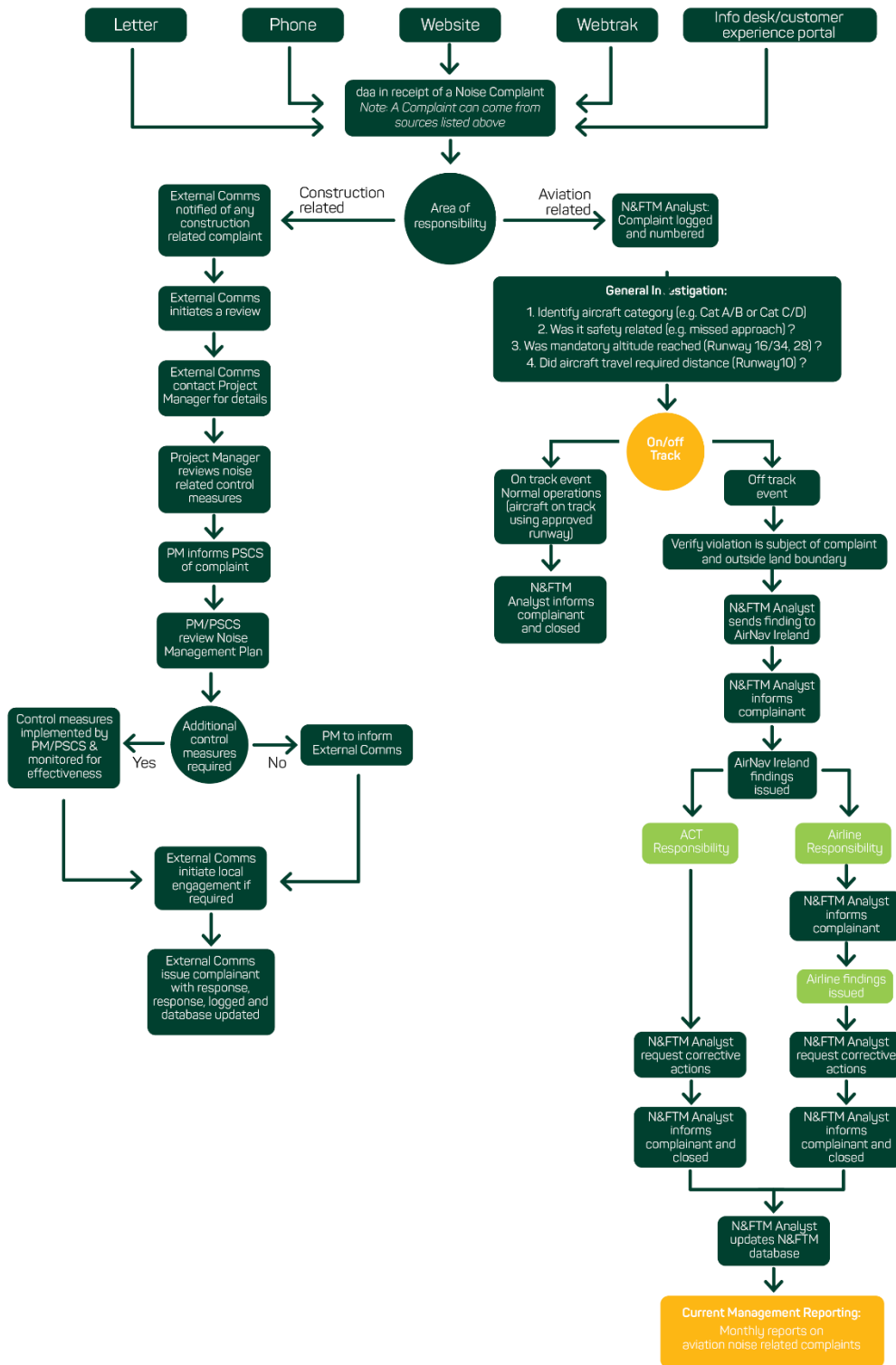


Figure 33 – Noise Management Procedure Flow Chart

2.0

# Traffic Distribution & Management





## 2.0 Traffic Distribution & Management

Several factors contribute to the noise impact around Dublin Airport; these include number of movements, types of aircraft used, runway usage, and route usage. The following subsections provide the statistics and other relevant information for 2022.

### 2.1 Traffic Numbers

In 2022, Dublin Airport facilitated aircraft movements (landing or take-off) that were recorded in the NFTMS.

**Table 5** presents the high-level movements across all Runways excluding helicopters.

Runway Designation	No. of Movements		
	Arrivals	Departures	Total
10	12,125	12,471	24,596
10L	2,271	0	2,271
10R	6,611	9,126	15,737
16	1,376	961	2,337
28	52,759	52,643	105,402
28L	30,018	22,126	52,144
28R	61	7,875	7,936
34	23	15	38

*Table 5 – Runway Usage Statistics*

**Table 6** provides an overview of the runway usage metrics for 2022. The airport is certified to operate 365 days a year, 24 hours per day. In the winter season (November through March) Dublin Airport facilitated between 10,000 and over 17,000 movements per month. In the summer period the airport facilitated between 19,000 and over 20,000 movements per month.



Year	Total	Runway 10	Runway 10%	Runway 10L	Runway 10L (%)	Runway 10R	Runway 10R (%)	Runway 16	Runway 16 (%)	Runway 28	Runway 28 (%)	Runway 28L	Runway 28L (%)	Runway 28R	Runway 28R (%)	Runway 34	Runway 34 (%)	Runway HH	Runway HH (%)	Total
2022	Total	24,596	11.64%	2,271	1.07%	15,737	7.45%	2,337	0.65%	105,402	49.89%	52,144	24.68%	7,936	3.76%	38	0.02%	807	0.28%	211,268
	January	209	0.10%					2	0.00%	10,633	5.03%							65	0.03%	10,909
	February	434	0.21%					454	0.21%	10,556	5.00%					1	0.00%	58	0.03%	11,503
	March	5,352	2.53%					588	0.28%	9,391	4.45%					1	0.00%	60	0.03%	15,392
	April	6,256	2.96%					63	0.03%	12,084	5.72%							74	0.04%	18,477
	May	2,239	1.06%					120	0.06%	17,898	8.47%					1	0.00%	84	0.04%	20,342
	June	4,569	2.16%					4	0.00%	14,923	7.06%					2	0.00%	70	0.03%	19,568
	July	2,208	1.05%					67	0.03%	18,111	8.57%					27	0.01%	69	0.03%	20,482
	August	3,329	1.58%	388	0.18%	2,259	1.07%	65	0.03%	11,806	5.59%	2,479	1.17%	176	0.08%			77	0.04%	20,579
	September			631	0.30%	4,898	2.32%					12,888	6.10%	1,417	0.67%	3	0.00%	86	0.00%	19,923
	October			385	0.18%	4,132	1.96%	73				13,578	6.43%	1,718	0.81%	2	0.00%	59	0.00%	19,947
	November			249	0.12%	1,747	0.83%	771				12,758	6.04%	1,577	0.75%			59	0.00%	17,161
	December			618	0.29%	2,701	1.28%	130				10,441	4.94%	3,048	1.44%	1	0.00%	46	0.00%	16,985

Table 6 – Runway Usage Metrics for 2022

## 2.2 Flight Routes and Destinations

Figures 65 through to 67 provide additional information on traffic movement, routing, and destination. A schedule for the top 30 destinations served to and from Dublin Airport is provided in Appendix D.

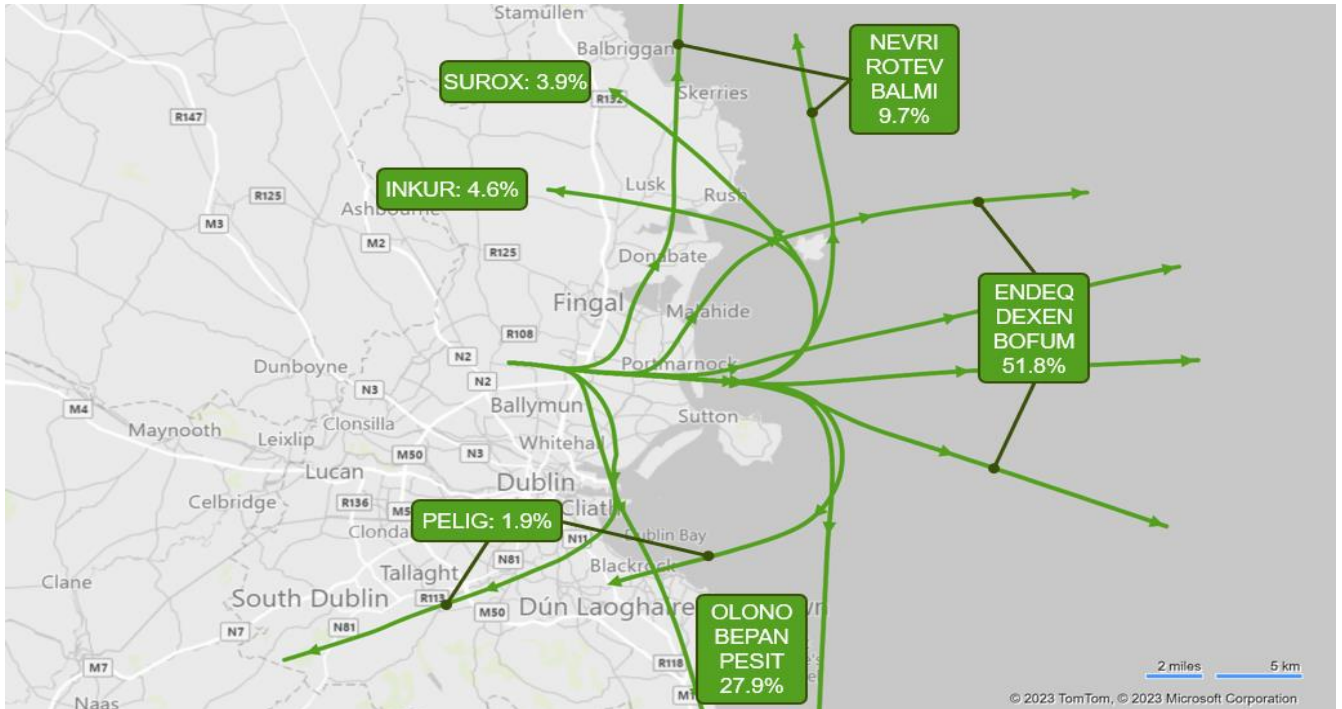


Figure 65 – Runway 10R Departures by SID - SID tracks and percent volume data are illustrations.

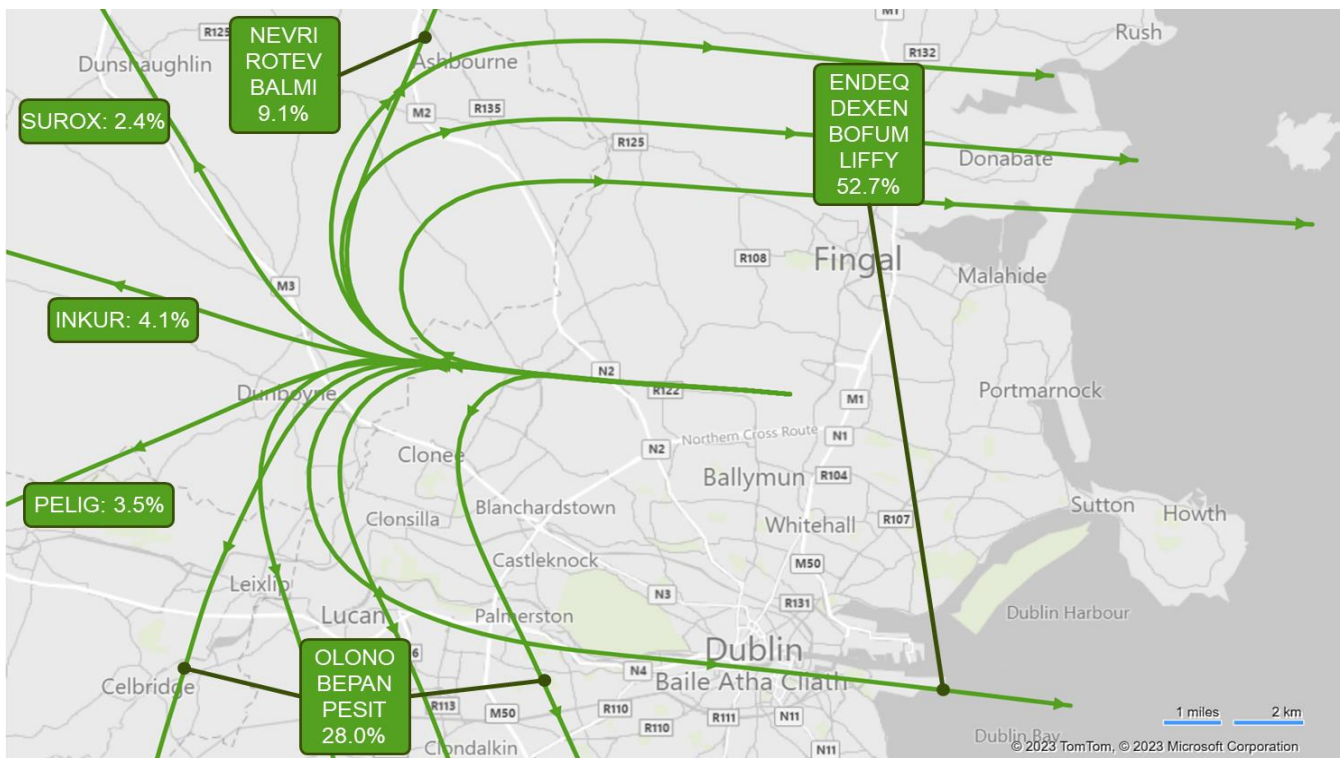


Figure 66 – Runway 28L Departures by SID - SID tracks and percent volume data are illustrations.

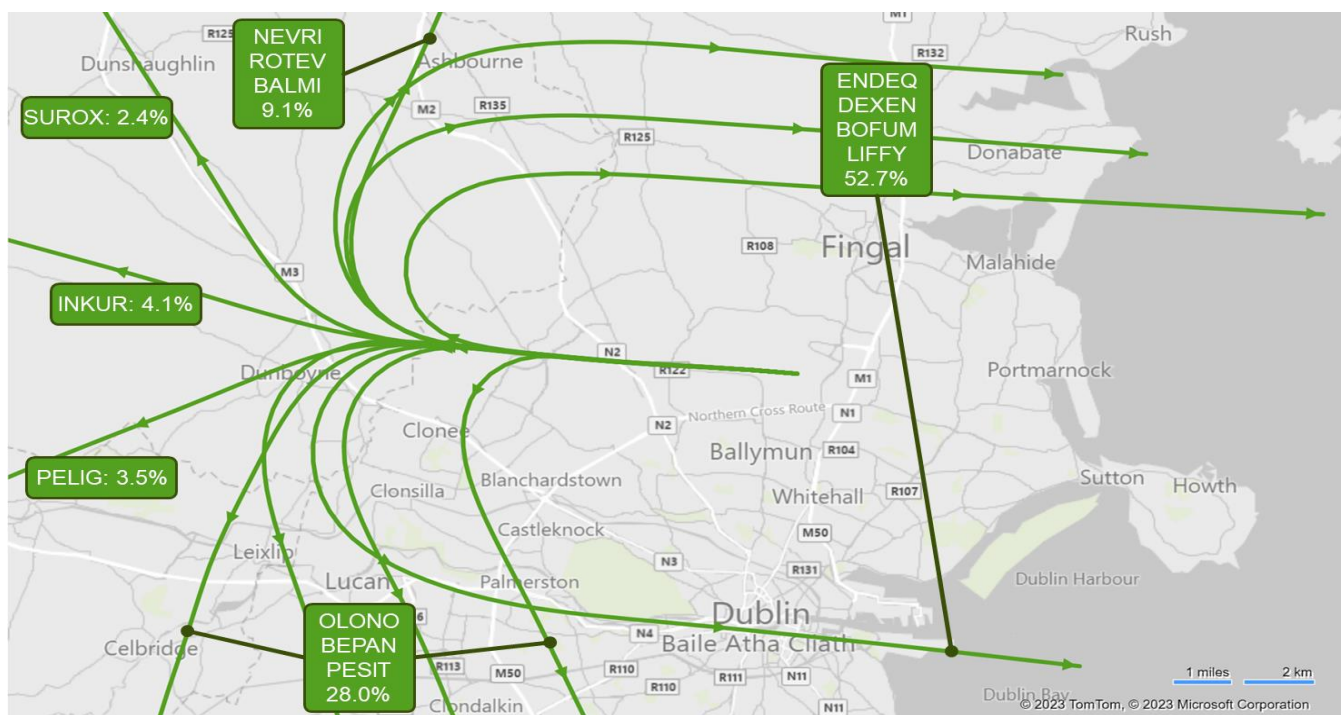


Figure 67 – Runway 28R Departures by SID - SID tracks and percent volume data are illustrations.

The above figures of the report provide diagrammatic representation of the SID tracks and an indication of the distribution of the use of those tracks by departing aircraft during 2022. Further information in terms of the “route statistics between BOFUM/LIFFY/ENDEQ and DEXEN for RW 28L/28R category C/D departures” has been requested.

It should also be noted that during 2022, not only did the North Runway open for operations, the ANOMS system was modified to start keeping data on the tracks used by departing aircraft. As the ANOMS track data is not complete for the year, to answer the information request we have accessed the departure data for the year from the Dublin Airport AOS. While there is never perfect correlation between the ANOMS and AOS, the overall bulk data should be sufficiently accurate.

For departures from both Runway 28L and 28R (Category C/D aircraft), as indicated the figure above, 52.7% used the ENDEQ/DEXEN/BOFUM/LIFFY tracks to destinations to the east.

Of this 52.7%, 84.9% were on the combined BOFUM/LIFFY/ENDEQ and 15.1% were on the DEXEN.

If further breakdown is required, of the 52.7%, BOFUM was 12.6%, ENDEQ was 72.2% and LIFFY 0.2%.

## 2.3 Busiest Day Flight Tracks

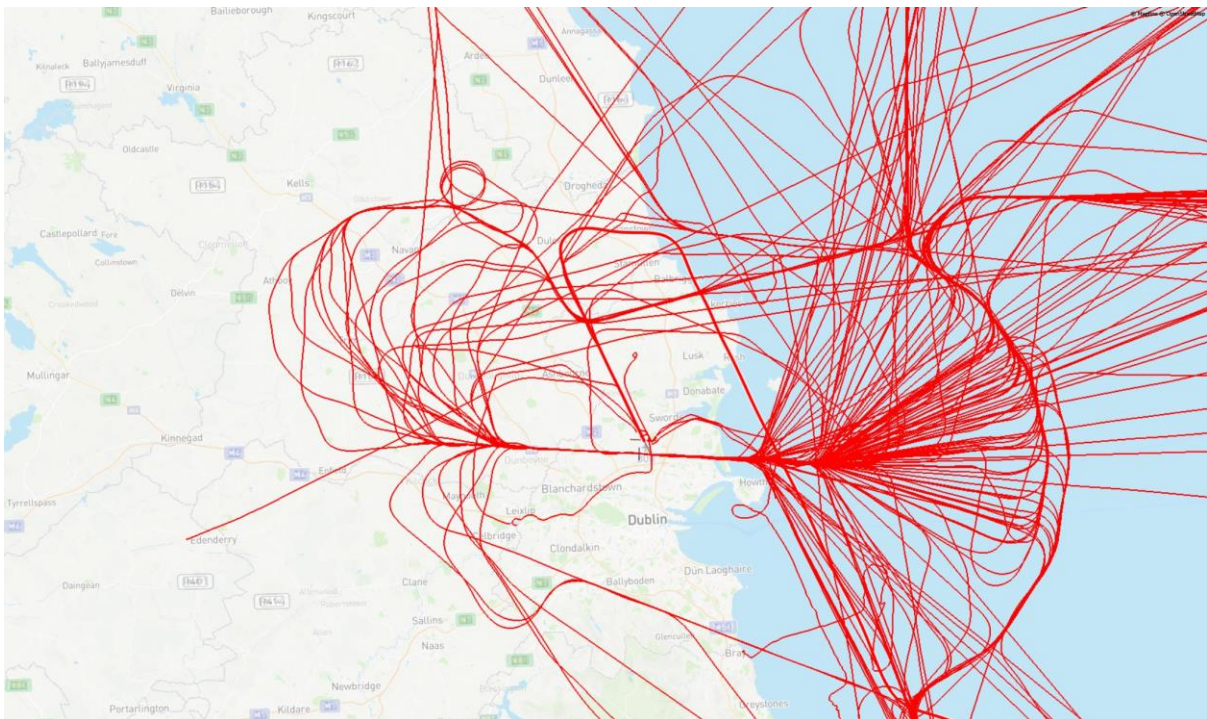
At Dublin Airport, the summer months are typically the busiest. The following were the busiest days in 2022 for both departure and arrival and according to aircraft category.

- Category A/B Arrivals: July 22, 2022
- Category A/B Departures: October 7, 2022



- Category C/D Arrivals on Easterly: September 11, 2022
- Category C/D Arrivals on Westerly: May 27, 2022
- Category C/D Departures on Easterly: September 11, 2022
- Category C/D Arrivals on Westerly: May 27, 2022
- Category C/D busiest day overall: May 27, 2022

**Figures 68** and **69** present screenshots of tracks from ANOMS for Category A/B movements by arrival and departure tracks on July 22 and October 7, respectively. **Figures 70** to **73** present the tracks for Category C/D movements by arrival and departure tracks on each respective busiest day. **Figure 74** highlights movements for the Category C/D aircraft groups on May 27, the busiest day overall.



*Figure 68 – Busiest Day Category A/B Arrivals: July 22, 2022*

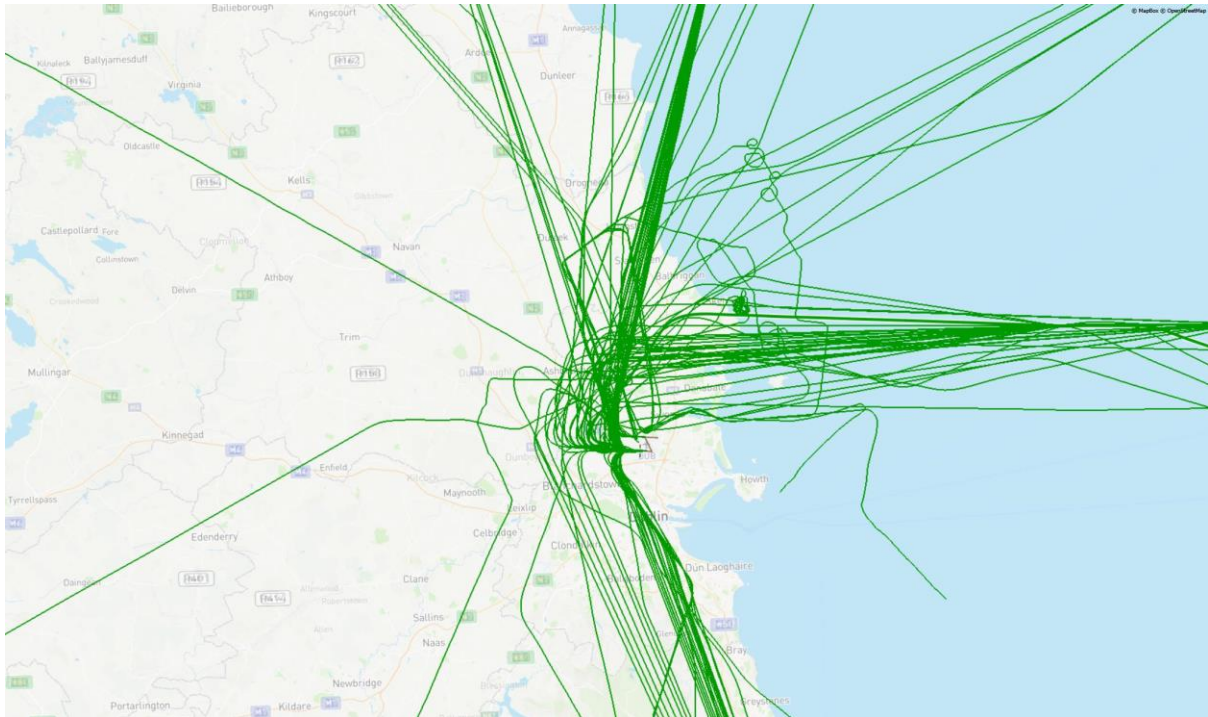


Figure 69 – Busiest Day Category A/B Departures: Oct 7, 2022

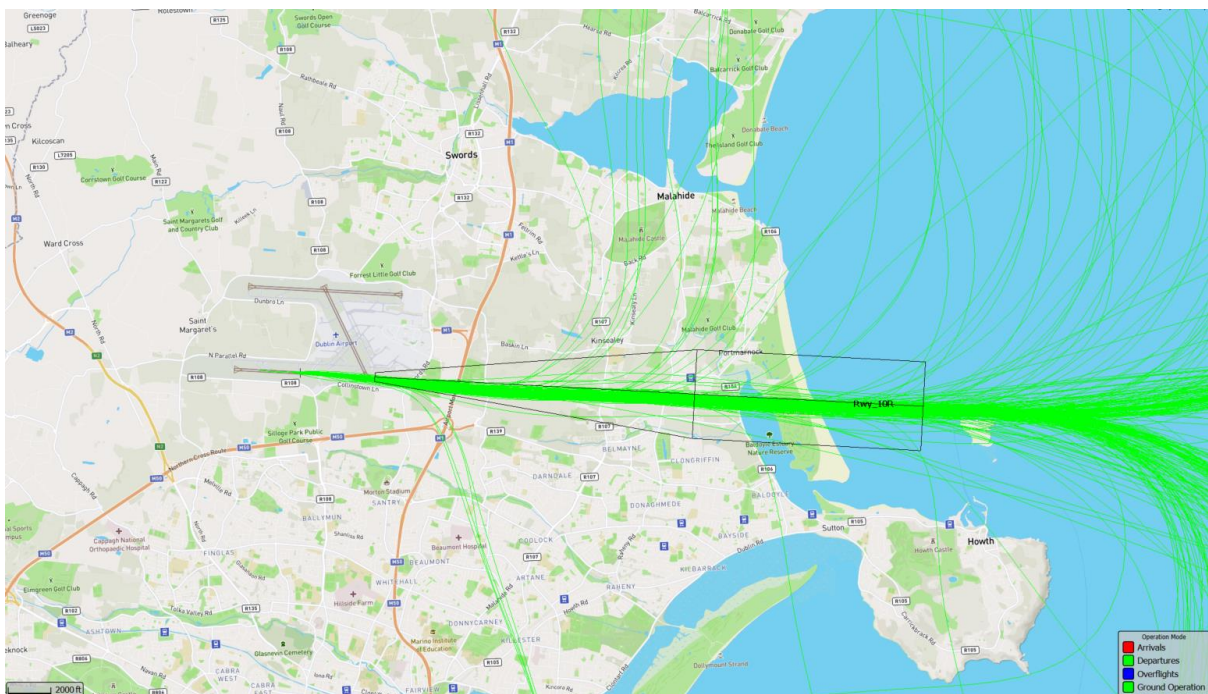


Figure 70 – CAT C/D Busiest Day departures at Dublin Airport on Easterly Operations: Sept 11, 2022



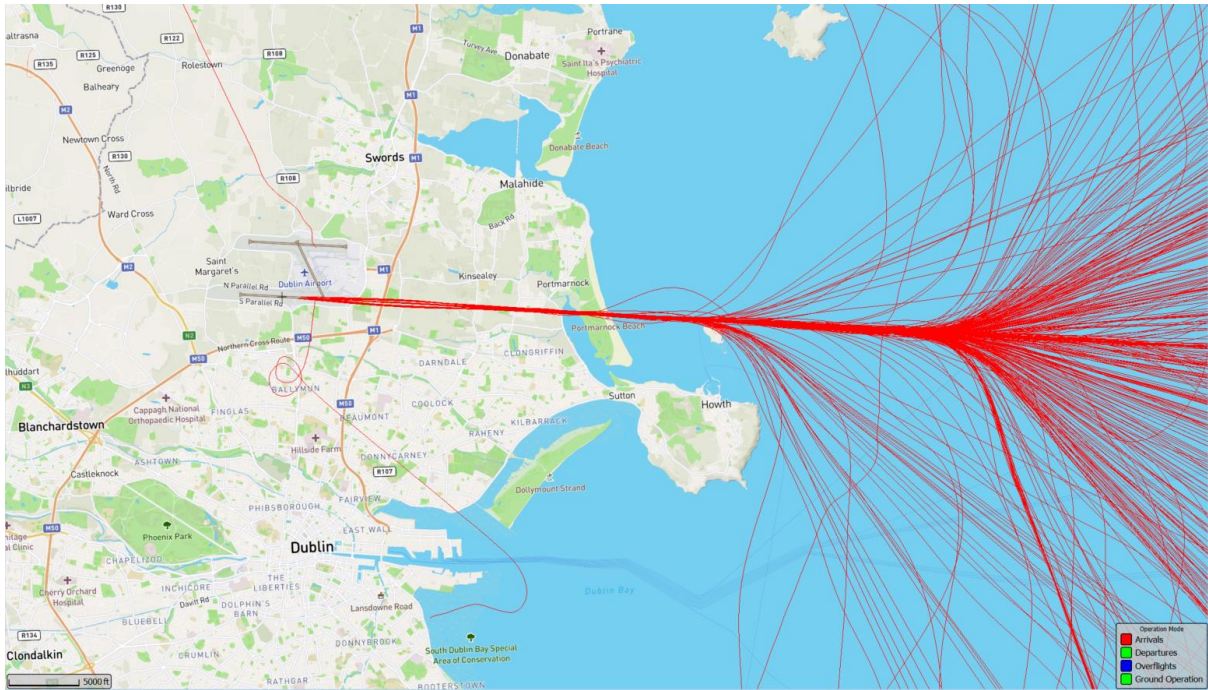


Figure 71 – CAT C/D Busiest Day arrivals at Dublin Airport on Westerly Operations: May 27, 2022

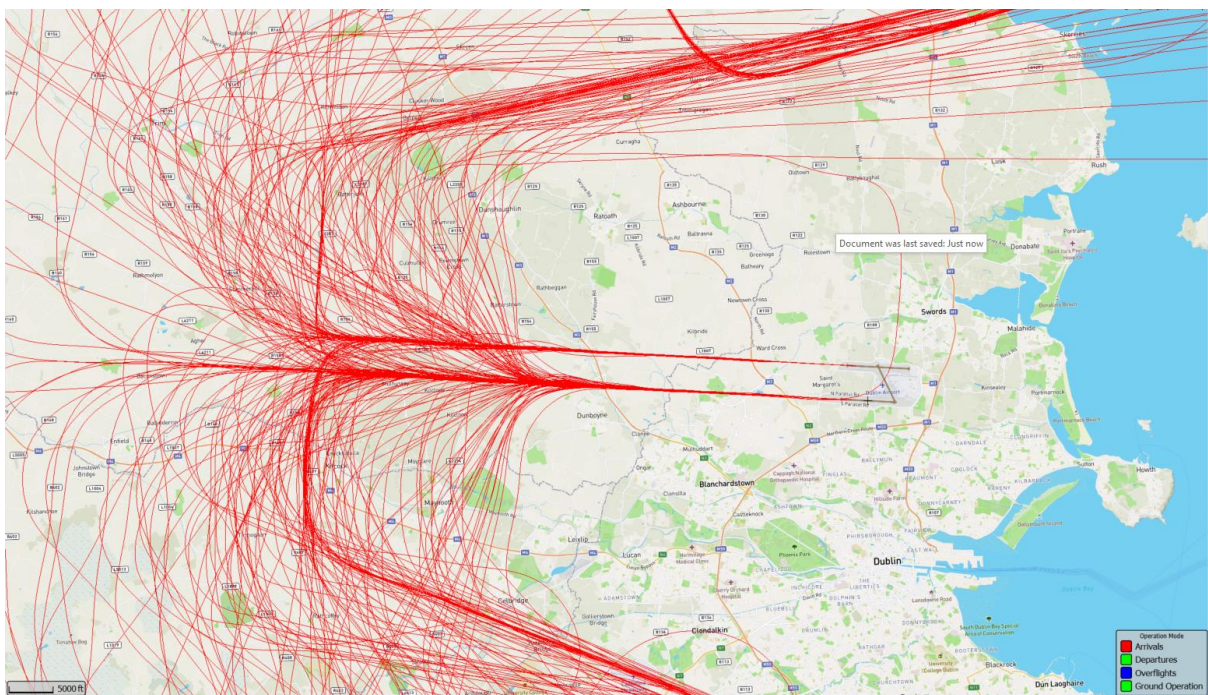


Figure 72 – CAT C/D Busiest Day arrivals at Dublin Airport on Easterly Operations: Sept 11, 2022



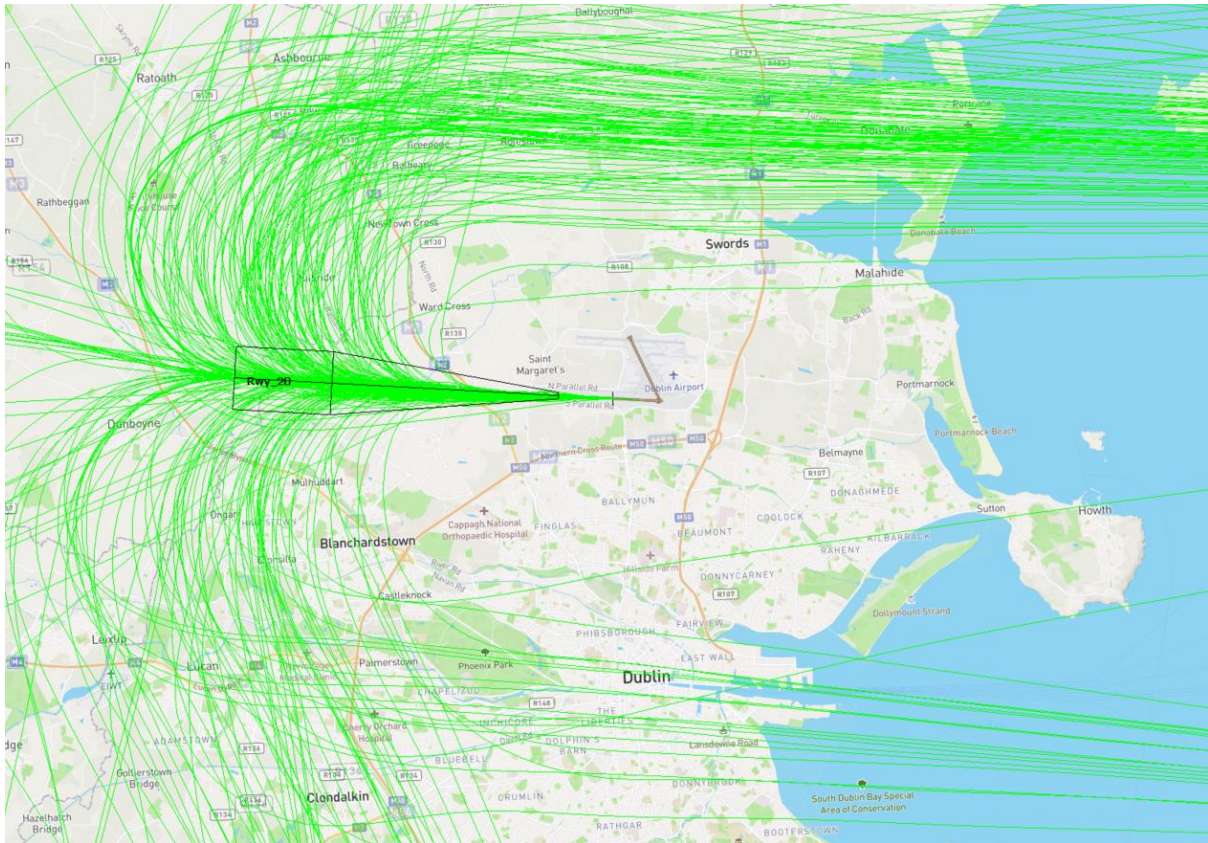


Figure 73 – CAT/C/D Busiest Day departures on Westerly operations: May 27, 2022

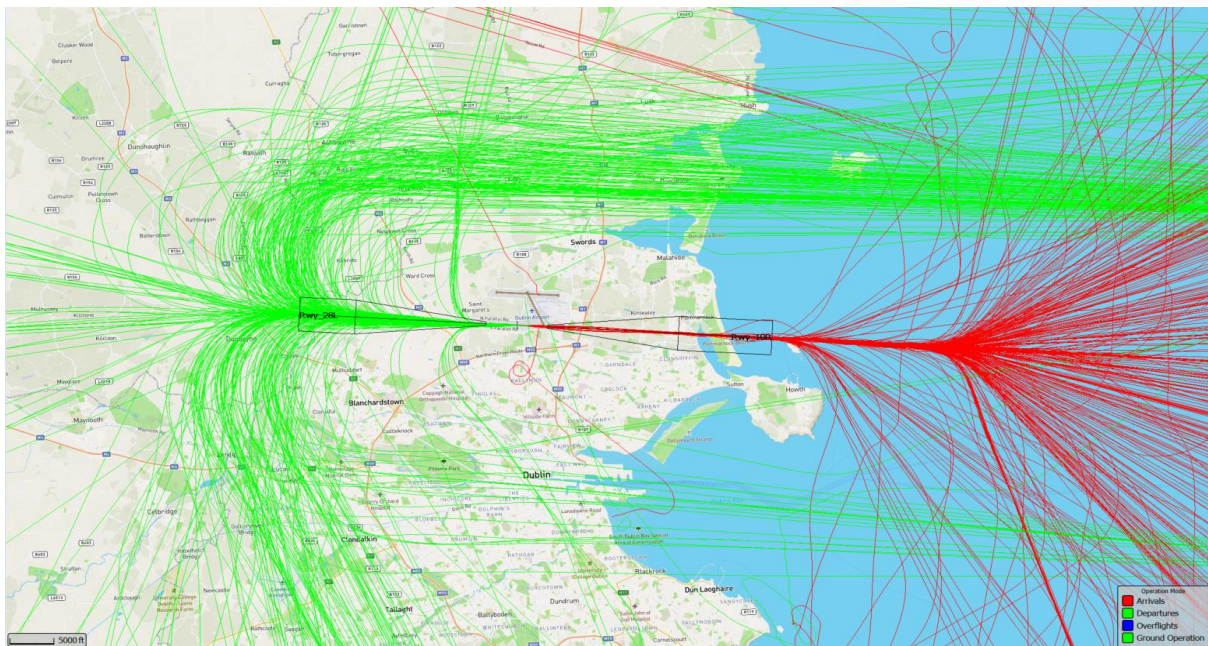


Figure 74 – Tracks of Busiest Day Overall: May 27, 2022

## 2.4 Runway Maintenance

Since the opening of the North Runway (Runway 10L/28R) and in line with planning conditions, switching Runway operations to the Cross Wind Runway (Runway 16/34) to facilitate essential maintenance works on South Runway (Runway 10R/28L) is no longer permissible. In the occasions When essential maintenance

work is required on the South Runway (generally four times per year), the North Runway is used for operations.

**Figure 76** shows the runway layout. The subsections that follow describe the instances when maintenance operations impact Runway usage.

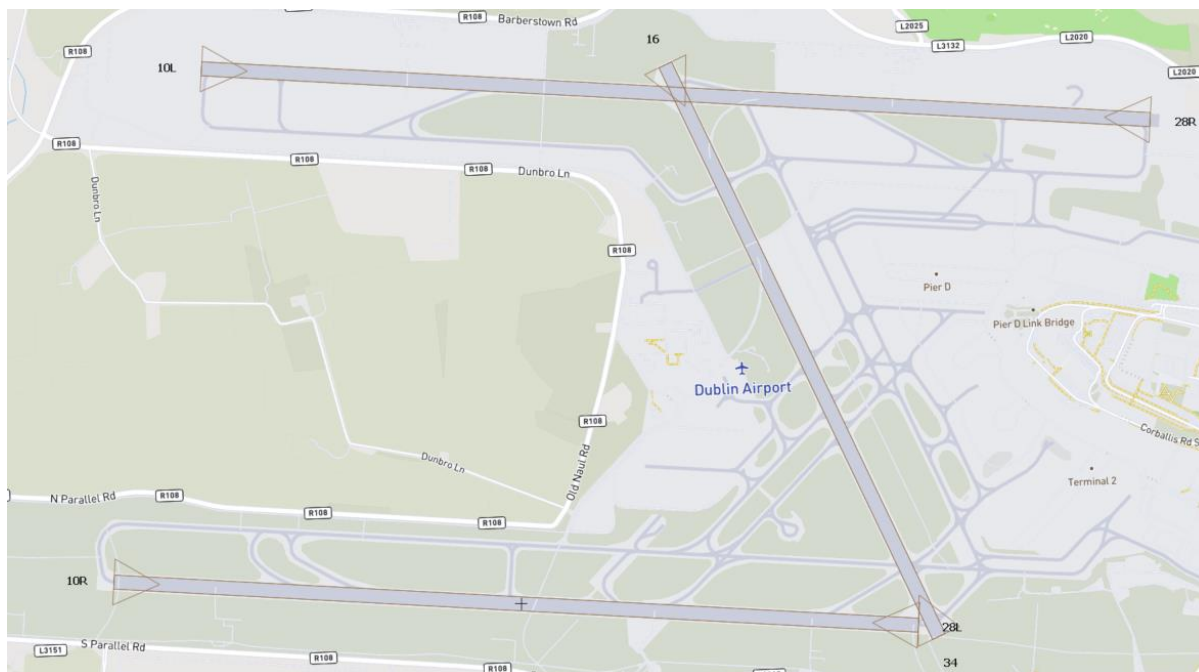


Figure 76 – Runway Layout

## 2.4.1 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 the runway is safe, specialist contractors are engaged to remove this rubber residue using ultra-high pressure washing equipment. This work is carefully planned and was carried out at night-time between 23:00 and 04:30 on four occasions in 2022 to avoid impacting the day-to-day flight operations.

## 2.4.2 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 need 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 strimmer's to maintain the grass areas.

The teams work their way progressively around the airfield cutting the grass around all lights and signs, taking care not to impact the day-to-day operations as they complete their work. Dublin Airport has a long-grass policy that 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 the cutting activities during the night-time hours in coordination with airport operations. These activities took place on four occasions in 2022 between 23:30 and 04:30 for a period of a week.



### 2.4.3 Quarterly Visual Inspection

Dublin Airport staff completed quarterly hourly inspections on Runway 10R/28L during off peak, daytime hours, typically between 14:00 and 15:00 when there is minimal widebody movements. This necessitated the use of Runway 16/34 on those occasions up to August 24,2022 and to the use of North Runway (RWY10L/28R) post August 24,2022.

### 2.4.4 Paint Markings

The visibility of the paint marking for pilots is of paramount importance. These markings deteriorate from wear due to aircraft traffic. Closures to paint the markings were planned to be undertaken concurrently with grass cutting and rubber removal.

### 2.4.5 Pavement and Airfield Ground Lighting Repairs

When conducting pavement repairs on the supporting taxiway to the southern runway, Runway 10R/28L must close. These works are planned to align with the closures for other preventative maintenance works being undertaken on the runway.

## 2.5 Engine Ground Running Data

Section 5 of the AIP discusses engine ground running and provides requirements for both high-power and idle speed runs for five designated test site locations, aircraft stands, and the facilitation of larger aircraft.

daa records engine ground running through its Airside Operations and Safety Officers (AOSOs); the data are compiled in an operations log. In 2022, engine ground running was facilitated at Engine Test Sites 1 and Runway 16/34 for high-power speed runs, while idle speed runs were completed on stand, as required. Operational logging of idle speed test runs is not ordinarily undertaken by the AOSOs. Table 7 compares the 2020, 2021, and 2022 total engine test runs, and Table 8 lists the engine test split by aircraft type. Table 9 presents the duration of the tests performed in 2022.

Location	2020	2021	2022
Test Site 1 (high power)	184	94	98
Runway 16/34 (aircraft larger than code C/B757)	7	4	8
Test Site 4	N/A	2	0
Total	191	100	106

Table 7 – 2020/2021/2022 Comparison – Total Engine Test Runs

Aircraft Type	No. of Test Runs
737	38
738	7
767	1
752	1
A319	1
A320	25
A321	5
ATR72	16
Bombardier	3
787	1

Table 8 – Engine Test Run Split by Aircraft Type (incomplete data for Runway 16/34 data)

Duration of Engine Tests (mins)	No. of Test Runs	Duration of Engine Tests (mins)	No. of Test Runs
>0 – <=5	0	105–110	0
> 5 – <=10	1	110–115	1
10–15	2	115–120	1
15–20	3	120–125	1
20–25	3	125–130	0
25–30	6	130–135	0
30–35	9	135–140	0
35–40	6	140–145	0
40–45	9	145–150	1
45–50	7	150–155	0
50–55	3	155–160	0
55–60	18	160–165	0
60–65	7	165–170	0
65–70	6	170–175	0
70–75	7	175–180	0
75–80	1	180–185	0
80–85	2	185–190	0
85–90	1	190–195	0
90–95	1	195–200	0
95–100	1	200–205	0
100–105	1		

Table 9 – 2022 Engine Test Run Duration \* No engine test runs were performed during night-time hours in 2022.

Analysis of the data shows that there was 84.9% compliance against the AIP that details no engine test running is permitted between 20:00-07:00. 100% compliance with the requirement to complete only CAT C/D testing between 07:00-09:00 CAT C/D was recorded. Three of the sixteen non-compliant engine test runs took place at weekends. Eight engine test runs on RWY 16/34 threshold have no time noted in records.



3.0

# Engagement Forums





## 3.0 Engagement Forums

daa is a neighbour to many communities on whom it depends on to operate Dublin Airport. daa is fully committed to being a responsible airport operator and a good neighbour and understands that a balance needs to be achieved in terms of operating an international airport and honouring the needs of the local communities. That is why daa has a long record of engaging with its neighbours about the issues that are of importance to them, particularly those relating to aviation noise.

### 3.1 Engagement Groups and Channels

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

#### 3.1.1 Community Liaison Group

The independently chaired Community Liaison Group (CLG) was established in 2016 by An Bord Pleanála's North Runway Planning Conditions Decision Condition 28. This condition establishes that a CLG be established, involving representation from the Saint Margaret's Community, Fingal County Council, and daa, with composition of the committee to be decided from prior agreement with the planning authority that aligns with the terms of reference.

The group meets bimonthly to discuss matters of interest to the local community, including current activity and plans 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.

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 representative groups to communicate in an open and transparent manner.

The CLG met on March 8, April 12, May 10, July 12, October 18, and December 6, 2022. Meetings took place both in person and online.

#### 3.1.2 Dublin Airport Environmental Working Group

The independently chaired Dublin Airport Environmental Working Group (DAEWG) was established on July 1, 2005, initially as the "Dublin Airport Stakeholder," and it existed through various iterations until it was renamed in September 2015. This volunteer-based group comprises members from daa, Fingal County Council, AirNav Ireland and members of those local communities impacted by Dublin Airport operations, including Saint Margaret's, The Ward, Santry, Swords, Malahide, and Portmarnock.

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.

The DAEWG met on March 9, June 15, September 21, and November 23, 2022. The group voted for a hybrid model for all meetings in 2022, which meant meetings took place both in person and online.

#### 3.1.3 Other Engagement Channels

In 2022, face-to-face meetings resumed on matters of interest with individual residents and groups. daa also held virtual meetings with individual residents when requested. In addition, daa maintained a fully operated

free phonenumber and several email channels; continued to update websites to provide accurate, current information; provided regular updates to over 1,000 subscribers to the update service; issued relevant information via press releases and social media; and kept local elected representatives apprised of ongoing issues.

## 3.2 Insulation and Purchase Scheme Data

**Table 10** lists the number of residential properties that are eligible for either sound insulation or house purchase, including the number of properties that have benefitted from one of these programmes or schemes. See Appendix B for further information.

Status	Sound Insulation			House Purchase Scheme
	Residential Noise Insulation Scheme (RNIS)	Home Sound Insulation Programme (HSIP)	Voluntary Schools Sound Insulation	Voluntary Dwelling Purchase Scheme
Eligible	125	77	4	38
Benefited/Accepted	105	54	3	10

*Table 10 – Sound Insulation and House Purchase Scheme Details*

4.0

# Operation Restrictions / Flight Procedure Changes

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## 4.0 Operation Restrictions / Flight Procedure Changes

In July 2022 three main operating restrictions came into effect at Dublin Airport. The three noise-related operating restrictions, which are associated with the operations of the north runway planning permission (Conditions 3d, 4, and 5).

These conditions are the following:

- Condition 3(d): Runway 10L-28R shall not be used for take-off or landing between 23:00 and 07:00 Local Time.
- Condition 4: The crosswind runway (Runway 16/34) shall be restricted to essential occasional use on completion of the new runway in accordance with Objective DA03 of the Fingal County Development Plan.
- Condition 5: On completion of construction of the runway hereby permitted, the average number of night-time aircraft movements at the airport shall not exceed 65 per night (between 23:00 and 07:00 Local Time) when measured over the 92-day modelling period.

A review of the Instrument Flight Procedure (IFP) listings schedule (Appendix A) was undertaken with AirNav Ireland and the Safety, Regulation, and Compliance Department at daa. A list of 24 IFP changes completed in 2022 that either became effective within the AIP or were targeted for implementation in 2023 were reviewed (6 of the 24 were scheduled for implementation in 2023). The reasons for change vary from accommodating parallel runway operations to material change updates associated with the Runway 28R/10L. The changes broadly cover CAT A/B, CAT C/D SIDs and STARs and revised instrument approach procedures. Further detail is provided in Appendix A with potential noise impacts and incidents of failures set out.

It was determined that the absence of NPRs appropriate to the changes in flight procedures for Runway 28R/10L did not allow violations monitoring.



# 5.0

## Fleet Mix / Chapter Assessment





## 5.0 Fleet Mix / Chapter Assessment

**Figure 77** shows the distribution of aircraft type groups based on movements across 2021 and 2022. Only aircraft types with more than 200 movements are shown to improve readability. As shown, in both years the B737-800 (B738) and A320 aircraft types were used the most at the airport.

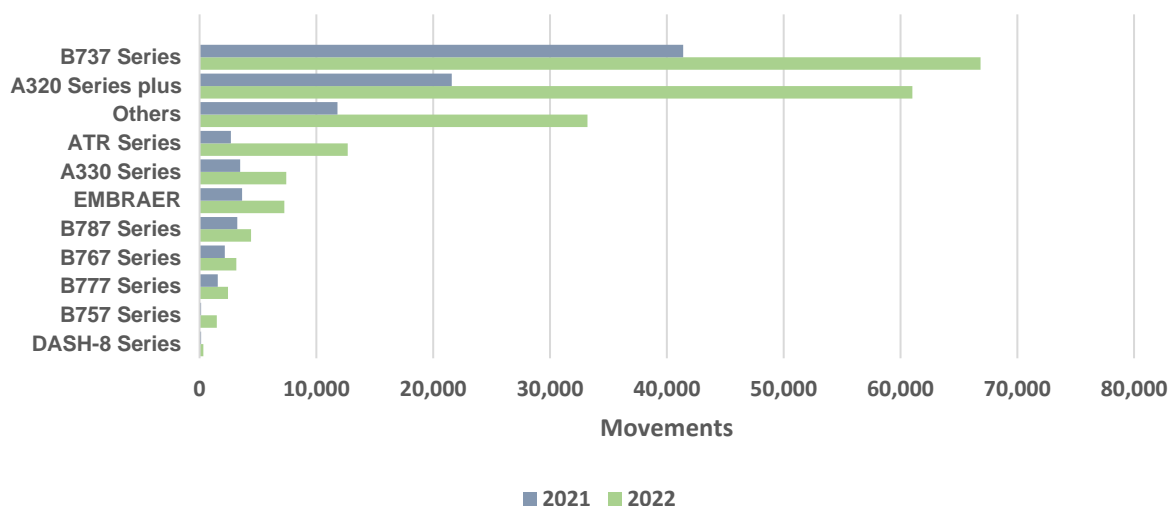


Figure 77 – Aircraft Type and Fleet Mix (2020 versus 2021)

A review was conducted of the schedule of operations for 2021, including the individual movements by aircraft type and registration. This schedule included noise certification data and registered maximum take-off weight (MTOW), as provided by the airport users in the latest Fleet Declaration Forms.

The results of the assessment, and those from the earlier assessments of 2020 and 2021 operations, are presented below in **Tables 11 and 12**. The ICAO Annex 16 - Environmental Protection - Volume I - Aircraft Noise is used to designate the aircraft operating at Dublin Airport and allow reporting by relevant chapter. Of most relevance to Dublin Airport are Chapters 2, 3, 4 and 14 which relate to subsonic jet aircraft and large propeller aircraft (over 8,618 kg). Aircraft of these general types undertake most of the operations at Dublin Airport.

The most recent standard for these aircraft types is given in ICAO Chapter 14, which is applicable to new aeroplane types submitted for certification on or after 31 December 2017, and on or after 31 December 2020 for aircraft less than 55 tonnes in mass. The previous equivalent standards were contained in ICAO Chapter 4 (applicable from 2006), ICAO Chapter 3 (applicable from 1978), and ICAO Chapter 2 (applicable from 1972).

**Table 11** sets out the percentages of the quietest type aircraft in operation at Dublin while **Table 12** provides breakout of the specific aircraft categories and their associated noise chapter. The results show that most of the operations, over 95% in 2022, were by aircraft that meet at least the Chapter 4 standard. Of these, over 32% also meet the more stringent Chapter 14 standard. This is a noticeable improvement on the split in 2021, due in part to the ongoing fleet changes by Ryanair who now have many more of the new Boeing 737 MAX aircraft.

Very few of the operations in 2022 were by aircraft types which only meet the Chapter 3 requirement or are classified as Chapter 3 marginally compliant. Aircraft in these categories have reduced from 0.2% in 2021 to 0.1% in 2022 of the activity in the respective years.

As in 2021, relatively few operations in 2022 were by helicopters or light propeller aircraft. Requirements for these aircraft are given in different ICAO chapters which are not directly comparable.

A small proportion of the operations in 2022 did not have complete data and it was therefore not possible to assess these aircraft. This generally related to movements by business jets which are typically smaller and quieter than the main passenger flights.

Item	2019 (%)	2020 (%)	2021 (%)	2022 (%)
ICAO Noise Chapter Assessment using Certified MTOW	73.8% Chapter 4	71.7% Chapter 4	72.5% Chapter 4	63.9% Chapter 4
	21.8% Chapter 14	22.6% Chapter 14	21.5% Chapter 14	32.4% Chapter 14
	95.6% > Chapter 4	94.3% > Chapter 4	94% > Chapter 4	96.3% > Chapter 4

Table 11 – Chapter Assessment Comparison 2019–2022

Chapter	Percentage of Flights		
	2020	2021	2022
Chapter 3	0.0%	0.0%	0.0%
Chapter 3 Marginal	1.2%	0.2%	0.1%
Chapter 4	71.7%	72.5%	63.9%
Chapter 14	22.6%	21.5%	32.4%
Helicopter and Light Propeller Aircraft	1.9%	2.3%	0.9%
Unknown	2.7%	3.6%	2.7%

Table 12 – International Civil Aviation Organisation Noise Chapter Assessment Results 2019-2022



6.0

# Noise Contours





## 6.0 Noise Contours

Bickerdike Allen Partners (BAP) was retained by daa to produce the noise contours for 2022. The contours produced for Dublin Airport are based on the annual movements using the  $L_{den}$  and  $L_{night}$  metrics. Noise contours were also produced based on the movements in the 92-day summer period (June 16 to September 15) for two metrics, the  $L_{Aeq,16h}$ <sup>6</sup> average daytime metric and  $L_{Aeq,8h}$ <sup>7</sup> average night-time metric.

The individual 2022 noise contours, and comparison with the 2020 and 2021 noise contours, are presented in the figures in this section. Actual aircraft movements in 2022 and noise levels from the Dublin Airport NMTs were used to create the noise contours using a similar methodology to that used to produce the 2019, 2020, and 2021 contours.

**Tables 13 through 16** compare the 2020 and 2021 annual  $L_{den}$  and  $L_{night}$ , and the summer  $L_{Aeq,16h}$  and  $L_{Aeq,8h}$  contour areas, respectively.

All 2022 contours are larger than their 2021 equivalents, due to the increase in movements in 2022, as the airport recovered from the effects of the COVID-19 pandemic. The increase is greater for the summer Daytime  $L_{Aeq,16h}$  and Annual  $L_{den}$  contours.

**Figures 78 and 79** show the 2022 annual  $L_{den}$  and  $L_{night}$  contours, respectively, and **Figures 80 and 81** show the summer daytime and night-time contours, respectively. **Figures 82 and 83** compare the 2020, 2021 and 2022 annual  $L_{den}$  and  $L_{night}$  contours, respectively.

When reviewing the figures, it is evident that the 2022 contours are larger overall than those in 2021 and that there are differences in the shape of the contours between the two years. The contour has grown more all-round but is particularly pronounced to the North and West due to the opening of the new North Runway (10R-28L) in August in 2022.

---

<sup>6</sup>  $L_{Aeq,16h}$  Equivalent average sound level for the 16-hour period between 07:00 – 23:00

<sup>7</sup>  $L_{Aeq,8h}$  Equivalent average sound level for the 8-hour period between 23:00 – 07:00

Metric Value, dB $L_{den}$	Contour Area, km <sup>2</sup>		
	2022	2021	2020
≥ 45	476.3	290.6	237.2
≥ 50	172.1	111	90.3
≥ 55	79.0	45.8	36.5
≥ 60	29.2	16	12.5
≥ 65	9.3	5.6	4.4
≥ 70	3.0	2	1.6
≥ 75	1.0	0.8	0.7

Table 13 – Contour Areas,  $L_{den}$  Metric

Metric Value, dB $L_{night}$	Contour Area, km <sup>2</sup>		
	2022	2021	2020
≥ 40	247.65	172.3	138.7
≥ 45	106.1	75.3	59.8
≥ 50	44.5	28.3	21.7
≥ 55	14.9	9.8	7.5
≥ 60	4.7	3.5	2.7
≥ 65	1.5	1.3	1
≥ 70	0.6	0.6	0.4

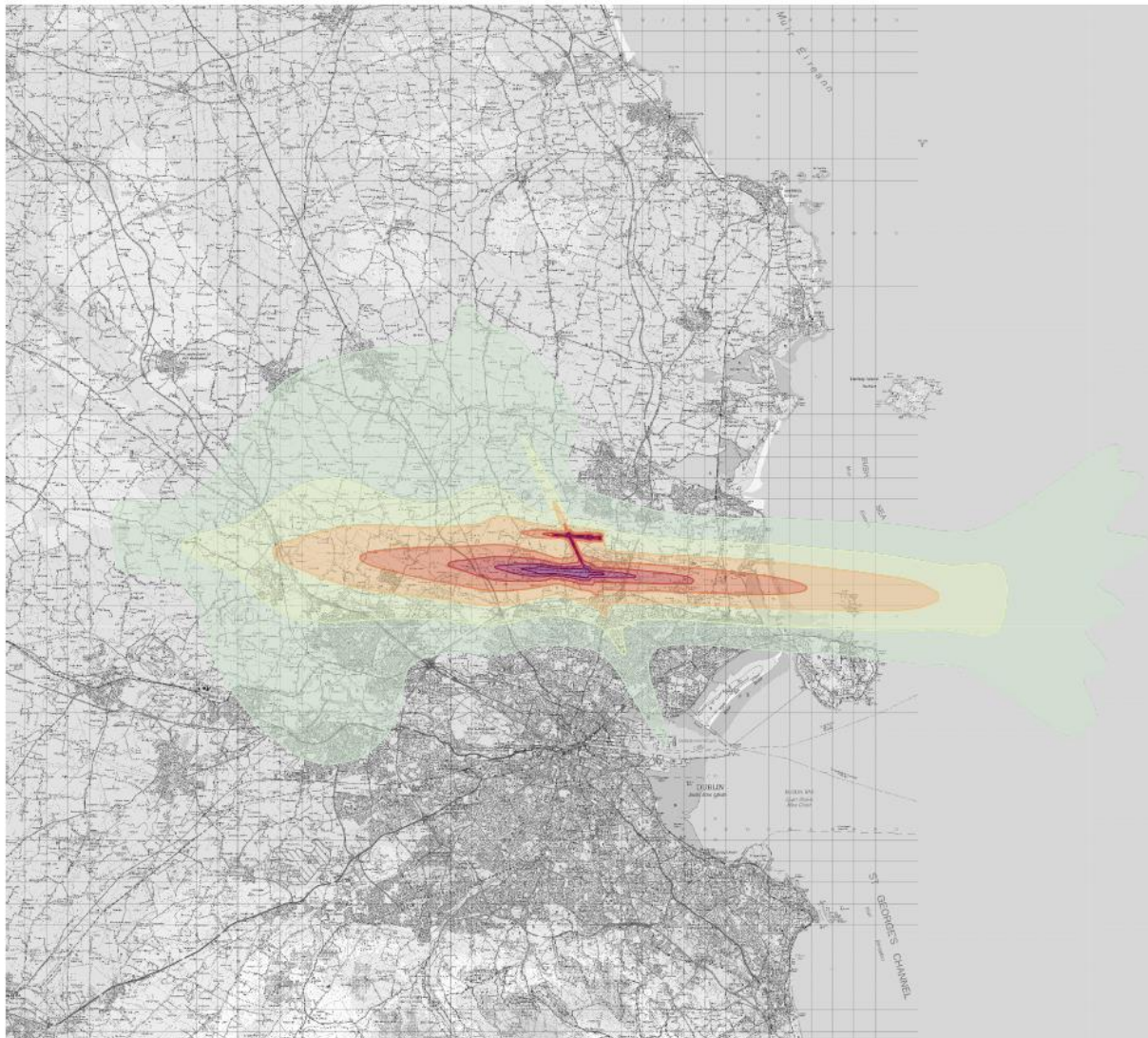
Table 14 – Contour Areas,  $L_{night}$  Metric

Metric Value, dB $L_{Aeq,16h}$	Contour Area, km <sup>2</sup>		
	2022	2021	2020
≥ 51	100.2	55.2	34.2
≥ 54	60.8	30.1	18
≥ 57	32.3	15.8	9.6
≥ 60	16.2	8.5	5.1
≥ 63	8.2	4.5	2.8
≥ 66	4.2	2.5	1.5
≥ 69	2.1	1.4	0.9

Table 15 – Contour Areas,  $L_{Aeq,16h}$  Metric

Metric Value, dB $L_{Aeq,8h}$	Contour Area, km <sup>2</sup>		
	2022	2021	2020
≥ 45	113.1	89.8	66.1
≥ 48	71.1	52.4	37.3
≥ 51	41.2	28.4	19.7
≥ 54	21.6	14.9	10.4
≥ 57	10.7	8	5.5
≥ 60	5.4	4.2	3
≥ 63	2.7	2.3	1.6

Table 16 – Contour Areas,  $L_{Aeq,8h}$  Metric



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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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**Dublin Airport  
Annual Noise Contours**

**Figure 01  
2022 Annual  $L_{den}$  Noise Contours**

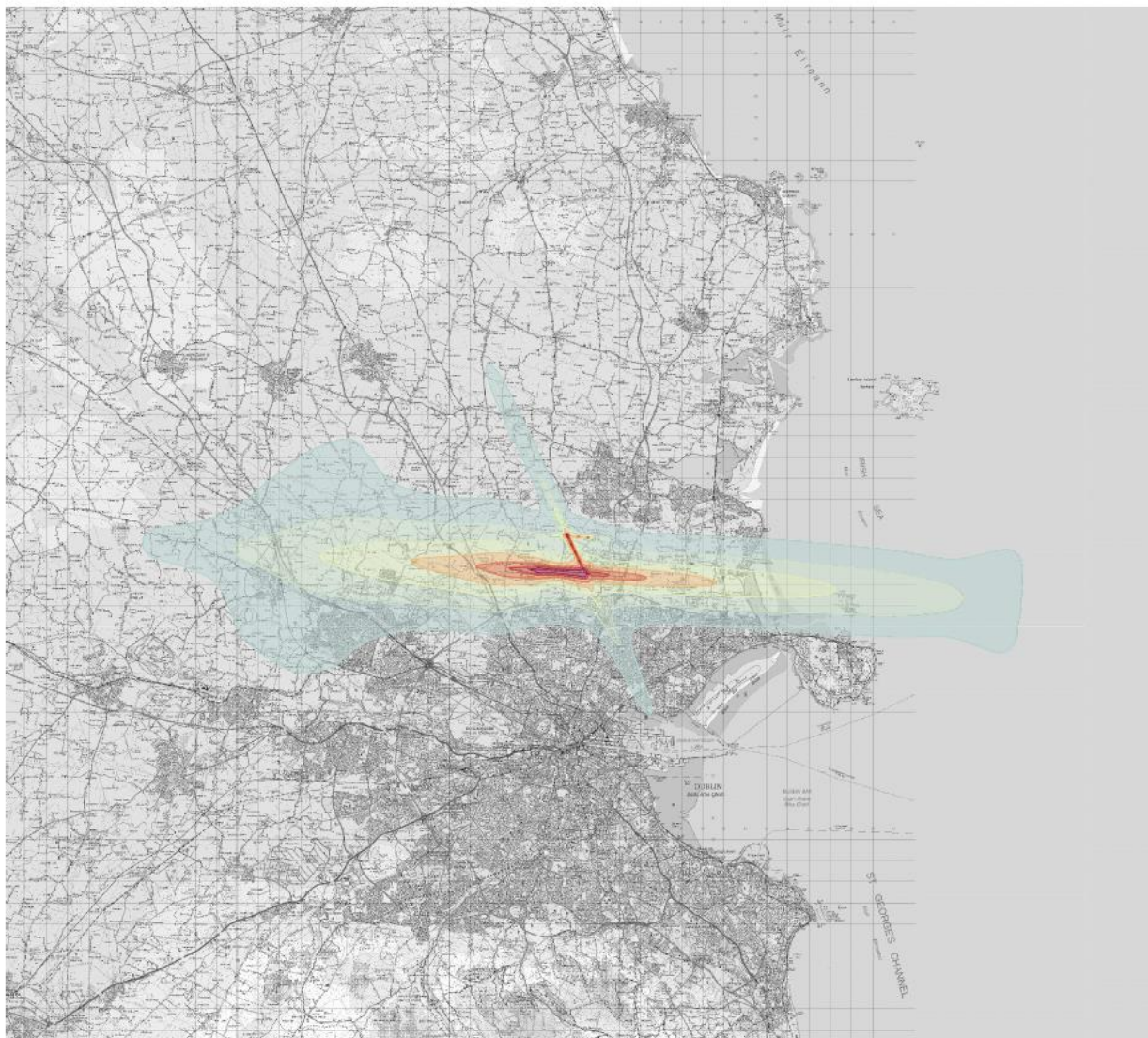
DRAWN: JC CHECKED: NW

DATE: August 2023 SCALE: 1:250000@A4

Drawing No:  
**A11429\_01\_DR015\_1.0**

Figure 78 – 2022 Annual  $L_{den}$  Noise Contours





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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)  $L_{night}$

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**Dublin Airport  
 Annual Noise Contours**

**Figure 02  
 2022 Annual  $L_{night}$  Noise Contours**

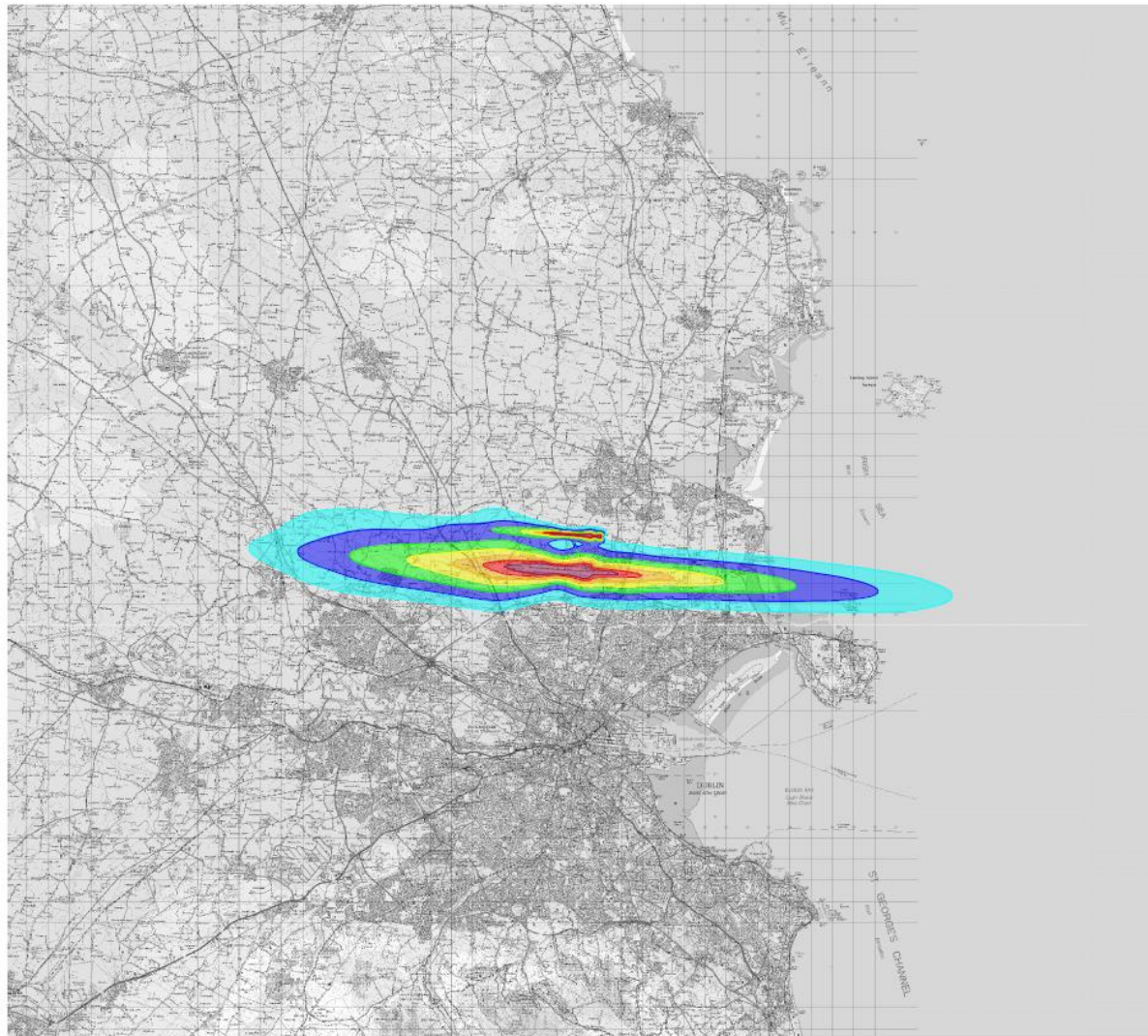
DRAWN: JC CHECKED: NW

DATE: August 2023 SCALE: 1:250000@A4

Drawing No:

A11429\_01\_DR016\_1.0

Figure 79 – 2022 Annual  $L_{night}$  Noise Contours



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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)  $L_{Aeq,16h}$

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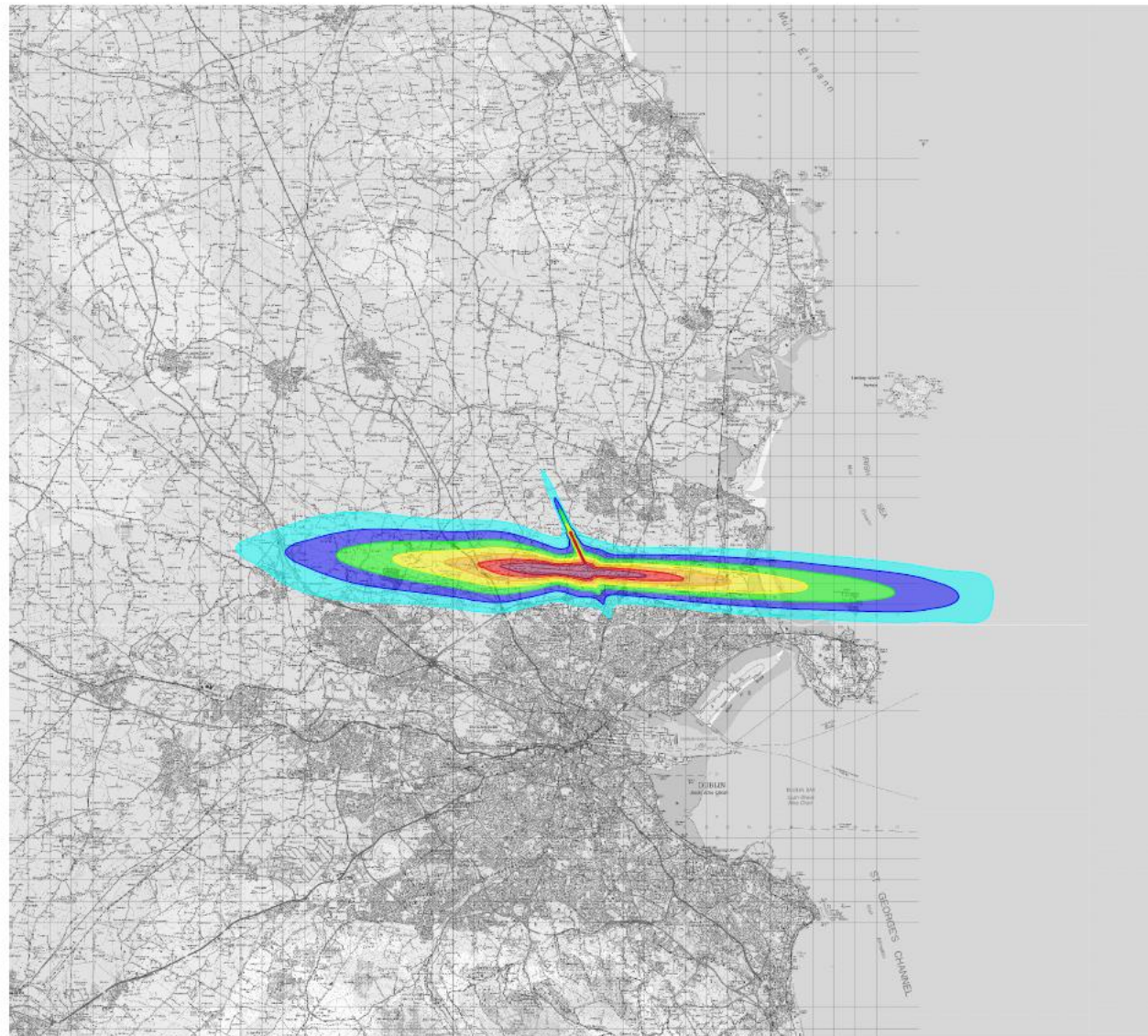
**Dublin Airport  
Annual Noise Contours**

**Figure 03  
2022 Summer Day Noise Contours**

DRAWN: JC	CHECKED: DC
DATE: August 2023	SCALE: 1:250000@A4
Drawing No:	
A11429_01_DR017_1.0	

Figure 80 – 2022 Summer Daytime Noise Contours





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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  
2022 Summer Night Noise Contours**

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DATE: August 2023	SCALE: 1:250000@A4

Drawing No:  
**A11429\_01\_DR0018\_1.0**

Figure 81 – 2022 Summer Night-time Noise Contours

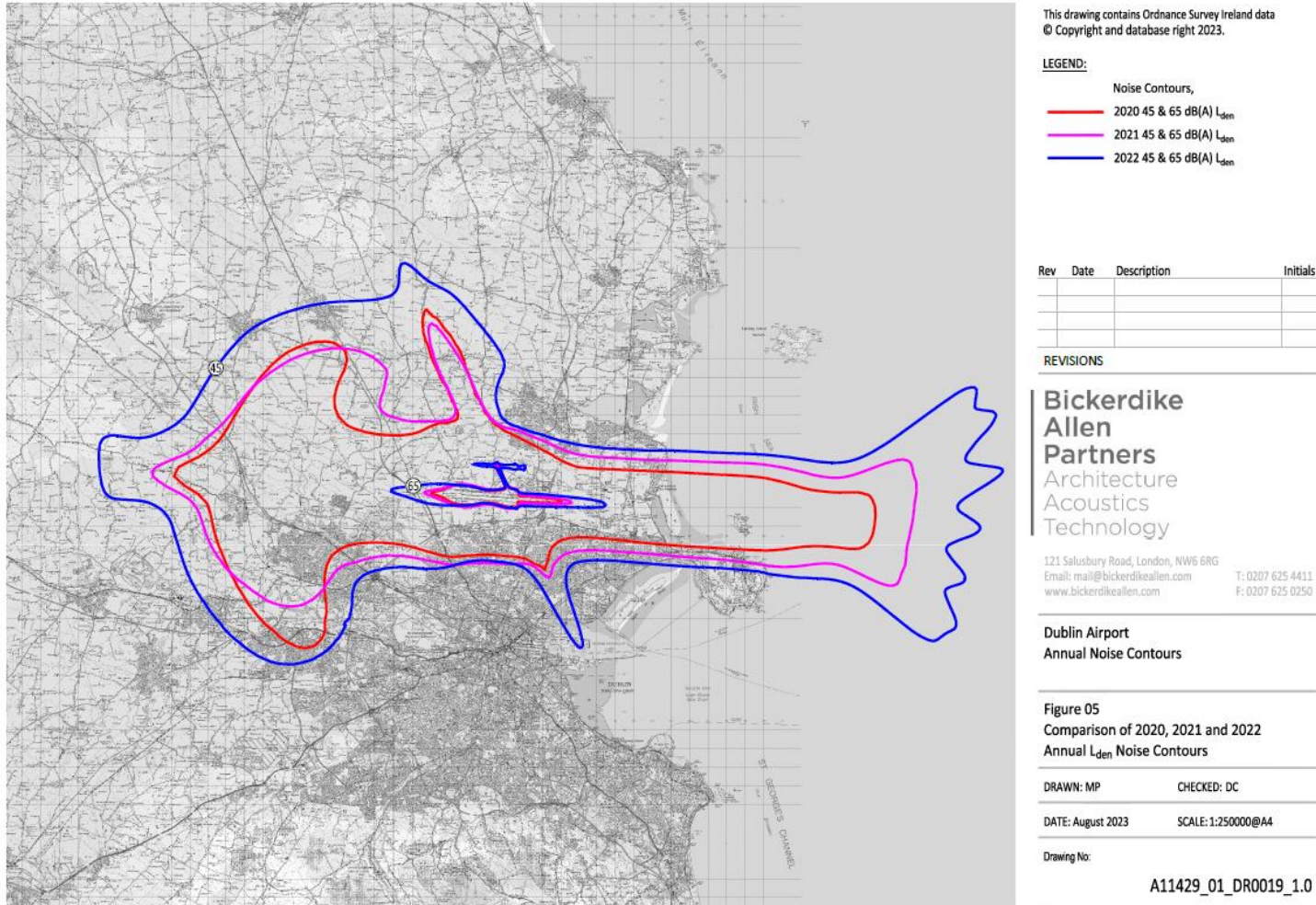
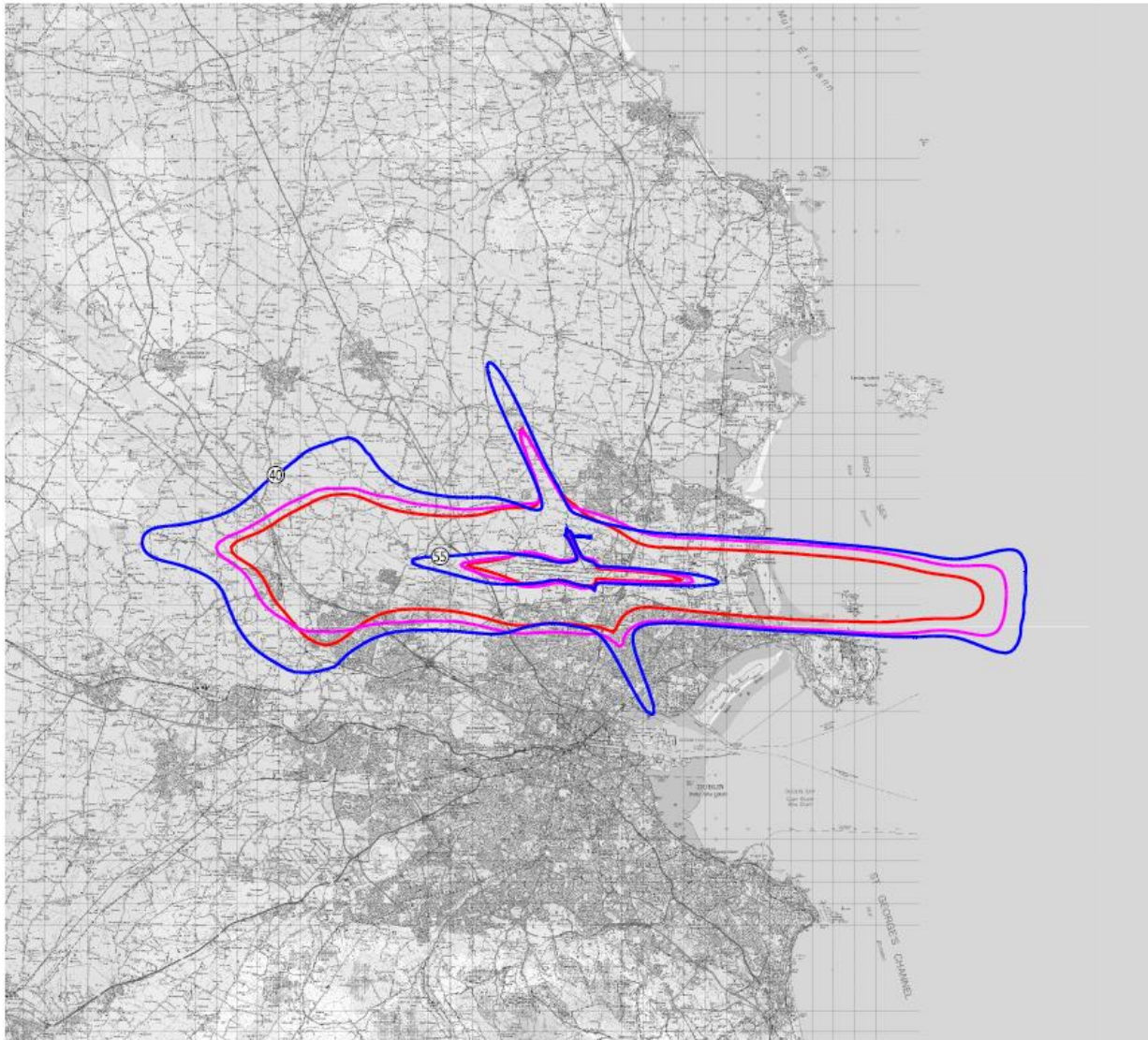


Figure 82 – Comparison of 2020, 2021 and 2022 Annual  $L_{den}$  Noise Contours





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**LEGEND:**

- Noise Contours,  
 — 2020 40 & 55 dB(A)  $L_{night}$   
 — 2021 40 & 55 dB(A)  $L_{night}$   
 — 2022 40 & 55 dB(A)  $L_{night}$


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**Dublin Airport  
 Annual Noise Contours**

**Figure 06  
 Comparison of 2020, 2021 and 2022  
 Annual  $L_{night}$  Noise Contours**

DRAWN: MP CHECKED: DC

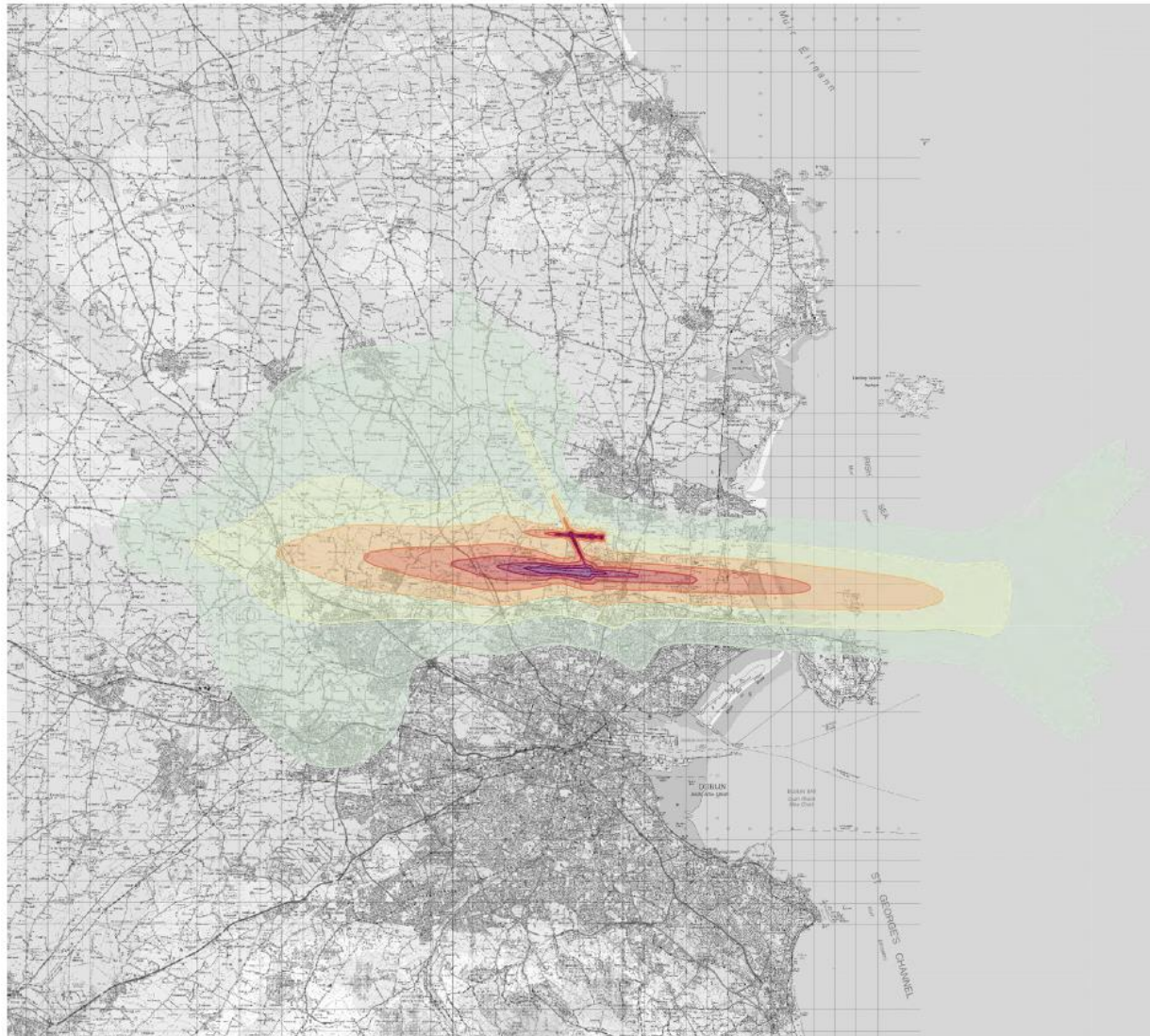
DATE: August 2023 SCALE: 1:250000@A4

Drawing No:

**A11429\_01\_DR020\_1.0**

Figure 83 – Comparison of 2020, 2021 and 2022 Annual  $L_{night}$  Noise Contours





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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)  $L_{den}$

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**Dublin Airport  
 Annual Noise Contours**

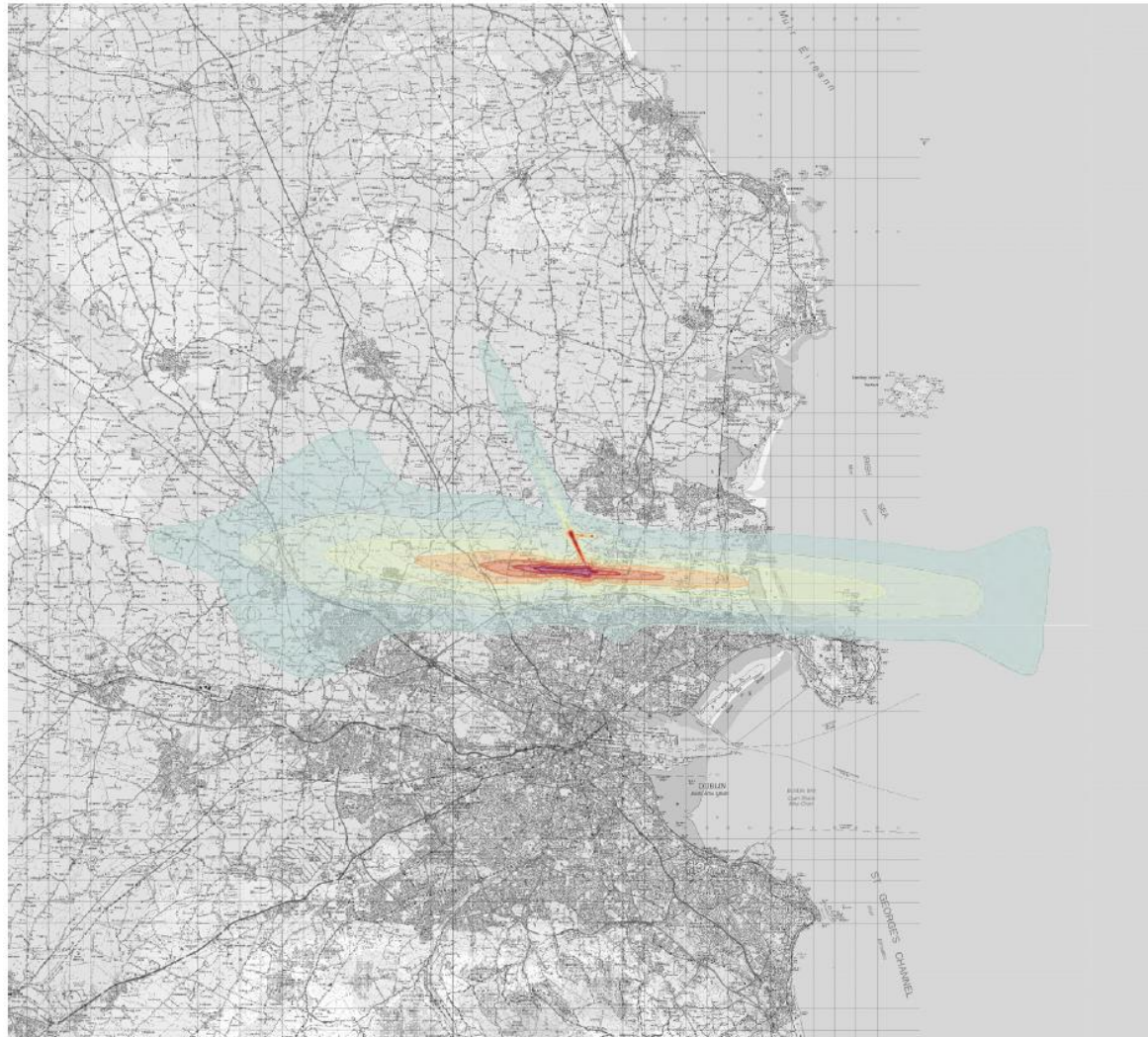
**Figure 01  
 2022 Annual  $L_{den}$  Noise Contours  
 Actual Modal Split**

DRAWN: NW CHECKED: DC

DATE: December 2023 SCALE: 1:250000@A4

Drawing No:  
**A11429\_01\_DR021\_1.0**

Figure 83a – 2022 Annual  $L_{den}$  Noise Contours Actual Modal Split



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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)  $L_{night}$

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**Dublin Airport  
Annual Noise Contours**

**Figure 02  
2022 Annual  $L_{night}$  Noise Contours  
Actual Modal Split**

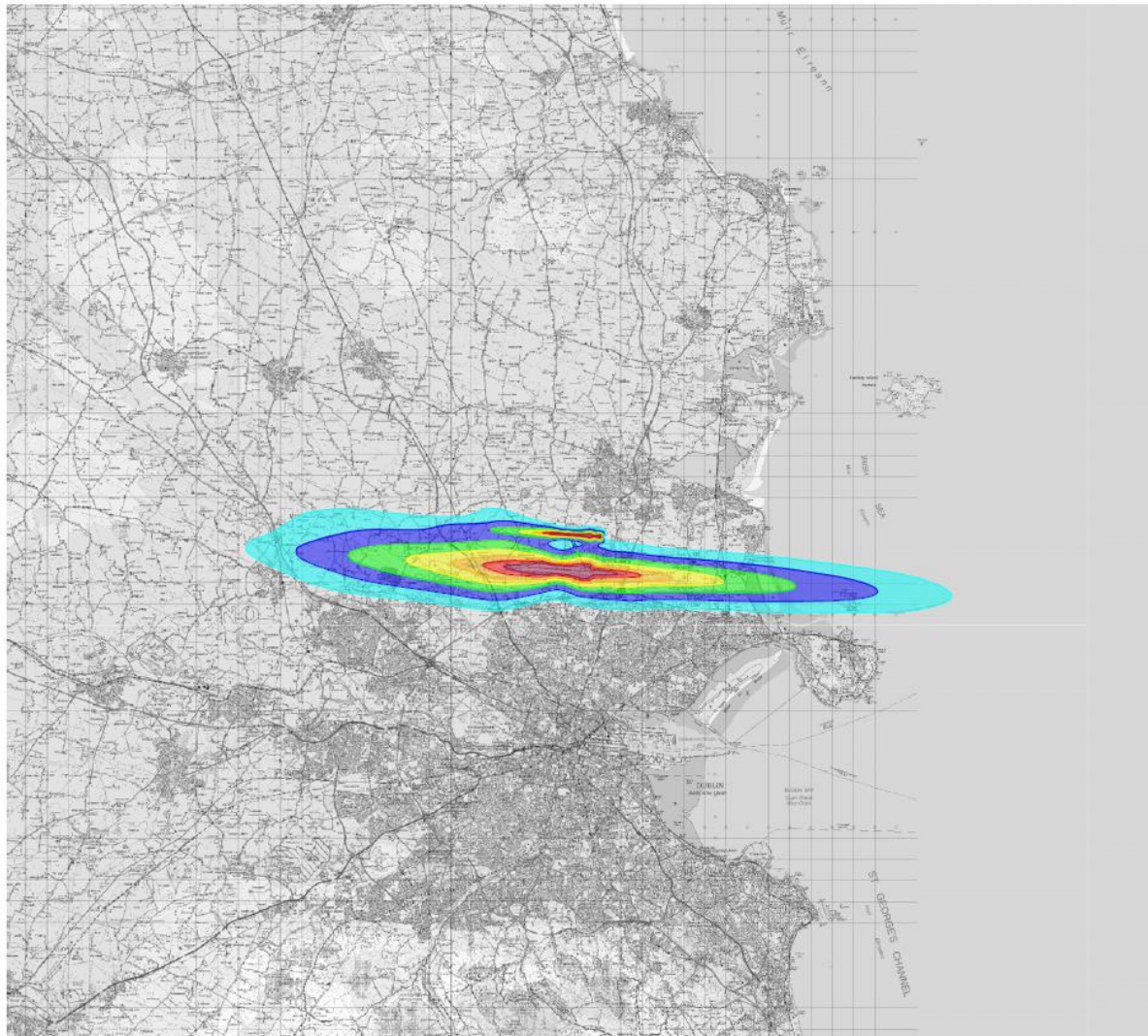
DRAWN: NW CHECKED: DC

DATE: December 2023 SCALE: 1:250000@A4

Drawing No:  
**A11429\_01\_DR022\_1.0**

Figure 83b – 2022 Annual  $L_{night}$  Noise Contours Actual Modal Split





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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)  $L_{Aeq,16h}$

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**Dublin Airport  
Annual Noise Contours**

**Figure 03  
2022 Summer Day Noise Contours  
Actual Modal Split**

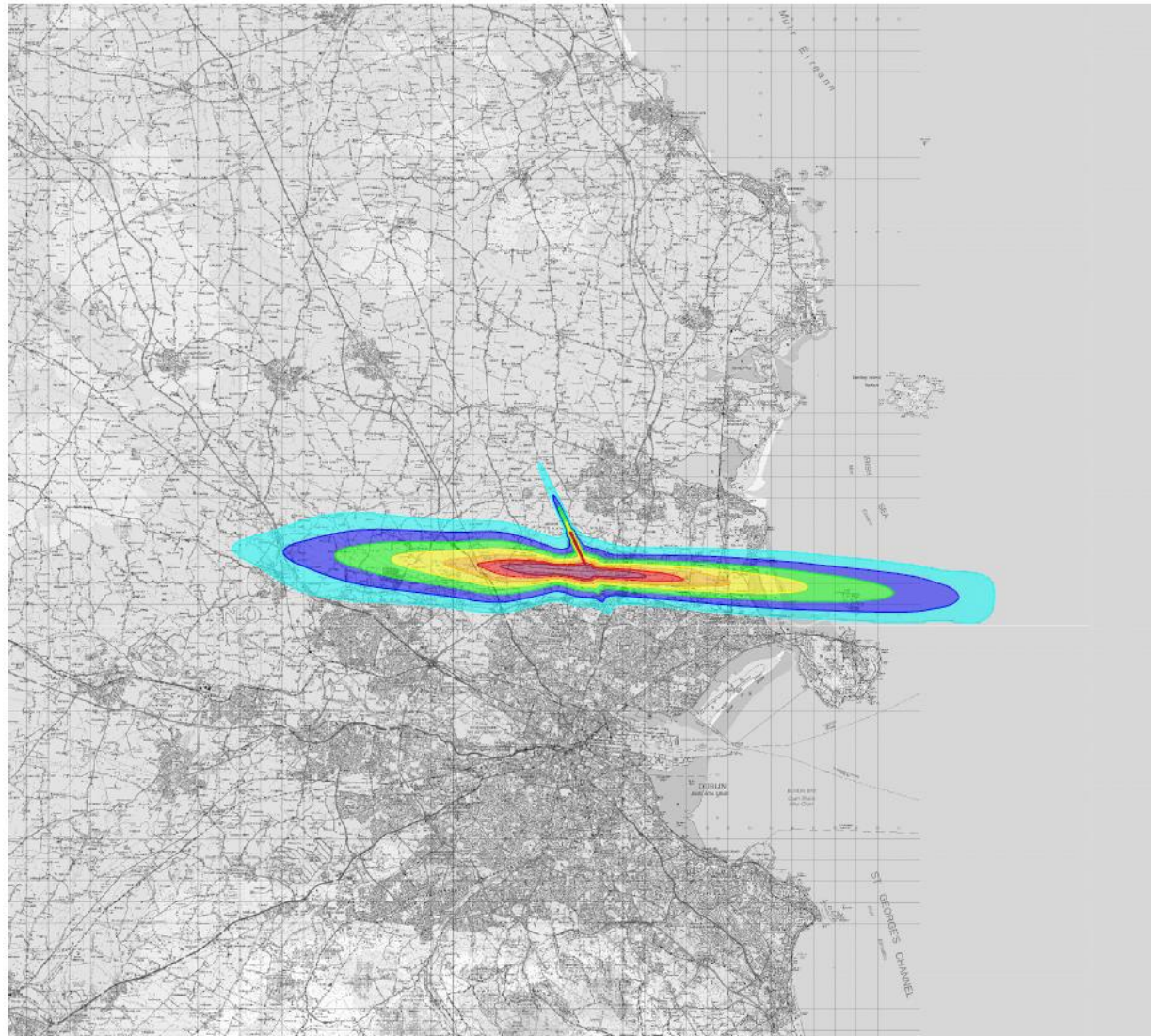
DRAWN: NW CHECKED: DC

DATE: December 2023 SCALE: 1:250000@A4

Drawing No:

A11429\_01\_DR023\_1.0

Figure 83c – 2022 Summer Daytime Noise Contours Actual Modal Split



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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)  $L_{Aeq,8h}$

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Dublin Airport  
 Annual Noise Contours

Figure 04  
 2022 Summer Night Noise Contours  
 Actual Modal Split

DRAWN: NW CHECKED: DC

DATE: December 2023 SCALE: 1:250000@A4

Drawing No:

A11429\_01\_DR0024\_1.0

Figure 83d – 2022 Summer Night-time Noise Contours Actual Modal Split

## 6.1 Contour Map – Busiest Day Overlays

**Figures 84 through 91** show the 2022 Summer Day  $L_{Aeq, 16h}$  and Summer Night  $L_{Aeq, 8h}$ , aircraft noise contours plotted separately with the flight tracks for the typical busiest days on both Easterly and Westerly operations. Arrival tracks are coloured red and departure tracks are green.

Note that the new North Runway is not used during the night-time 23:00 - 07:00.

**Figures 92 and 93** show the 2022 Annual  $L_{den}$  and  $L_{night}$  aircraft noise contours plotted with the arrival and departure flight tracks for the typical busiest days on the predominant Westerly operations.

The distribution of aircraft operations can be seen to be related directly to the calculated noise contours.





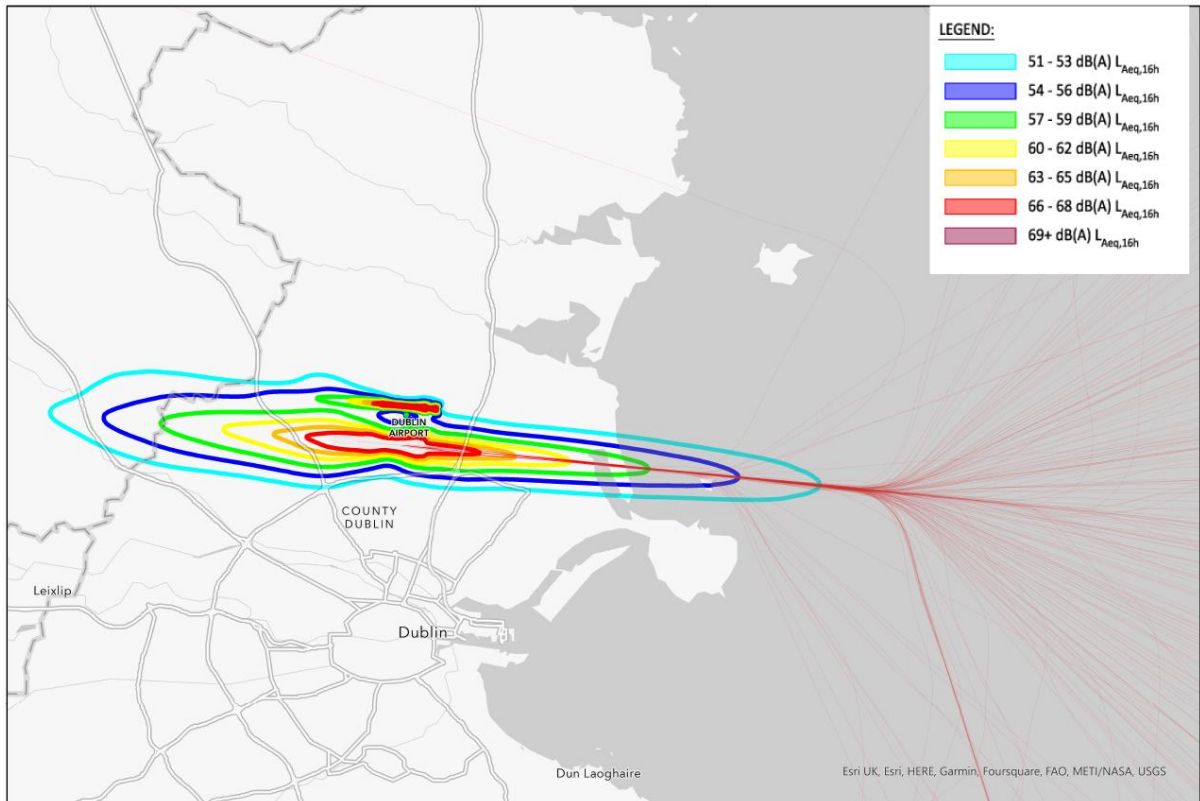


Figure 86 – Busiest Day Arrivals on Westerly and Summer Day contour

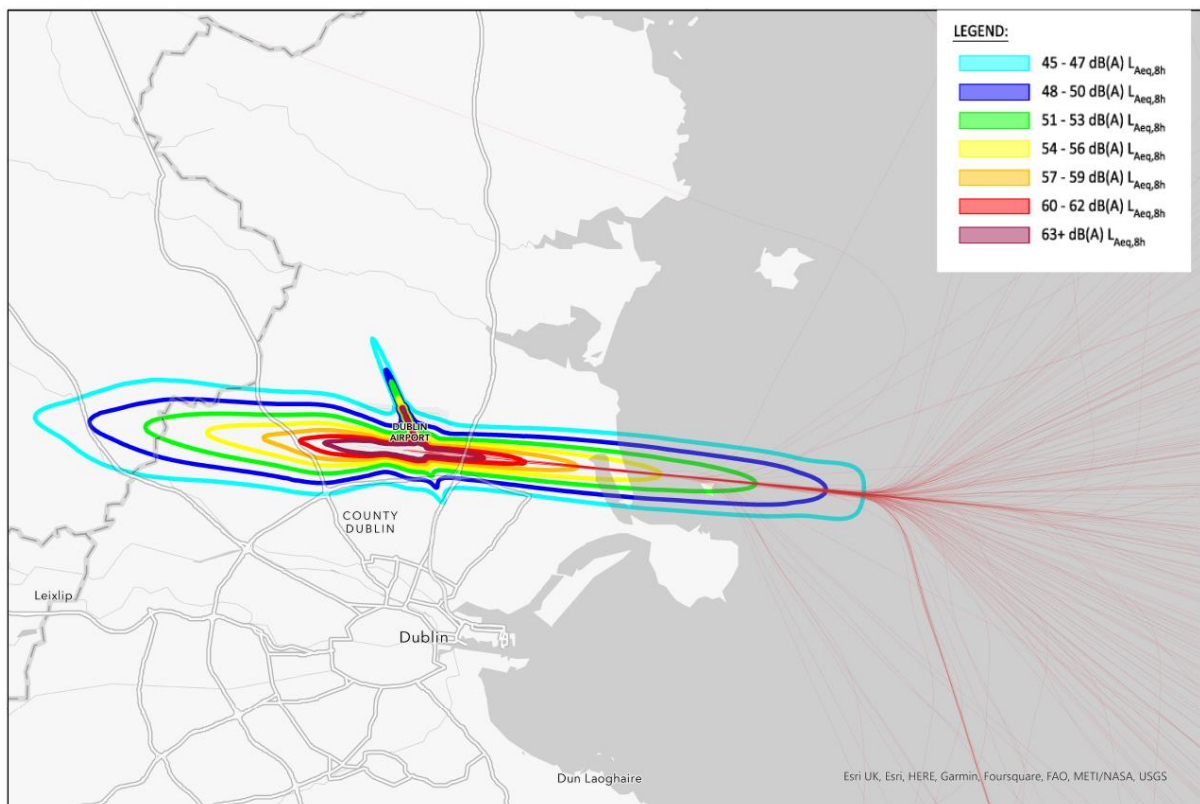


Figure 87 – Busiest Day Arrivals on Westerly and Summer Night contour



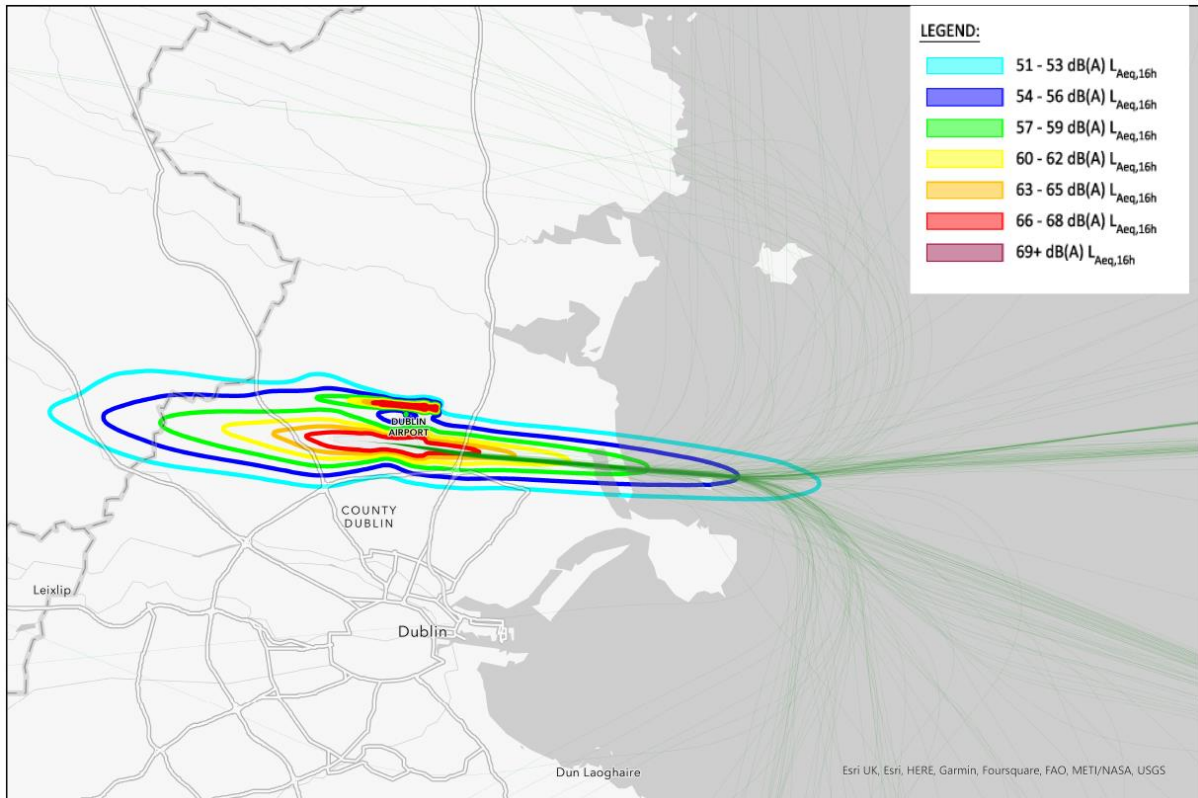


Figure 88 – Busiest Day Departures on Easterly and Summer Day contour

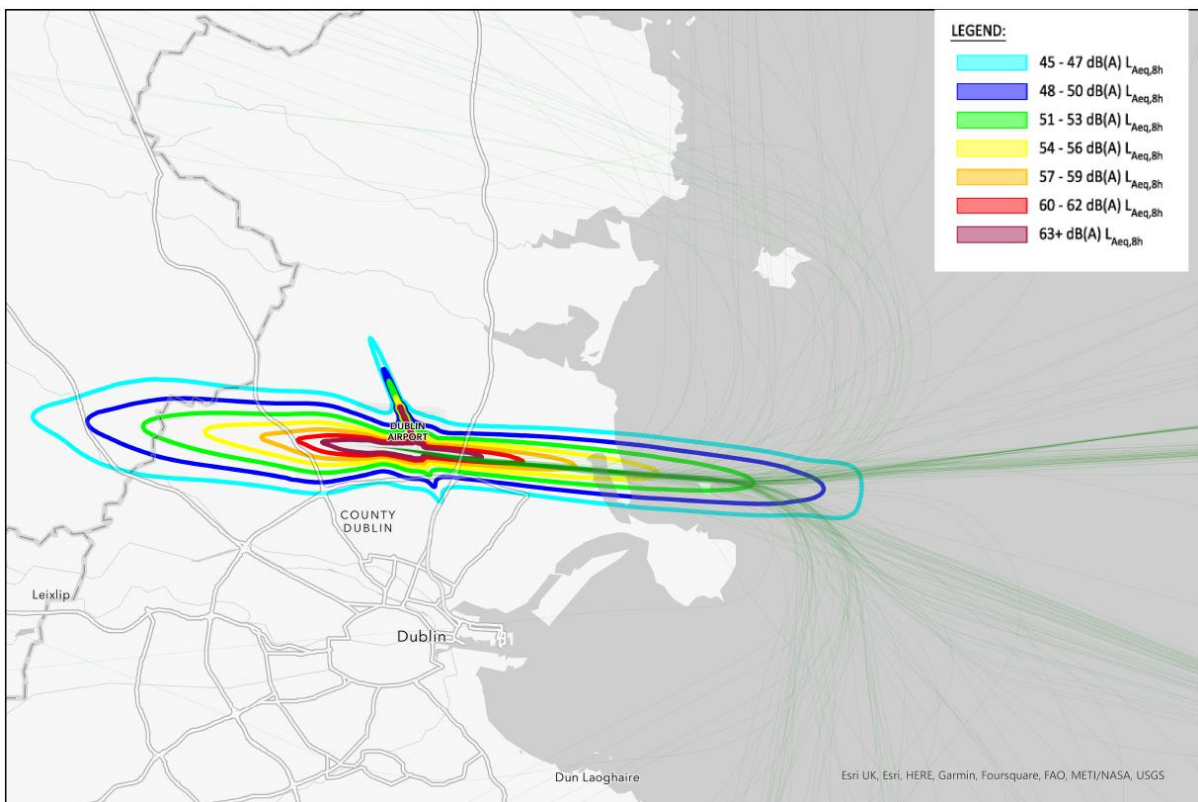


Figure 89 – Busiest Day Departures on Easterly and Summer Night contour

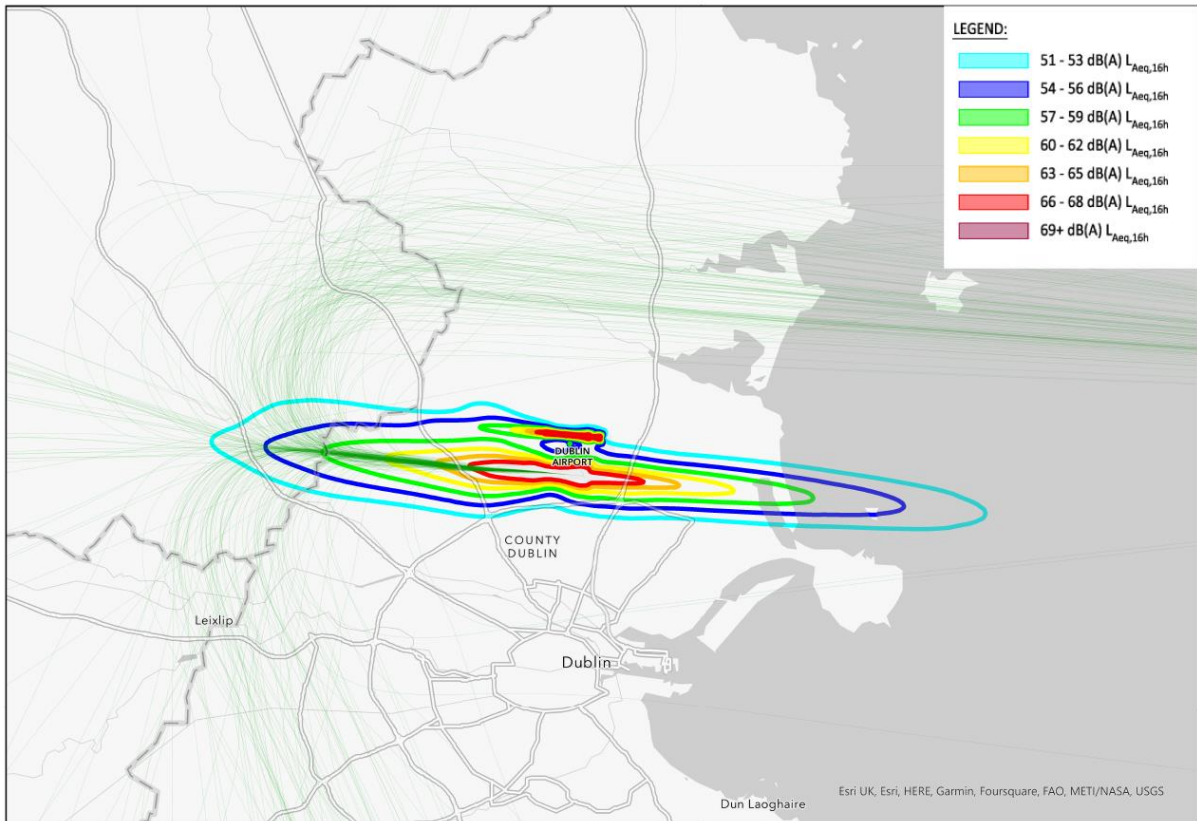


Figure 90 – Busiest Day Departures on Westerly and Summer Day contour

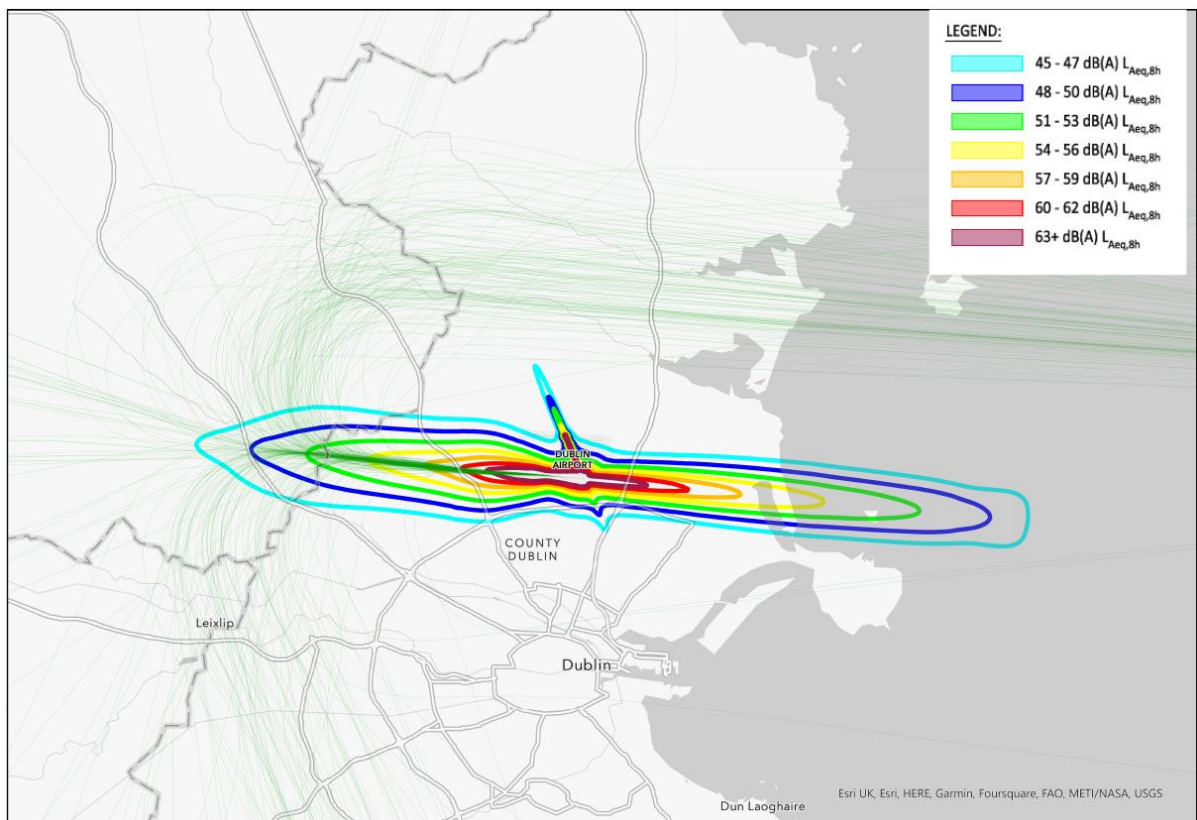


Figure 91 – Busiest Day Departures on Westerly and Summer Night contour



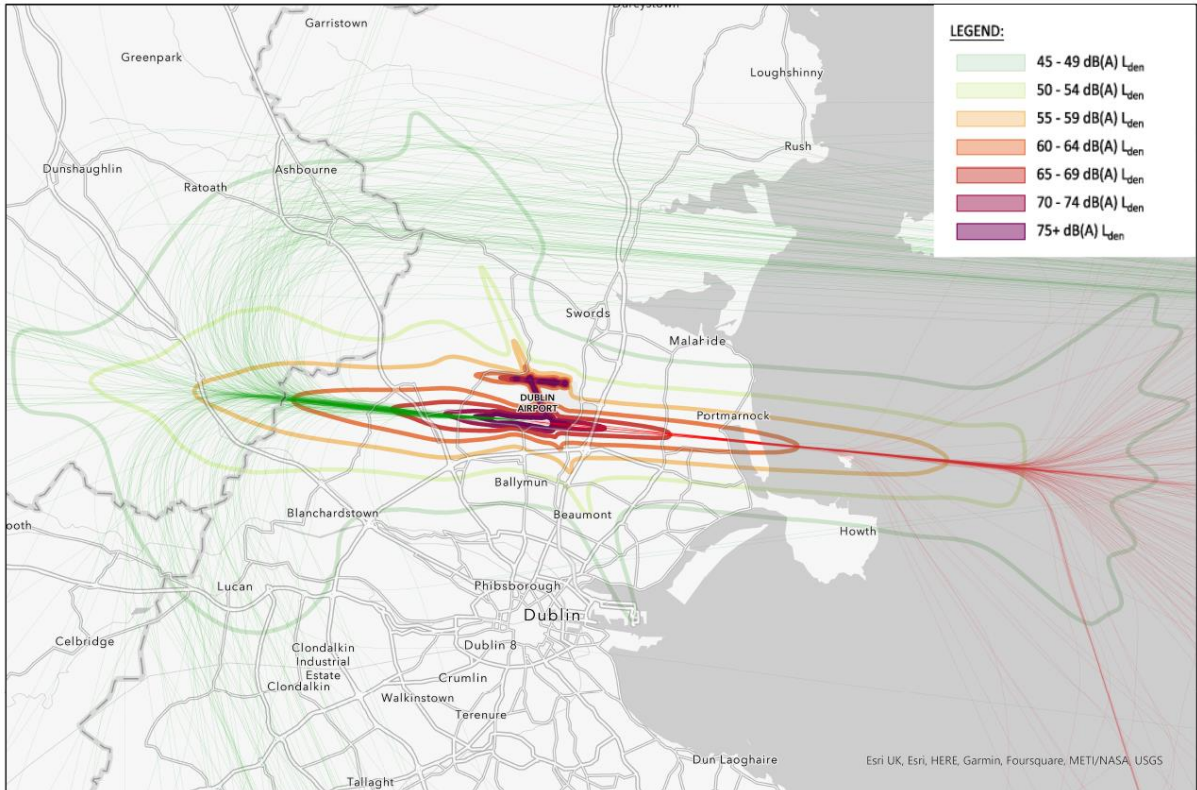


Figure 92 – Busiest Day Westerly Operations and Annual  $L_{den}$

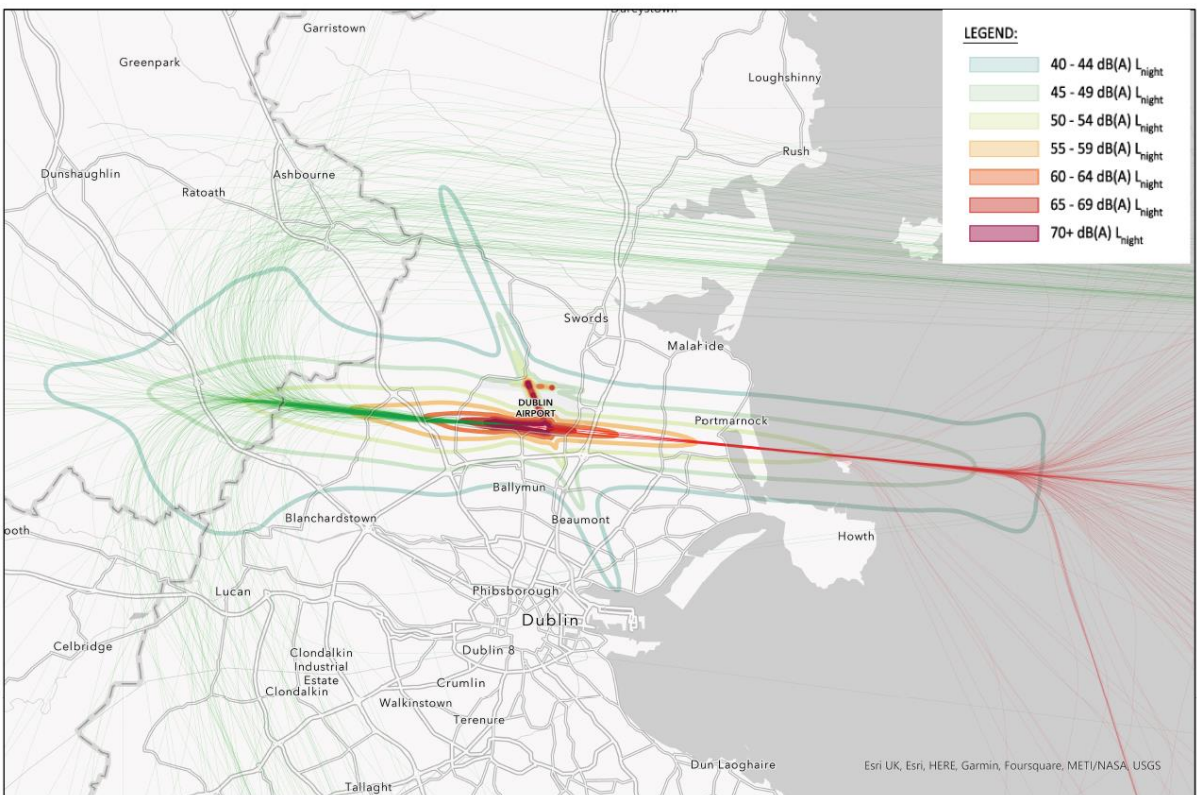


Figure 93 – Busiest Day Westerly Operations and Annual  $L_{night}$







## 8.0

# Compliance with Noise Mitigation Measures





## 7.0 Compliance with Noise Mitigation Measures

**Table 18** describes the noise mitigation measures in place at Dublin Airport, as well as providing 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 provided, which is further explained in Section 9.

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	Discussions continued throughout 2022 on the promotion of quieter aircraft and the appropriate use of metrics and methodology to track performance improvement. Overall improved collaborative engagement is required to promote quieter aircraft.
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	Live charging for noise was introduced on 1st July 2022. In 2022 the noise charging QC applied a rate for night-time use only (2300 – 0659L).

Noise Abatement Operating Procedures										
Ref	Source	Description	Method of Monitoring/Systems		Other Measure/Enforcement	Opinion on Compliance				Effectiveness/Performance
			Method	System		2019	2020	2021	2022	
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				* Refers to usage 1st Jan - 22nd Aug, pre-opening of NR. ** refers to usage 24th Aug - 31st Dec, post NR opening. The low level of Departures off Rwy 34,10 and 16 respectively indicates close to minimum usage and adherence to operating procedure.
						26% usage RWY 10 ~1.5% usage RWY 16 72% usage RWY 28 ~0.5% usage RWY 34 N/A	10.3% usage RWY 10 1.5% usage RWY 16 86.8% usage RWY 28 0.5% usage RWY 34 0.9% Helicopter	12.46% usage RWY 10 0.82% usage RWY 16 85.79% usage RWY 28 0.19% usage RWY 34 0.74% Helicopter	11.64% usage RWY 10* 0.65% usage RWY 16 49.89% usage RWY 28* 0.02% usage RWY 34 7.45% usage RWY 10R** 1.07% usage RWY 10L** 24.68% usage RWY 28L** 3.76% usage RWY 28R**	
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 investigations to IAA-ANSP and relevant airport users as necessary.	Compliant				Continued requirement for improvement to Track Keeping against all off track violations identified. 10,917 violations were recorded in ANOMS for 2022. 3,005 notification of violations issued to IAA-ANSP/AirNav Ireland. The reduction in performance arises due to opening of North RWY operations and difficulties with implementation of appropriate Environmental Noise Corridors and the ability of airlines/aircraft types to fly the required tracks. A more streamlined investigation of violations in partnership with AirNav Ireland remains to be advanced.  RWY 10R - 88.02% (995 of 8,304) RWY 16 - 91.39% (74 of 859) RWY 28 - 95.28% (2,316 of 49,036) RWY 28L - 95.97% (816 of 20,226) RWY 28R - 62.45% (6,716 of 10,754) RWY 34 - 100%
						99.2% Track Keeping	99.14% Track Keeping	99.55% Track Keeping	87.76% Track Keeping (10,917 of 89,180 CAT C/D Dep)	

Ref	Source	Description		Other Measure/Enforcement	Opinion on Compliance				Effectiveness/Performance		
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			13 Airline responses to NADP II survey indicating implementation of NADP II	The 13 responses constitute responsibility for 75.3% of Departures at Dublin Airport (based on 2023 YTD movements)	
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 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.	EURO CONTROL	Statutory monitoring and reporting via IAA-ANSP and EUROCONTROL.	Compliant				CCO 99.6% Compliance indicates continued very good performance. Lower CDO 55.1% compliance indicative of learning curve associated with crews and controllers coming back into normal traffic levels after COVID. CDO operations at Dublin is restricted by neighbouring airspace structures. Most recently, from an Irish perspective continuous descent operations (CDO), from January to December 2022 the amount of time flown level during descents from FL 75 into Dublin airport averaged 56.7 seconds per descent, 21.3 seconds lower than in 2019.  Average CDO below FL75 throughout the European network is 54.5%	
						2019	2020	2021	2022		
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 remains to be commenced and will form 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				3 of 16 non-compliant engine test runs took place at weekends. 11 engine test runs on RWY 16/34 threshold have no time noted. Performance and reporting require improvement plan.	
						2019	2020	2021	2022		
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		2022		Partial Compliance. Monitoring and reporting requirements for RWYs 10R, 28L, 16 and 34 in order. Monitoring and reporting of RWYs 10L and 28R hindered due to unexpected flight path deviation from respective SIDs. Data issues with pathname designation for each movement off RWYs 10L/28R did not allow correct correlation with appropriate SID and thus appropriate monitoring against designated SID.	Requirement for improvement to monitoring and reporting of all off track violations remains. Pathname correction is now completed allowing appropriate flight track monitoring off RWYs 10L/28R. Potential for better identification and turnaround in partnership with IAA-ANSP and AirNav Ireland



<b>Land Use Planning &amp; Management</b>							
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 Pleanála Planning Permission NR	Compliant	157 of 202 eligible houses have benefited.
LU-6	NR - RFI 116	Voluntary Dwelling Purchase Scheme	Community Engagement Department, Communications Department	N/A	Condition 6 of An Bord Pleanála Planning Permission NR	Compliant	10 of 38 eligible properties have benefited from the scheme to date.
LU-7	NR - RFI 116	Voluntary School Sound Insulation	Community Engagement Department, Communications Department	N/A	Condition 9 of An Bord Pleanála Planning Permission NR	Compliant	6 eligible schools acoustically tested. 3 of 4 qualifying schools that opted in have had or are in the process of having measures installed.
<b>Monitoring &amp; Community Engagement</b>							
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. Noise included as standing item.
CE-2	FCC NAP; daa NMP;	Community Engagement Programme	Community Engagement Department, Communications Department	N/A	Condition 28 of An Bord Pleanála Planning Permission 2007 for NR.	Compliant	CLG, DAEWG and drop-in clinic forums well established and attended.

Ref	Source	Description	Method	System		Opinion on Compliance			Effectiveness/Performance	
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			Partial Compliance  The NFTMS enabled adequate analysis of aircraft movements from Jan-Aug. The measurement of resultant noise levels at key locations on the approach and departure routes for RWYs 10R, 28L, 16 and 34 was maintained throughout the year. Monitoring of track-keeping adherence off RWYs 10L and 28R between Aug-Dec was not possible owing to missing pathname designation and resultant correlation to the appropriate SIDs. Measurement of noise for movements off RWYs 10L and 28R was facilitated by existing noise monitors and the expansion of the network with additional noise monitors at Swords, Malahide and St. Margarets. Deployment of a dedicated engine test site/ ground noise monitor was completed and implemented for part of 2022. Interim temporary noise monitors were deployed to 4 locations off RWY 28R in mid-December. Works on additional fixed and mobile noise monitoring terminals advanced in line with the Direction received by ANCA. Further enhancements to the fixed and mobile noise monitors are ongoing with scheduled completion of at least 15 of 23 fixed installations by 24th Aug 2023.	
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			Manual nature of investigations of violations requires further collaborative work with IAA-ANSP/AirNav Ireland. Indirect complaints submitted via daa Customer Experience Portal/ Airport Operations Control centre, and the reception desk remain problematic to effectively track. Response times generally in line with ambition.	
						2019	2020	2021		2022
						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	13,613 complaints / 13,658 logged on NFTMS / 135,77 complaints responded to / 1 of 29 further complaints investigated and closed		32,646 complaints logged on NFTMS / 27,371 complaints responded to / 75 of the 3,002 violations issued to IAA-ANSP/AirNav Ireland were linked to a complaint and issued for investigation / 0 of 75 further complaints referred for investigation and closed

Ref	Source	Description	Method of Monitoring/Systems		Other Measure/Enforcement	Opinion on Compliance	Effectiveness/Performance
			Method	System			
PC-1	Planning Condition 3(d)	Runway 10L-28R shall not be used for take-off or landing between 2300 hours and 0700 hours	N/A	N/A	N/A	Currently the subject of a High Court action.	N/A
PC-2	Planning Condition 5	The average number of night time aircraft movements at the airport shall not exceed 65/night (between 2300 hours and 0700 hours) when measured over the 92 day modelling period	N/A	N/A	N/A	There is currently a live planning application which relates to the night-time use of the runway system at Dublin Airport (Ref. F20A/0668; ABP Ref. F20A/0668), on which daa expect a decision from An Bord Pleanála in the near future.	N/A

99Table 18 – Noise Mitigation Measure Compliance

# 9.0

## Opportunities for Improvement







## 8.0 Opportunities for Improvement

Table 18 (in the preceding section) presents an opinion on the effectiveness or performance of the relevant noise mitigation measures. This commentary was reviewed against the relevant requirement within the Aircraft Noise (Dublin Airport) Regulation Act 2019, Part 4, Section 19, and the source documents. **Table 19** presents opportunities for improvement, where technically feasible and possible. Several opportunities, identified in 2021, are currently in progress with updates provided along with additional areas identified. The multidisciplinary and agency requirements of some of the opportunities will require further investigation, review, and consultation with regulatory bodies and airport users prior to any planned implementation.

Opportunities for Improvement						
OFI	Ref	Criteria/Policy	Opportunity for Improvement	Consultation Requirement	Status	Expected Implementation
OFI-001	NA-2	Two-Runway Noise Preferential Routes (NPRs) and Flight-Track Keeping	Efficient monitoring of movements against vectoring of aircraft would allow more streamlined approach to improved flight-track keeping and complaint handling. Inter-agency process and procedures should be input to new service level agreement between daa and AirNav Ireland.	Consultation with AirNav Ireland is required to ensure IT system management, work practice change, and associated governance and protocol approval.	Consultation on-going	Consultations commenced late in 2021 and continued through 2022. The expected outcome of efficient reporting of violations by daa remained, with the added complexity of Runway 10L/28R violation reporting issues. Targeted implementation of Quarter 1 2023 has not been met. Proposed revised target Quarter 1 2024.
OFI-002	NA-3	Noise Abatement Departure Procedures (NADPs) 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	Completed	Manual reporting of NADP 2 compliance completed for Annual Report 2022.
OFI-003	NA-4	Visual Approach Jet Aircraft (Category 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 Noise Corridors. Thereafter, discussions with IAA-ANSP could identify if vectored to do so.	Consultation with AirNav Ireland required to review potential for implementation.	Commenced as part of flight-track keeping improvement programme as per OFI-001	TBA pending technical feasibility confirmation.
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 AirNav Ireland ongoing and to form part of the general airspace design review to be undertaken by Air Nav Ireland in 2022/2023.	Shadow rule implementation within the NFTMS is completed. Reporting to commence pending completion of stakeholder consultation.	Targetted completion of stakeholder consultation not completed by Q2 2023. TBA pending stakeholder discussions.
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 pending technical feasibility confirmation.
OFI-006	NA-9	Monitor and Report	Update of complaint handling procedures to detail process for flight-track violation reporting.	Internal consultation	Initial improvements made to procedures but further work and communication on ad-hoc complaint handling and indirect issue remains.	Implementation of a smarter, automated approach to high-volume complaints management is in progress with plug-in software modifications to the existing ANOMS. This will provide additional range of options for Communities and Dublin Airport to ensure improved high-volume complaints management. Targetted implementation Quarter 1 2023.
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	In progress. Three additional fixed NMTs and 1 mobile NMT installed in 2022 taking the total deployed to eleven. Ongoing work to provide an additional thirteen fixed NMTs. Dublin Airport completed three additional short-term deployments of NMTs for Community reporting within 2022.	Q1 2023 – Targetted completion of additional fifteen fixed NMTs and two mobile NMTs not completed by Quarter 1 2023. Delay largely related to protracted planning consent, licensing and planning permission approval processes. Remainder of NMTs required under Direction by the ANCA will be completed by mid-Quarter 4 2023.

OFI-008	General	Section 19 (4) a-f responses	Ensure specific response to requirements to the Dublin Airport Noise Act (2019) Section 19 (4) a-f is satisfied.	ANCA, internal consultation	Clarification of further information received from ANCA. Inclusion of information within updated 2020 report and 2021 Annual Report completed. Schedule of tasks set out prior to compilation of 2022 Annual Compliance report.	Completed and incorporated into 2022 Annual Compliance report.
OFI-009	NA-9	Monitor and Report	Review of SID centrelines and locations of NMTs with view to ensuring departure noise limit monitoring at 6.5km from start of roll of aircraft is available. Additional and/or relocation of existing NMTs may be required along with the installation of dedicated weather stations to ensure correct and accurate correlation with aircraft movements.	ANCA, internal consultation	Review commenced.	Targetted completion of review Q4 2023. Schedule for any resulting deployment or relocations TBA.
OFI-010	CE-4	Noise Complaint Management Systems	Increase in complaint management requirements and associated delayed response times requires improved management through software and training. Consideration of procedural change in serial complainant handling to ensure effective response is not compromised to all complainants.	ANCA, internal consultation	Internal discussions commenced.	Targetted date for proposal to the ANCA Q3 2023.
OFI-011	NA-9	Monitor and Report	Inclusion of violation metrics in monthly and quarterly reports. Breakdown by Easterly and Westerly operations and/or affected communities. Use of agglomeration shapefiles within ANOMS to provide more detailed community data.	FCC Compliance, ANCA, internal consultation	Commenced. Review against NR Planning Condition 10.	Phased commencement of violations reporting from Q3 2023. Remainder TBA.

Table 19 – Opportunities for Improvement



# 10.0

## Conclusion - Opinions on Compliance







## 9.0 Conclusion – Opinion on Compliance

The Aircraft Noise (Dublin Airport) Regulation Act 2019, Part 4, Section 19 requires daa to take appropriate steps to ensure that all airport users comply with noise mitigation measures and operating restrictions.

We have undertaken a detailed review of these criteria and the performance of airport users over 2022. As detailed in this report, noise mitigation measures and operating restrictions have been substantially met. As outlined in this report, there are some minor nonconformities. However, we have clearly identified a roadmap to how these will be achieved over the coming months. We are committed to achieving best practice in industry standards and to working with ANCA, other regulatory bodies and airport users to this end.



# 11.0

## Glossary







## 10.0 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 Publication
ANCA	Aircraft Noise Competent Authority
ANSP	Air Navigation 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 Operation
CDO	Continuous Descent Operation
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
EIDW	Dublin International Airport, Dublin, Ireland
FCC NAP	Fingal County Council Noise Action Plan
FL	Flight Level
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>	Maximum value the A-weighted sound pressure level reaches during a measurement period.
LAP	Local Area Plan
L <sub>den</sub>	Weighted average of the yearly individual noise level during daytime, evening, and night-time periods
L <sub>night</sub>	Weighted average of the yearly individual noise level specifically during the night-time period (23:00 – 07:00)
LOC	Localiser approach (non-precision runway approach aid)
MTOW	Maximum Take-Off Weight
NADP	Noise Abatement Departure Procedure
NFTMS	Noise and Flight Track Monitoring System
NM	Nautical Miles
NMP	Noise Management Plan
NMT	Noise Monitoring Terminal

NR RFI	North Runway Request for Information
PP	Planning Permission
QC	Quota Count
Reverse thrust	Using the engine of the aircraft for braking after landing on the runway.
RNIS	Residential Noise Insulation Scheme
SID	Standard Instrument Departure procedure
STAR	Standard Terminal Arrival procedure
TBA	To be advised.
TBC	To be confirmed.

12.0

# Appendices





## 11.0 Appendices





## Appendix A – Instrument Flight Procedures Listings for 2022

Chart	IFP Name	AIP Effective	Target AIP	Reason for Change	Flight Procedure Change Affecting Operating Procedure (Y/N)		Potential Noise Impact from Flight Procedure Change (Y/N)	Incidents of Failure to Comply with Flight Procedure Change Leading to Noise Event / Track Violation (Y/N)	Status	
AD 2.24-11	Runway 28L C-D SIDs	08-Sep-22	TBC		<i>Not relevant for RWY28L SIDs track straight ahead to 3000feet before turning=No noise corridor issues?</i>		2022: SIDs rationalised with level constraints added to allow for Continuous Climb Operations (CCOs), thus improving noise output.	N/A	N/A	
AD 2.24-12	Runway 28R A-B SIDs	06-Oct-22	N/A	New IFP	N/A		2022: SIDs rationalised with level constraints added to allow for Continuous Climb Operations (CCOs), thus improving noise output. Require 30-degree offset for initial departure for SOIR. This should support noise dispersion and a balanced approach to noise management with use of all runways.	N/A	N/A	
AD 2.24-13	Runway 28R C-D SIDs	20-Apr-23	N/A	New IFP	N/A		2022: SIDs rationalised with level constraints added to allow for Continuous Climb Operations (CCOs), thus improving noise output. Require 30-degree offset for initial departure for SOIR. This should support noise dispersion and a balanced approach to noise management with use of all runways.	N/A	N/A	
AD 2.24-14	Runway 10L A-B SIDs	06-Oct-22		New IFP	N/A		New SIDs reflecting noise requirements	N	N	
AD 2.24-15	Runway 10L C-D SIDs	20-Apr-23		New IFP	N/A		New SIDs reflecting noise requirements	N	N	
AD 2.24-16	Runway 10R A-B SIDs	11-Aug-22	N/A		-This applied in AIP in 2020, i.e., part of default noise mitigation measures		2022: SIDs rationalised with level constraints added to allow for Continuous Climb Operations (CCOs), thus improving noise output.	TBC	TBC	
AD 2.24-17	Runway 10R C-D SIDs	16-Jun-22	10-Jul-21		<i>RWY10R SIDs track straight ahead to 4000feet before turning = No noise corridor issues?</i>		2022: SIDs rationalised with level constraints added to allow for Continuous Climb Operations (CCOs), thus improving noise output.	TBC	TBC	
AD 2.24-19	Runway 16 C-D SIDs	05-Nov-20	10-Jun-22		N/A			N/A	N/A	

Chart	IFP Name	AIP Effective	Target AIP	Reason for Change	Flight Procedure Change Affecting Operating Procedure (Y/N)	Potential Noise Impact from Flight Procedure Change (Y/N)	Incidents of Failure to Comply with Flight Procedure Change Leading to Noise Event / Track Violation (Y/N)	Status
AD 2.24-21	Runway 34 C-D SIDs	06-Oct-22	10-Jun-22		N/A	N/A	N/A	
AD 2.24-22.1	Runway 28L/R STARs with lateral holding	06-Oct-22	TBC	New IFP	N/A as NR related	2022: New STARs redeveloped to serve Runways 28L and 28R. Improved altitude profiles for descending aircraft should improve environmental performance.	N/A	N/A
AD 2.24-22.4	Runway 28L/R STARs without lateral holding	06-Oct-22	TBC	New IFP	N/A as NR related	Fuel planning STARs for shortened routes requiring less fuel and improving aircraft performance.	N/A	N/A
AD 2.24-23.1	Runway 10L/R STARs with lateral holding	06-Oct-22	TBC	New IFP	N/A as NR related	2022: New STARs redeveloped to serve Runways 10L and 10R. Improved altitude profiles for descending aircraft should improve environmental performance.	N/A	N/A
AD 2.24-23.5	Runway 10L/R STARs without lateral holding	06-Oct-22	TBC	New IFP	N/A as NR related	Fuel planning STARs, for shortened routes requiring less fuel and improving aircraft performance.	N/A	N/A
AD 2.24-26	RNP Runway 28L	11-Aug-22	TBC	New IFP	N	Updated Instrument Approach Procedure (IAP) with PBN RNAV1 applied, giving more accurate procedure, and thus assisting with environmental management.	N/A	N/A
AD 2.24-27	ILS Categories I and II or LOC Runway 28L	11-Aug-22		New IFP	N	Updated Instrument Approach Procedure (IAP) with PBN RNAV1 applied, giving more accurate procedure, and thus assisting with environmental management.	N/A	N/A
AD 2.24-29	RNP Runway 28R	01-Dec-22		New IFP for 2022 as part of NTPR	N/A		N/A	N/A
AD 2.24-30	ILS Categories I and II or LOC Runway 28R	06-Oct-22		New IFP for 2022 as part of NTPR	N/A		N/A	N/A
AD 2.24-32	RNP Runway 10L	01-Dec-22	TBC	New IFP for 2022 as part of NTPR	N/A	New Instrument Approach Procedure (IAP) with PBN RNAV1 applied, for initial and missed approach segments, giving more accurate procedure, and thus assisting with environmental management.	N/A	N/A
AD 2.24-33	ILS Categories I and II or LOC Runway 10L	06-Oct-22	TBC	New IFP for 2022 as part of NTPR	N/A	New Instrument Approach Procedure (IAP) with PBN RNAV1 applied for initial and missed approach segments, giving more accurate procedure, and thus assisting with environmental management.	N/A	N/A

## Appendix B – Noise Insulation Progress Report

### **Progress Statement on LU-5, Sound Insulation LU-6, Voluntary Dwelling Purchase Scheme LU-7, School Insulation Scheme**

#### **LU-5 Sound Insulation**

Dublin Airport’s residential insulation programme comprises two initiatives, namely the Residential Noise Insulation Scheme (RNIS) associated with North Runway, and the Home Sound Insulation Programme (HSIP).

Condition 7 of An Bord Pleanála’s 2007 grant of planning permission for North Runway stipulated that “Prior to commencement of development, a scheme for the voluntary noise insulation of existing dwellings shall be submitted to and agreed in writing by the planning authority. The scheme shall include all dwellings predicted to fall within the contour of 63dB LAeq 16 hours within 12 months of the planned opening of the runway for use. The scheme shall include for a review every two years of the dwellings eligible for insulation”.

The projected 2022 63dB LAeq 16 hours eligibility contour associated with North Runway’s voluntary Residential Noise Insulation Scheme (RNIS) is indicated by the blue line on the map below. In establishing the Scheme, daa also voluntarily undertook to have regard to the noise contour submitted to An Bord Pleanála in 2007 which encompasses a larger area and extends the insulation scheme to more homes (green line). As a result, over 40% more dwellings are eligible to benefit from that insulation scheme than are required under planning.

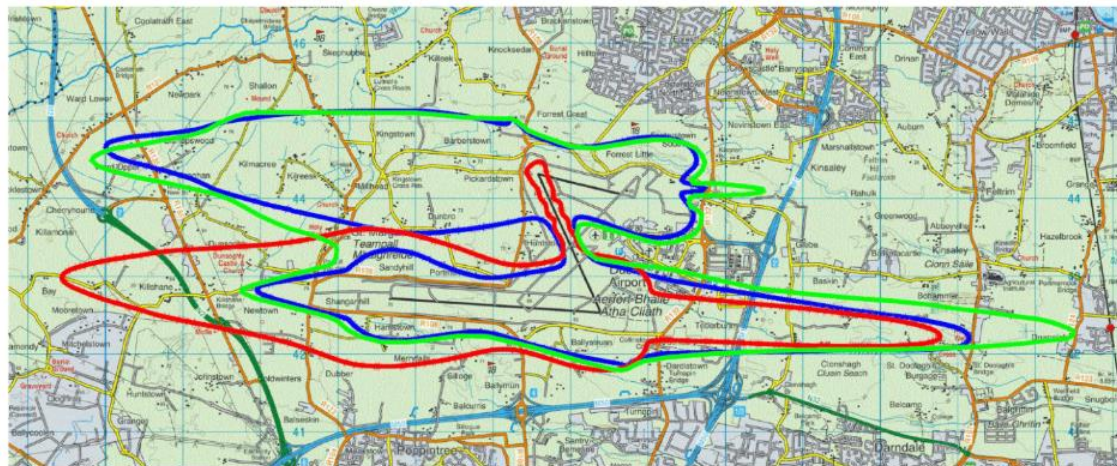
Following extensive engagement with and feedback from eligible residents, the draft Scheme was presented to Fingal County Council (FCC) and their independent consultants for review. The RNIS was approved in December 2016.

The main features of the RNIS include a survey of each participating dwelling with production of a bespoke Statement of Need which includes recommended insulation measures specific to that dwelling which cover all or a combination of (a) acoustic double glazing, (b) acoustic ventilation, (c) attic insulation and (d) chimney capping. In addition, the Scheme specified that a 20% representative sample of dwellings would be selected and submitted to FCC, and acoustic monitoring would take place at these dwellings before and after works to demonstrate the effectiveness of the works. The 20% sample was submitted to FCC in July 2018 and approved. These dwellings will also be revisited on a biennial basis after North Runway opens to monitor continued effectiveness.

In 2017, Dublin Airport wished to implement a residential noise insulation scheme for those dwellings currently impacted at similar noise levels, but which were not eligible under the North Runway scheme because predicted levels in their areas would be lower when North Runway was operational. To this end, the Home Sound Insulation Programme (HSIP) was launched.

That Scheme afforded the same range of insulation measures available under RNIS to over 70 additional local houses (red line on map) which were previously insulated under an earlier insulation scheme associated with the opening of Runway 10/28 (southern runway), and those dwellings which were located in the 2016 63dB LAeq 16h contour.

Both programmes combined affords eligibility for free insulation for over 200 local houses.



Of those houses which were eligible under the RNIS, 64% opted to participate in the Scheme, with a further 17% opting to defer works until the biennial reviews (for various reasons including having recently undertaken insulation works themselves, timing of works unsuitable, purchase/sale of the property incomplete, legal title of house in dispute, awaiting result of planning application, etc., etc.). 17% of households did not participate because of ongoing legal action at the time, and their later request to extend the opt-in deadline could not be accommodated; they will, however, be considered again as part of the biennial reviews); 2% of households have been purchased by daa and did not require works.

Of those houses which were eligible under HSIP, 92% opted to participate in the Scheme, with the remainder either not responding to any engagement or opting not to participate.

Following an extensive tendering process which resulted in the appointment of the main contractor in 2019, works have steadily progressed in the intervening time. Notwithstanding the impact of Covid during which works had to be suspended in compliance with Government guidelines, the RNIS insulation works are now complete, bar minor snagging at two dwellings, and all HSIP insulation works are complete, bar one dwelling.

Pre-works monitoring has been undertaken at all dwellings in the representative sample. Post-works monitoring was completed at 10 of these dwellings before Covid, with eight further houses monitored when easement of Government restrictions permitted; monitoring at the three remaining properties will take place when homeowner circumstances and access permits.

Compliance  Effectiveness

#### LU-6 Voluntary Dwelling Purchase Scheme

Condition 9 of An Bord Pleanála's 2007 grant of planning permission for North Runway stipulated that "Prior to commencement of development, a scheme for the voluntary purchase of dwellings shall be submitted to and agreed in writing by the planning authority. The scheme shall include all dwellings predicted to fall within the contour of 69 dB LAeq 16 hours within twelve months of the planned opening of the runway for use. Prior to the commencement of operation of the runway, an offer of purchase in accordance with the agreed scheme



shall have been made to all dwellings coming within the scope of the scheme and such offer shall remain open for a period of 12 months from the commencement of use of the runway”.

Houses located in the projected 2022 69dB LAeq 16h contour (red line on map below) are eligible to participate (5), and daa voluntarily extended the scheme to additional houses to honour prior commitments and which were located in earlier projections of that contour (33).



Following extensive engagement with and feedback from eligible residents and their advisors, the draft Scheme was presented to FCC and their independent consultants for review. The VDPS was approved in December 2016.

The scheme provides a 30% uplift on current market value, with no impact from North Runway, and offers very attractive allowances for stamp duty, legal and conveyancing expenses, tax advice and moving costs.

Of the 38 properties which are eligible to participate in the VDPS, 10 have opted to do so, which has resulted in the acquisition of three thus far, with three other offers currently active. The unacquired dwellings will continue to be eligible to participate for three years after North Runway is operational or if a dwelling falls within the 69dB LAeq 16 hour contour as part of the biennial reviews. Of the five dwellings located in the projected 69 dB LAeq 16 hours contour, one has been acquired and offers have been made to the remaining four.

Compliance  Effectiveness

**LU-7 Voluntary Schools Sound Insulation**

Condition 6 of An Bord Pleanála’s 2007 grant of planning permission for North Runway stipulated that “Prior to commencement of development, a scheme for the voluntary noise insulation of schools shall be submitted to and agreed in writing by the planning authority (in consultation with the Department of Education and Science). The scheme shall include all schools and registered pre-schools predicted to fall within the contour of 60 dB LAeq 16 hours within twelve months of the planned opening of the runway to use and, in any event, shall include Saint Margaret’s School, Portmarnock Community School, Saint Nicholas of Myra, River Meade and Malahide Road schools. The scheme shall be designed and provided so as to ensure that maximum noise limits within the classrooms and school buildings generally shall not exceed 45 dB LAeq 8 hours (a typical school day). A system monitoring the effectiveness of the operation of the scheme for each school shall be

agreed with the planning authority and the results of such monitoring shall be made available to the public by the planning authority”.



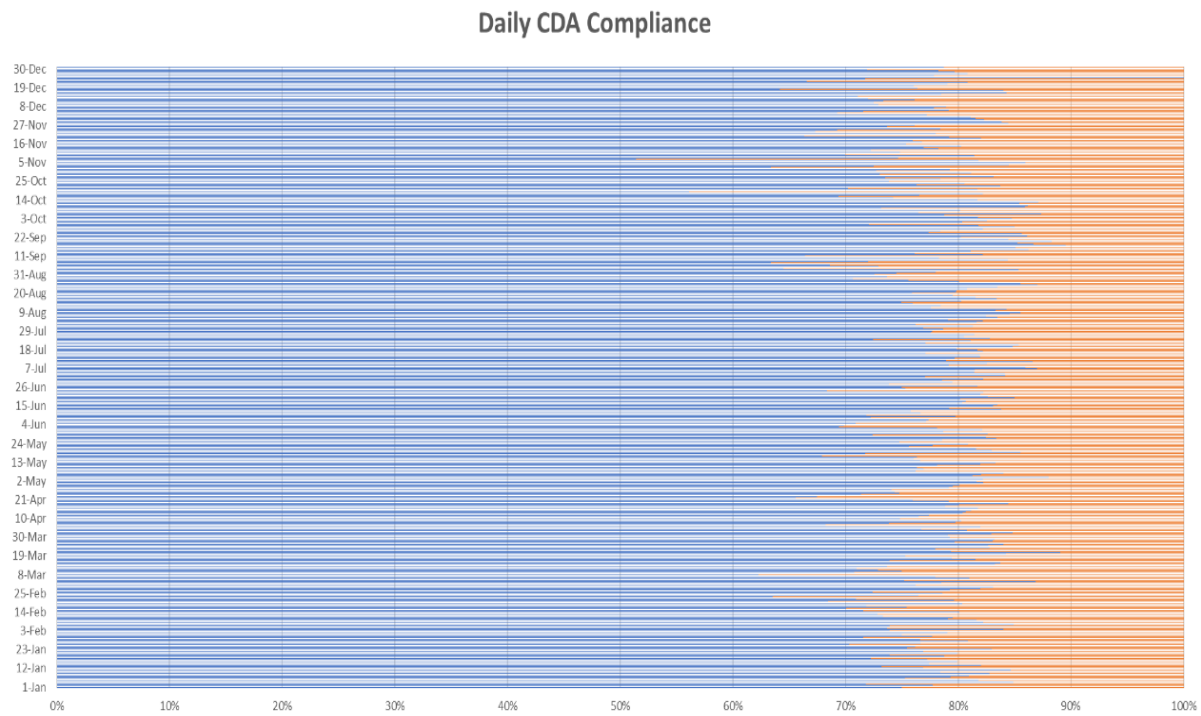
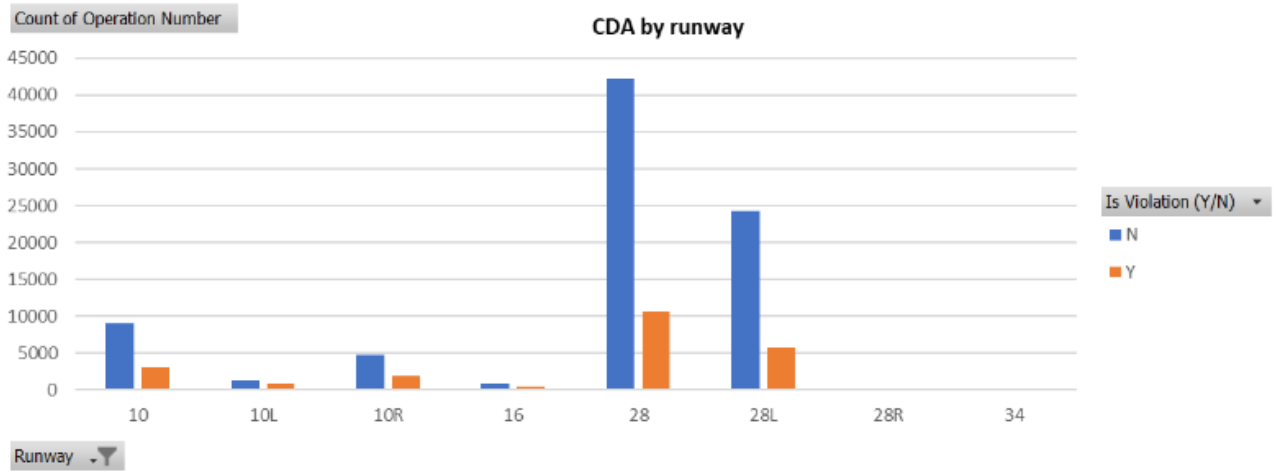
<b>Those within the Noise Contour</b>	<b>Those named by An Bord Pleanála</b>	60dB contour
<b>A</b> Little Moo Moo's Pre School	<b>D</b> Mary Queen of Ireland N.S, Rivermeade	
<b>B</b> St. Margaret's N.S	<b>E</b> Portmarnock Community School	
<b>C</b> Nzone crèche and Pre School	<b>F</b> Saint Nicholas of Myra	

Following consultation with the six listed schools, acoustic testing was undertaken at each which determined that two of the schools (Portmarnock Community School and Mary Queen of Ireland National School) did not exceed the 45dB threshold and thus no works were required at these schools.

Of the four remaining eligible schools, three (Little Moo Moo's Pre-School, St. Margaret's National School and St. Nicholas of Myra National School) opted to have the recommended insulation measures installed. These works were undertaken during 2020 and 2021, after which post-works monitoring took place and all were shown to fully comply. Nzone Creche and Pre-School did not wish to have the any of the proposed insulation options installed, but they will continue to be eligible for consideration again as part of the biennial reviews after North Runway is operational.

Compliance  Effectiveness

# Appendix C – Continuous Descent Approach Violations



Vertical Scale from 1 Jan to 31 Dec 2022 (Bottom to top)

Horizontal Bars  
 Blue = CDA Compliance  
 Orange = CDA Non-Compliance



## Appendix D – Table of Destinations

This table shows the top 30 destination and origin airports for 2022 based on departure and arrival aircraft movements, respectively.

Rank	Destination	Airport Code	Departures	Rank	Origin	Airport Code	Arrivals
1	London - Heathrow	LHR	5,200	1	London - Heathrow	LHR	5,203
2	Amsterdam	AMS	4,160	2	Amsterdam	AMS	4,147
3	London - Gatwick	LGW	4,125	3	London - Gatwick	LGW	4,113
4	Manchester	MAN	3,551	4	Manchester	MAN	3,510
5	London - Stansted	STN	3,097	5	Birmingham - UK	BHX	3,426
6	Birmingham - UK	BHX	2,968	6	London - Stansted	STN	3,091
7	Paris - Charles De Gaulle	CDG	2,795	7	Paris - Charles De Gaulle	CDG	2,638
8	Edinburgh	EDI	2,615	8	Edinburgh	EDI	2,621
9	Frankfurt	FRA	2,177	9	Glasgow	GLA	2,086
10	Glasgow	GLA	2,071	10	Frankfurt	FRA	1,973
11	Lisbon	LIS	1,875	11	Lisbon	LIS	1,876
12	Malaga	AGP	1,823	12	Malaga	AGP	1,826
13	Barcelona	BCN	1,799	13	Barcelona	BCN	1,810
14	Faro	FAO	1,708	14	Faro	FAO	1,714
15	Bristol	BRS	1,684	15	Bristol	BRS	1,677
16	Madrid	MAD	1,548	16	Brussels	BRU	1,572
17	London City	LCY	1,534	17	London City	LCY	1,550
18	Brussels	BRU	1,466	18	Madrid	MAD	1,547
19	London - Luton	LTN	1,314	19	London - Luton	LTN	1,344
20	Munich	MUC	1,271	20	Munich	MUC	1,267
21	Liverpool	LPL	1,233	21	Liverpool	LPL	1,248
22	Berlin Brandenburg	BER	1,229	22	Berlin Brandenburg	BER	1,242
23	Chicago - O'Hare	ORD	1,215	23	Lanzarote	ACE	1,168
24	Toronto - Pearson	YYZ	1,179	24	Leeds Bradford	LBA	1,134
25	Lanzarote	ACE	1,173	25	New York - JFK	JFK	1,064
26	Washington - Dulles	IAD	1,162	26	Zurich	ZRH	1,008
27	Leeds Bradford	LBA	1,146	27	Boston	BOS	976
28	New York - JFK	JFK	1,063	28	Chicago - O'Hare	ORD	962
29	East Midlands	EMA	1,024	29	Toronto - Pearson	YYZ	899
30	Zurich	ZRH	1,015	30	Addis Ababa	ADD	888
	Total (all destinations)	Total	106,224		Total (all origins)	Total	106,225