



Dublin Airport

Quarterly Noise and Flight Track Monitoring Report

January – March (Q1) 2024

- This report presents data from Dublin Airport's Noise and Flight Track Monitoring System.
- The publication of this quarterly report is a requirement under Condition 10 of North Runway's planning permission.
- The report is split into two parts:
 - Part 1: Noise Monitoring
 - Part 2: Flight Track Monitoring
- Noise data is presented in this report in five different metrics - Lden, Lnight, Leq16h, Lmax and SEL.
- Environmental noise from transport systems – airports, road and rail - is regulated by the EU Environmental Noise Directive (END). The END refers to the Lden and Lnight metrics to assess noise impact and to measure longer term improvements and goals. These two metrics are also used by the World Health Organisation (WHO).
- The Summer Leq16h is used at Dublin Airport for the Noise Insulation and Voluntary Dwelling Purchase Schemes and is widely used in the UK.
- Lmax and SEL are single event metrics and are not generally used on their own to assess noise impact by authorities. By including the number or frequency of events at different levels, they provide a different way of representing the noise situation.
- This report demonstrates good correlation between the noise measurements obtained from Noise Monitoring Terminals and the modelled noise contours. This should provide confidence in the accuracy of the contours. Noise contours cover the entire study area whereas noise monitors only report noise at the actual monitoring locations.
- Areas closest to Dublin Airport experience the highest levels of noise e.g. Lden levels at St. Margaret's NS for March 2024 was 62.7dBA and on the Coast Road, Portmarnock was 61.7dBA
- Further out, the noise decreases e.g. Lden levels at Ratoath for March 2024 was 44.9dBA and in Dunboyne it was 52.5dBA.
- Flight track monitoring data is used to separate aircraft noise events from non-aircraft (community) noise at the NMT.
- Modelling for the noise contour calculations also relies on the flight track monitoring.

Part 1: Noise Monitoring Data



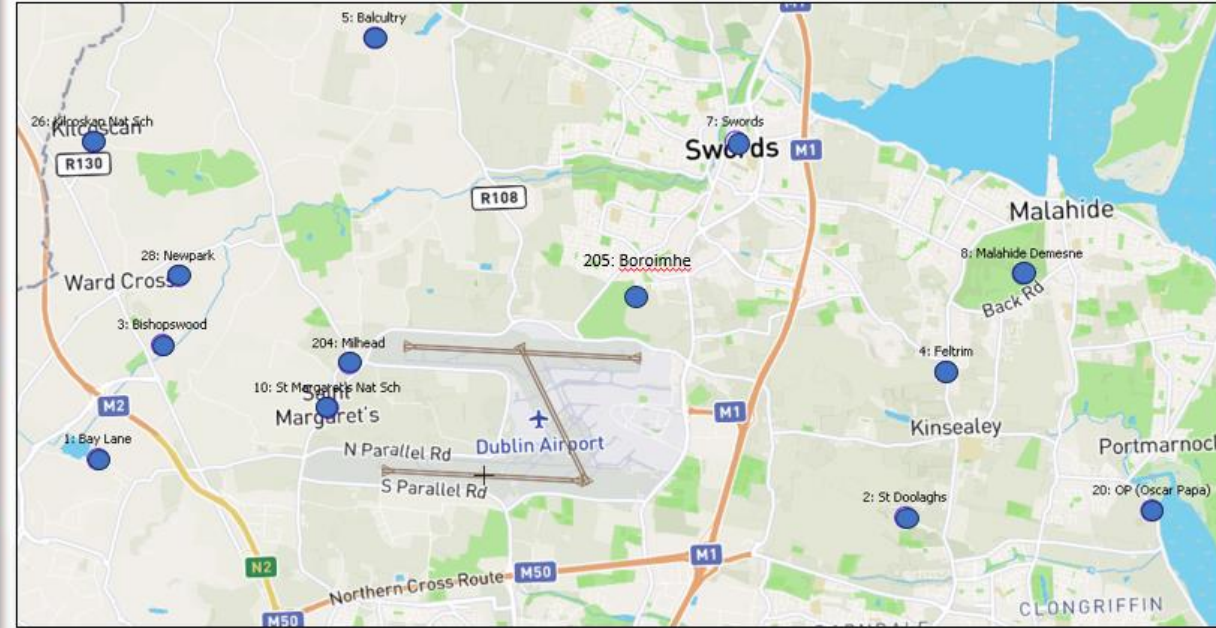
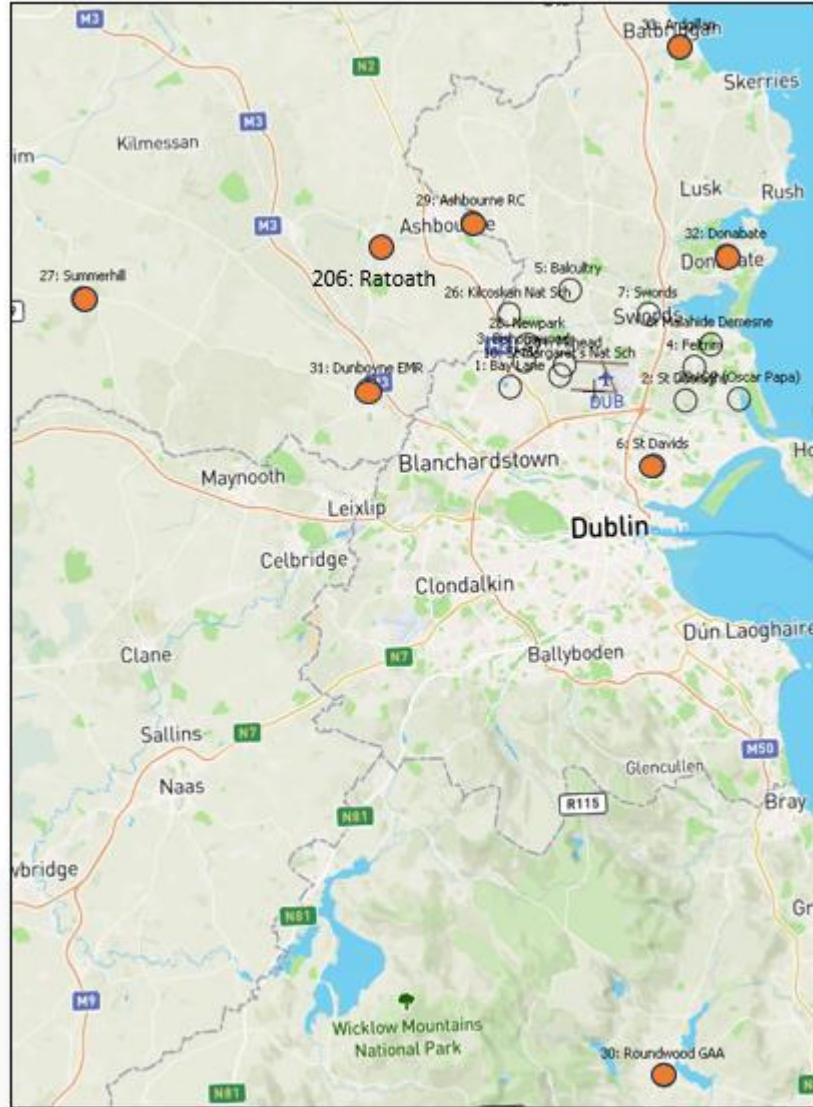
Page	Page Heading	Page Content
5 & 6	Explanation of Terms	
7	Locations of Noise Monitoring Terminals (NMTs)	<ul style="list-style-type: none"> • Maps indicating locations of active Dublin Airport NMTs • Installation dates of NMTs
8	Modelled Lden Noise Contour Levels at NMT Locations	<ul style="list-style-type: none"> • Map of 2023 Lden Annual Aircraft Noise Contours • 2023 Lden noise levels at each NMT as indicated in the Noise Contour map.
9	NMT Operational Data and Number of Correlated Noise Events	<p>For each month in the quarter:</p> <ul style="list-style-type: none"> • Uptime (%) at each NMT • Downtime (minutes) for each NMT • The number of correlated aircraft noise events at each NMT per month and in the quarter.
10	NMT – Q1 Monthly and Quarterly Lden, Lnight and Leq16hr Data	<p>For each month and over the quarter:</p> <ul style="list-style-type: none"> • Measured Aircraft Noise at each NMT displayed in Lden, Lnight and Leq16hr metrics.
11	NMT – Q1 Aircraft Noise Event and Measured Lden/ Lnight Data	Chart showing Q1 correlated aircraft noise events and the measured Lden and Lnight data at each NMT
12	NMT – 2023 and 2024 (YTD) Measured Lden, Lnight and Leq16hr Data	<ul style="list-style-type: none"> • 2023 Lden and Lnight Modelled Contour levels at each NMT location • 2023 annual measured aircraft noise levels in Lden and Lnight metrics at each NMT • Q1 2024 measured aircraft noise levels in Lden, Lnight and Leq16hr metrics at each NMT
13	NMT – Total Noise vs Aircraft Noise Q4 2023 and Q1 2024	<p>For Q4 2023 and each quarter this year:</p> <ul style="list-style-type: none"> • Measured Total and the Aircraft Lden levels at each NMT.
14	NMT – Q1 2024 Lmax and SEL (NA) Number Above (Daily Average)	<p>Measured Single Event data at each NMT:</p> <ul style="list-style-type: none"> • Daily Average of the Number of Aircraft Events over each Lmax value 60 to 85 [N60 to N85]. • Daily Average of the Number of Aircraft Events over each SEL value 70 to 95 [N(SEL)70 to N(SEL)95]
15	NMT – Q1 2024 Lmax and SEL Percentages (3 months)	<p>Measured Single Event data at each NMT:</p> <ul style="list-style-type: none"> • The distribution (%) of events over the quarter in each 5-decibel Lmax band (e.g. Lmax 60 - 65 dBA) and each SEL band (e.g. SEL 75 - 80 dBA).
16	Note regarding NMT 205 - Boromhe	

Term	Definition
Aircraft Noise	The noise generated by aircraft operating to or from Dublin Airport. For our noise monitors, this excludes aircraft not travelling to or from Dublin Airport and noise from local activity such as road traffic, wind, birds, dogs and community activity. (These other noise sources are included in the measured Total Noise.)
(Correlated) Aircraft Noise Event	This is a noise event that is matched to an aircraft flight near the location of the NMT and the time of the noise event. Only correlated aircraft noise events are used to calculate the measured aircraft noise (e.g. Lden, Lnight, Leq16) at the NMT location.
Downtime (minutes)	The number of minutes during the period that each monitor was not operational.
Lden	Lden is the day-evening-night level. It is a descriptor of noise level based on energy equivalent noise level (Leq) over a whole day or longer, with a penalty of 5 dBA for evening noise (19:00-23:00h or 7-11pm) and a penalty of 10 dBA for night-time noise (23:00-7:00h or 11pm-7am). The 5-decibel penalty means that an evening flight is treated as the equivalent of three daytime flights. The 10-decibel penalty means that a night flight is the equivalent of 10 daytime flights.
Leq	Leq is the Equivalent Continuous Sound Level and is the average sound level, over the given period, that has the same total energy as the actual time-varying noise.
Leq16(hr)	Leq16h is the Leq over the 16-hour day-time period (7am-11pm). The Summer Leq16hr covers the 92 days from mid-June to mid-September and, at Dublin airport, is used for assessing the Residential Noise Insulation Scheme.
Leq8(hr)	Leq8h is the Leq over the 8-hour night-time period (11pm-7am). The Summer Leq8hr covers the 92 days from mid-June to mid-September. Leq8h and Lnight cover the same period of the night, so monthly and quarterly values are identical. If the summer period is busier, the Summer Leq8h would be higher than the Annual Lnight.
Lmax	Lmax is the maximum instantaneous noise level recorded at an NMT during a noise event. The Dublin Airport WebTrak site displayed Lmax at each NMT, however, the data <u>includes</u> non-aircraft noise. This report includes only Lmax data from correlated aircraft noise events.
Lnight	Lnight is the night-time (11pm-7am) Leq average noise indicator. Like Lden, in this document, Lnight is reported monthly, quarterly and annually.
Measured noise levels	This is the assessment of the noise level at an NMT derived from data from the NMT. Each measured noise level is only at the NMT point location.
Modelled noise levels	This is calculated using computer software which takes into account all Dublin Airport flight operational activity. It calculates the noise levels at thousands of points across the study area and is used to produce Noise Contours. The Modelled noise level can also be calculated at each NMT point location.
(Notes: Comparing Measured and Modelled Noise Levels)	Measured noise levels at each NMT location should be the same, or close to, the Modelled noise levels. Measured data may miss some less noisy aircraft noise events, especially if the NMT is far from the airport (the aircraft is higher) or if the aircraft track is far from the NMT. Modelled data includes all aircraft activity in the entire study area. This means that Measured data should be equal to, or slightly lower than, the Modelled data. Good agreement between the Measured and Modelled data gives confidence that the Modelled Noise Contours provide good information on actual noise levels, including at locations that do not have an NMT.

Term	Definition
NMT	NMT means Noise Monitoring Terminal. They are generally located in community areas. An NMT includes a high-quality, calibrated microphone and provides continuous noise level data at the location of the NMT.
Noise Contours	Contours are lines that join points of the same modelled noise level covering a study area. All noise contours are modelled. Each year Dublin Airport publishes Annual Lden and Lnight contours and Summer Leq16h and Leq8h contours.
Noise Event	A noise event is detected at an NMT location when the noise level rises above and then falls below a pre-set threshold level. This can be caused by many different sources including aircraft, vehicles on a road, dogs barking, wind, sirens etc.
Number Above	Number Above is a single event metric unlike Lden or Lnight which are time-averaged noise metrics. N60 is the number of (aircraft noise) events with $L_{max} \geq 60$ dBA. N(SEL)70 is the number of (aircraft noise) events with $SEL \geq 70$ dBA. Note that N60 value includes the events in N65, N70 and higher.
SEL	SEL or Sound Exposure Level represents the total noise energy contained in a noise event, as if the same noise energy were compressed into a single second. For a short event (like a single dog bark) the SEL is approximately the same value as the L_{max} . For an aircraft noise event, usually 10 to 30 seconds, the SEL value is typically about 10 decibels higher than the L_{max} . The SEL values of the Correlated Aircraft Noise Events are added up and used to calculate average noise level metrics over longer periods, including annual or monthly Lden & Lnight, or monthly or summer Leq16 & Leq8.
Single Event noise metrics	Including L_{max} and SEL, these measure the noise of individual events. Along with the (daily or hourly) number of events at each noise level, these metrics provide a different perspective attempting to quantify the various experiences of individuals near flight paths.
Time-Averaged noise levels	Including Annual Lden and Lnight and Summer Leq16/8h, averaged noise levels allow the comparison of different locations around an airport, (and also other airports) where aircraft types, power settings, overflight frequency, operational time of day, and tracks heights vary. The EU and WHO uses Lden and Lnight to assess the total impact on communities for road, rail and air transport noise.
Total Noise	Total Noise is a measure of noise from all noise sources (including aircraft and non-aircraft activity) during the period. This means that Aircraft Noise cannot exceed Total Noise.
Uptime (%)	The percentage of time that each monitor (NMT) was operational during the period.
YTD	Year to date

Noise Monitoring Terminal (NMT) Locations

#	NMT Name	Since
1	Bay Lane	2021
2	St. Doolaghs	2021
3	Bishopswood	2021
4	Feltrim	2021
5	Balcultry	2021
6	St.Davids	2021
7	Swords	Q2 2022
8	Malahide	Q2 2022
10	St.Margarets NS	Q3 2022
20	Coast Rd (OP)	2021
26	Kilcoskan NS	Q4 2022
27	Summerhill	Q3 2023
28	Newpark	Q3 2023
29	Ashbourne	Q3 2023
30	Roundwood	Q4 2023
31	Dunboyne	Q3 2023
32	Donabate	Q4 2023
33	Ardgillan	Q4 2023
204	Milhead	Q3 2023
205	Boroimhe	Q1 2024
206	Ratoath	Q1 2024

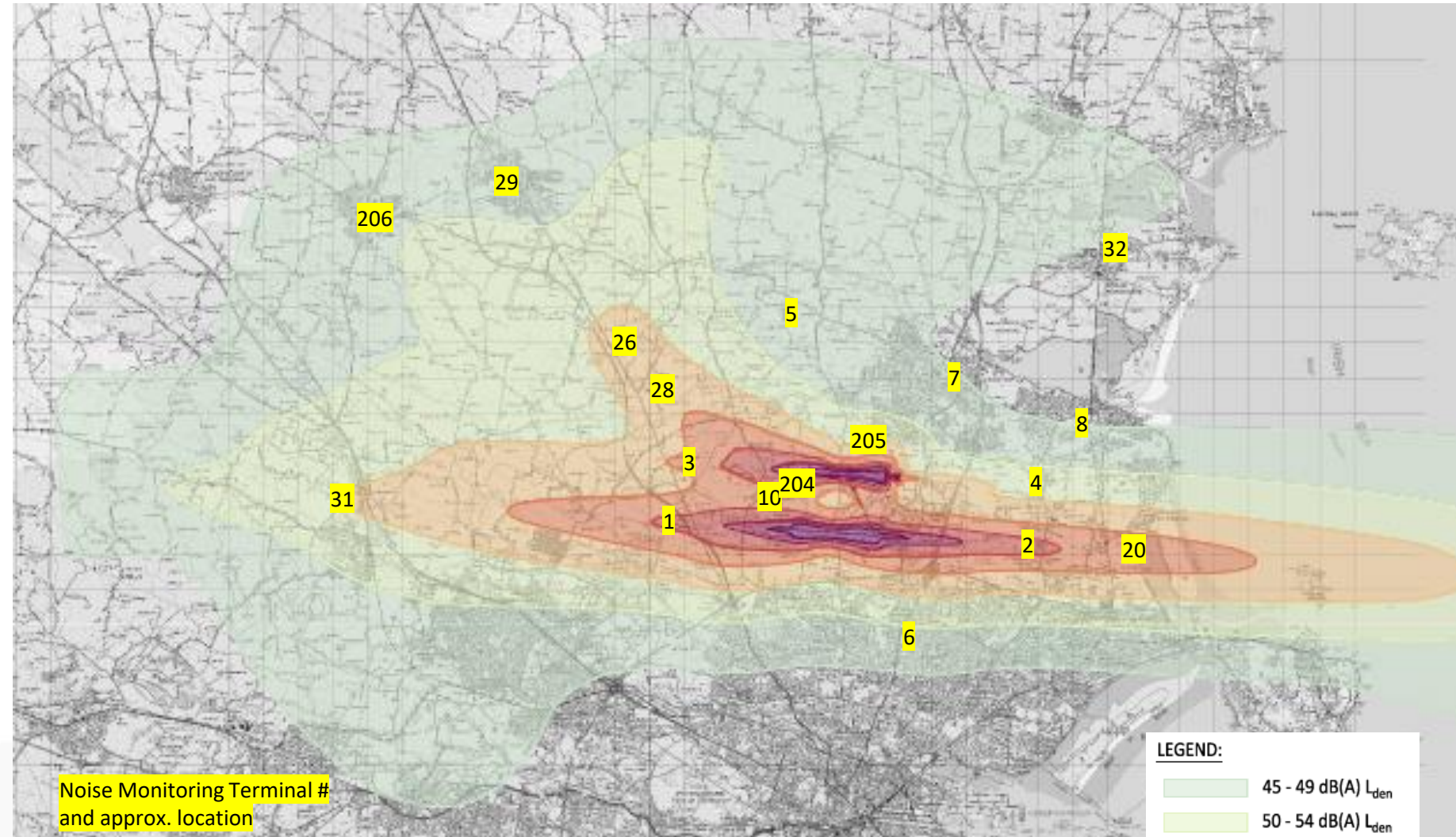


● = NMTs located near Dublin Airport

● = NMTs located further out from Dublin Airport

Modelled Lden Noise Contour Levels at NMT Locations

#	NMT Name	Lden 2023
1	Bay Lane	65
2	St. Doolaghs	65
3	Bishopswood	60
4	Feltrim	54
5	Balcultry	49
6	St.Davids	44
7	Swords	45
8	Malahide	46
10	St.Margarets NS	63
20	Coast Rd (OP)	63
26	Kilcoskan NS	58
27	Summerhill	38
28	Newpark	60
29	Ashbourne	49
30	Roundwood	36
31	Dunboyne	54
32	Donabate	45
33	Ardgillan	33
204	Milhead	67
205	Boroimhe	54
206	Ratoath	47



Map of 2023 Lden Annual Noise contours

3 NMT (27, 30, 33) are located outside this map's boundaries

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}

NMT – Operational Uptime and Number of Correlated Aircraft Noise Events



NMT	Location	Jan			Feb			Mar			Q1 2024
		% Uptime	Downtime (mins)	# Aircraft Events	% Uptime	Downtime (mins)	# Aircraft Events	% Uptime	Downtime (mins)	# Aircraft Events	# Aircraft Events
1	Bay Lane	99.982%	7.98	1458	99.988%	5.00	1373	99.973%	12.00	2509	5340
2	St. Doolaghs	99.987%	5.98	8084	99.995%	2.00	7971	99.973%	12.00	8919	24974
3	Bishopswood	99.971%	12.97	4610	99.976%	9.98	4105	99.955%	20.00	5128	13843
4	Feltrim	99.989%	4.99	1005	99.993%	3.00	818	99.975%	11.00	2170	3993
5	Balcultry	99.852%	65.86	31	99.899%	42.37	24	99.980%	9.00	27	82
6	St.Davids	99.989%	4.99	41	99.998%	1.00	44	99.978%	10.00	83	168
7	Swords	100.0%	0.00	17	99.844%	65.07	34	99.960%	17.75	45	96
8	Malahide	100.0%	0.00	102	99.954%	19.42	40	99.962%	16.97	117	259
10	St.Margarets NS	97.685%	1033.33	3702	97.685%	966.67	5554	97.685%	1033.33	4721	13977
20	Coast Rd (OP)	99.987%	5.98	7615	99.950%	21.00	7681	99.971%	13.00	8028	23324
26	Kilcoskan NS	99.901%	43.99	5284	100.0%	0.00	5436	99.980%	9.00	4079	14799
27	Summerhill	100.0%	0.00	18	99.923%	32.18	19	99.962%	17.07	65	102
28	Newpark	100.0%	0.00	5364	99.918%	34.19	5194	99.960%	17.73	4811	15369
29	Ashbourne	100.0%	0.00	195	99.850%	62.44	234	99.963%	16.42	266	695
30	Roundwood	100.0%	0.00	2	99.851%	62.33	0	99.964%	16.22	0	2
31	Dunboyne	100.0%	0.00	388	99.845%	64.87	428	99.960%	17.67	1398	2214
32	Donabate	100.0%	0.00	13	99.953%	19.81	9	99.959%	18.38	21	43
33	Ardgillan	100.0%	0.00	7	99.923%	32.33	11	99.872%	57.27	10	28
204	Milhead	99.982%	8.04	6801	99.865%	56.37	6443	99.962%	17.15	6669	19913
205	Boroimhe	(See notes on this monitor on Page 16)						99.892%	48.08	210	
9	206	Ratoath						99.960%	17.67	966	

NMT – Q1 Monthly and Quarterly Lden, Lnight and Leq16hr

NMT	Location	# Correlated Aircraft Noise Events				Lden (dBA)				Lnight (=Leq 8h) (dBA)				Leq16h (dBA)			
		Jan	Feb	Mar	Q1	Jan	Feb	Mar	Q1	Jan	Feb	Mar	Q1	Jan	Feb	Mar	Q1
1	Bay Lane	1458	1373	2509	5340	62.7	62.7	65.4	63.8	57.1	57.0	59.3	57.9	51.2	52.4	57.8	54.9
2	St. Doolaghs	8084	7971	8919	24974	63.6	64.0	64.0	63.9	55.7	56.1	56.0	55.9	60.3	60.8	61.1	60.7
3	Bishopswood	4610	4105	5128	13843	58.1	57.2	58.5	58.0	48.2	46.4	44.4	46.6	57.1	56.7	58.6	57.5
4	Feltrim	1005	818	2170	3993	53.1	46.1	53.0	51.8	45.9	35.6	46.1	44.5	48.3	45.6	48.7	47.8
5	Balcultry	31	24	27	82	41.1	38.5	37.0	39.2	27.3	29.0	23.7	27.1	38.4	36.1	36.3	37.1
6	St.Davids	41	44	83	168	37.5	35.1	39.8	37.9	23.1	0.0	29.5	25.7	38.6	36.2	39.5	38.3
7	Swords	17	34	45	96	34.2	35.7	39.4	37.1	9.6	23.3	0.0	18.5	35.7	36.3	38.0	36.8
8	Malahide	102	40	117	259	40.8	28.9	41.4	39.6	34.7	17.1	34.0	32.8	33.6	28.4	36.1	33.8
10	St.Margarets NS	3702	5554	4721	13977	62.3	64.3	62.7	63.2	55.2	57.4	55.6	56.2	58.0	60.0	58.9	59.0
20	Coast Rd (OP)	7615	7681	8028	23324	62.1	62.3	61.7	62.0	53.7	54.0	53.3	53.7	59.2	59.5	59.3	59.3
26	Kilcoskan NS	5284	5436	4079	14799	59.5	60.0	59.1	59.5	32.7	32.0	34.2	33.1	60.4	60.8	59.8	60.3
27	Summerhill	18	19	65	102	30.4	32.5	35.1	33.1	21.6	14.7	25.7	22.7	29.6	33.4	34.4	32.9
28	Newpark	5364	5194	4811	15369	61.0	60.6	59.9	60.5	34.6	32.6	34.9	34.2	61.6	61.3	60.7	61.2
29	Ashbourne	195	234	266	695	37.8	38.6	39.2	38.6	25.8	14.1	21.1	22.6	37.9	39.3	39.9	39.1
30	Roundwood	2	0	0	2	19.4	6.4	6.4	15.1	0.0	0.0	0.0	0.0	21.0	0.0	0.0	16.4
31	Dunboyne	388	428	1398	2214	47.7	46.6	52.5	49.8	42.0	40.6	46.6	43.9	37.3	39.6	43.8	41.1
32	Donabate	13	9	21	43	31.1	27.5	36.6	33.4	0.0	12.7	14.1	11.8	32.3	28.8	34.6	32.6
33	Ardgillan	7	11	10	28	23.8	30.6	33.2	30.6	13.5	21.7	13.5	17.9	23.9	29.9	30.7	29.0
204	Milhead	6801	6443	6669	19913	66.2	66.2	65.8	66.1	47.9	48.0	47.9	47.9	66.8	66.7	66.3	66.6
205	Boroimhe	-		(210)	(See notes on this monitor on Page 16)												
206	Ratoath	-		966				44.9					26.8				45.9

Q1 2024 Aircraft Noise Events and Noise Levels (Lden/Lnight)

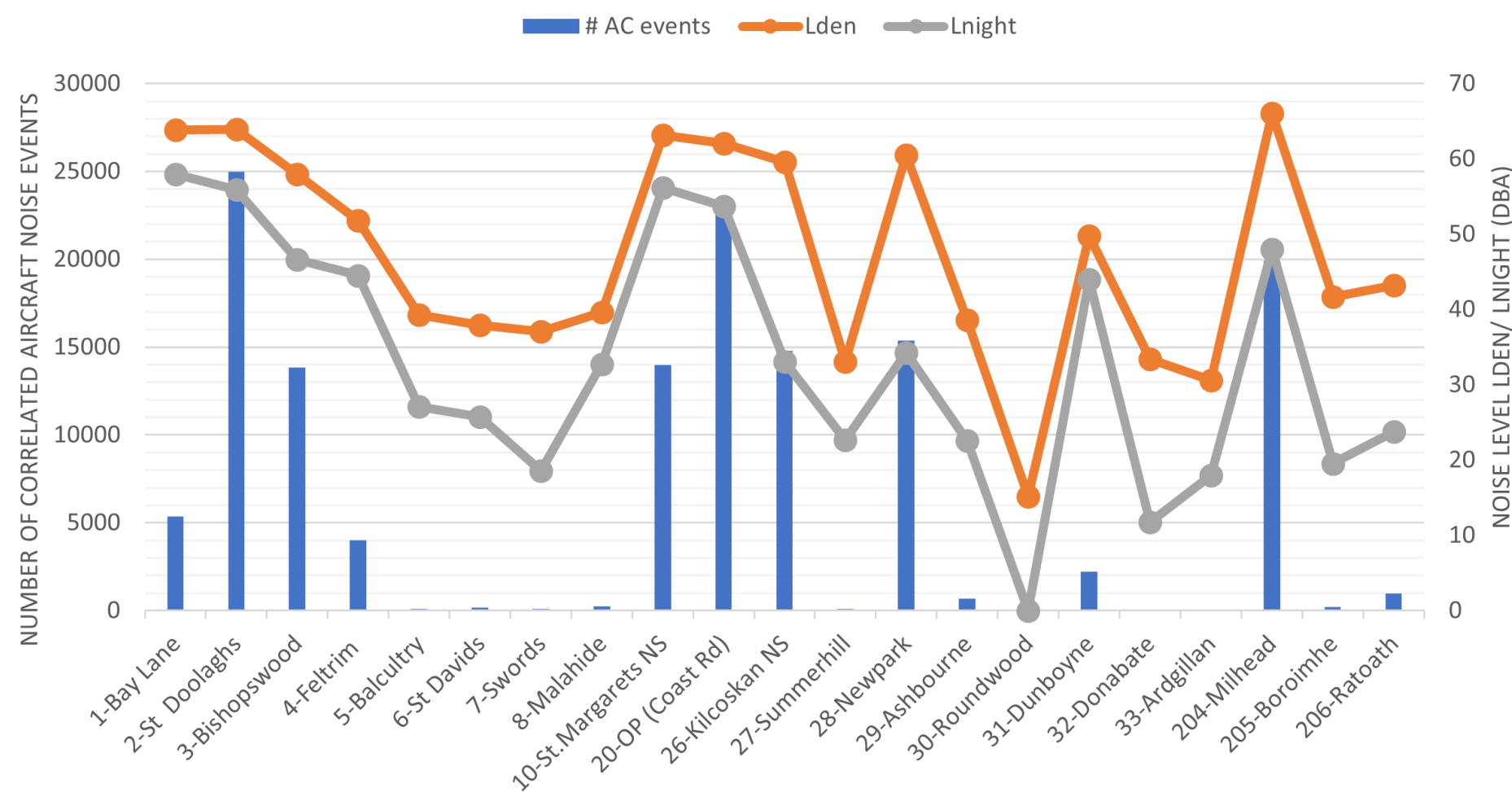


Chart Notes:

Base (x-axis) shows the location of the NMT

Blue Bar shows the number of correlated aircraft noise events. Note: Ratoath data is for one month only

Orange Line shows Lden at each monitor.

Grey Line shows Lnight at each monitor.

NMT – 2023 and 2024 (YTD) Quarterly Measured Lden, Lnight & Leq16hr



NMT	Location	Lden (dBA) [Modelled Contour and Measured Noise]							Lnight (=Leq 8h) (dBA) [Modelled Contour and Measured]							Leq16h (dBA)				
		'23 Cont'r	'23 NMT	2024					'23 Cont'r	'23 NMT	2024					2024				
				Q1	Q2	Q3	Q4	Year			Q1	Q2	Q3	Q4	Year	Q1	Q2	Q3	Q4	2024
1	Bay Lane	65	64.3	63.8					58	56.8	57.9					54.9				
2	St. Doolaghs	65	64.5	63.9					57	56.9	55.9					60.7				
3	Bishopswood	60	57.5	58.0					49	46.1	46.6					57.5				
4	Feltrim	54	51.1	51.8					46	43.7	44.5					47.8				
5	Balcultry	49	46.6	39.2					39	18.8	27.1					37.1				
6	St.Davids	44	38.5	37.9					36	25.0	25.7					38.3				
7	Swords	45	44.7	37.1					37	17.7	18.5					36.8				
8	Malahide	46	38.4	39.6					38	26.2	32.8					33.8				
10	St.Margarets NS	63	63.5	63.2					55	56.5	56.2					59.0				
20	Coast Rd (OP)	63	62.5	62.0					55	54.9	53.7					59.3				
26	Kilcoskan NS	58	59.1	59.5					40	35.8	33.1					60.3				
27	Summerhill	38	31.7	33.1					31	24.9	22.7					32.9				
28	Newpark	60	61.9	60.5					45	34.5	34.2					61.2				
29	Ashbourne	49	45.9	38.6					39	23.9	22.6					39.1				
30	Roundwood	36	12.8	15.1					28	0.0	0.0					16.4				
31	Dunboyne	54	50.5	49.8					47	43.0	43.9					41.1				
32	Donabate	45	0.0	33.4					37	0.0	11.8					32.6				
33	Ardgillan	33	26.5	30.6					24	19.3	17.9					29.0				
204	Milhead	67	65.0	66.1					51		47.9					66.6				
205	Boroimhe	54	(See notes on this monitor on Page 16)																	
206	Ratoath	47		44.9							26.8					45.9				

Column Notes:

- 2023 Contour data is taken from the Annual Noise Contour model.
- 2023 NMT data is the measured Aircraft Noise data.
- 2024 Quarterly data will be added here each quarter.
- There are no Leq16h annual contours (they are only modelled for the Summer period.)

Total Noise versus Aircraft Noise Q4 2023 and Q1 2024

NMT	Location	Lden Q4 2023			Lden Q1 2024		
		Total Noise (dBA)	Aircraft Noise (dBA)	# Aircraft Noise Events	Total Noise (dBA)	Aircraft Noise (dBA)	# Aircraft Noise Events
1	Bay Lane	65.5	63.6	4769	65.8	63.8	5340
2	St. Doolaghs	65.6	64.3	22706	65.1	63.9	24974
3	Bishopswood	64.8	58.2	15473	65.4	58.0	13843
4	Feltrim	61.9	52.1	3699	62.6	51.8	3993
5	Balcultry	61.3	38.7	87	62.1	39.2	82
6	St.Davids	65.7	36.9	119	65.7	37.9	168
7	Swords	65.4	38.8	121	63.9	37.1	96
8	Malahide	60.3	36.6	260	61.8	39.6	259
10	St.Margarets NS	67.1	63.7	18270	67.5	63.2	13977
20	Coast Rd (OP)	67.2	62.5	25153	66.7	62.0	23324
26	Kilcoskan NS	63.7	60.2	17000	63.5	59.5	14799
27	Summerhill	60.1	31.7	85	60.1	33.1	102
28	Newpark	65.8	61.4	19089	66.0	60.5	15369
29	Ashbourne	61.5	47.2	925	60.4	38.6	695
30	Roundwood	62.8	12.3	1	60.4	15.1	2
31	Dunboyne	60.5	50.7	1852	60.5	49.8	2214
32	Donabate	55.4	33.1	26	57.7	33.4	43
33	Ardgillan	58.5	26.5	6	57.7	30.6	28
204	Milhead	67.8	66.5	22853	67.6	66.1	19913
205	Boroimhe				58.1	(See p16)	210 (March)
206	Ratoath				58.6	44.9	966 (March)

- Total noise includes all noise sources detected at the NMT.
- Aircraft noise only includes noise events that are correlated with the flight radar and time of aircraft operational events – i.e. arrivals and departures at Dublin Airport.

Q1 2024 Lmax and SEL Number Above (NA) data (Daily Average)



NMT	Location	Average Number of Aircraft Noise Events per DAY Above Lmax (dBA) [e.g. N60 = Number of events above Lmax 60dBA]						# Aircraft N Events / DAY	Average Number of Aircraft Noise Events per DAY Above SEL [e.g. N(SEL)70 = Number of events above SEL 70dBA]						# Aircraft N Events
		N60	N65	N70	N75	N80	N85		(Av day Q1)	N(SEL)70	N(SEL)75	N(SEL)80	N(SEL)85	N(SEL)90	
1	Bay Lane	58.4	58.4	57.3	46.4	18.6	0.4	58.7	58.4	58.2	56.5	45.4	6.3	0.1	5340
2	St. Doolaghs	274.2	274.2	255.8	140.1	3.8	0.2	274.4	274.2	273.1	250.2	90.1	2.8	0.0	24974
3	Bishopswood	152.1	152.1	118.3	38.9	1.7	0.1	152.1	152.1	149.8	112.1	31.2	1.6	0.1	13843
4	Feltrim	43.9	38.5	9.9	2.7	0.3	0.0	43.9	43.7	33.5	8.7	2.2	0.3	0.0	3993
5	Balcultry	0.9	0.7	0.4	0.2	0.1	0.0	0.9	0.9	0.7	0.4	0.2	0.1	0.0	82
6	St.Davids	1.5	1.5	0.9	0.2	0.1	0.0	1.8	1.5	1.5	0.6	0.2	0.1		168
7	Swords	1.0	0.9	0.6	0.3	0.1		1.1	1.0	0.8	0.7	0.3	0.1		96
8	Malahide	2.5	1.5	0.4	0.1	0.0		2.8	2.4	1.3	0.4	0.1	0.0		259
10	St.Margarets NS	153.8	148.9	141.7	86.5	8.3	0.1	153.6	152.8	148.8	137.8	84.9	5.4	0.0	13977
20	Coast Rd (OP)	256.2	256.2	232.3	27.6	0.9	0.1	256.3	256.2	256.2	236.3	33.5	1.2	0.0	23324
26	Kilcoskan NS	162.6	158.4	145.7	71.3	6.7	0.1	162.6	162.3	158.9	149.6	84.6	8.8	0.0	14799
27	Summerhill	0.7	0.6	0.1	0.0			1.1	0.7	0.4	0.1	0.0			102
28	Newpark	168.8	168.0	143.3	100.9	12.0	0.7	168.9	168.8	159.1	140.7	106.4	9.4	0.3	15369
29	Ashbourne	7.7	7.2	1.5	0.1			7.6	7.7	4.6	1.3	0.1			695
30	Roundwood	0.0	0.0	0.0				0.0	0.0	0.0	0.0				2
31	Dunboyne	24.0	21.3	3.3	0.1	0.0	0.0	24.3	23.9	17.8	3.0	0.1			2214
32	Donabate	0.4	0.4	0.2	0.1	0.0		0.5	0.4	0.3	0.2	0.1	0.0		43
33	Ardgillan	0.2	0.2	0.1	0.0	0.0		0.3	0.2	0.1	0.1	0.0	0.0		28
204	Milhead	218.1	217.0	213.0	175.2	123.0	45.7	218.8	217.8	216.8	203.5	145.8	104.6	10.5	19913
205	Boroimhe (March)	(See notes on this monitor on Page 16)													
206	Ratoath (March)	31.2	24.1	4.7	1.1	0.3	0.0	32 (March)	30.6	24.3	5.0	0.9			966 (March)

Q1 2024 Lmax and SEL Percentages in 5-decibel bands (3 months)



NMT	Location	Percentage of Aircraft Noise Events in each Lmax Range (dBA)						# Aircraft N Events /DAY	Percentage of Aircraft Noise Events in each SEL Range (dBA)						# Aircraft N Events
		60-64.9	65-69.9	70-74.9	75-79.9	80-84.9	85-89.9	(Av day Q1)	70-74.9	75-79.9	80-84.9	85-89.9	90-94.9	95-99.9	(Total in Q1)
1	Bay Lane		2%	19%	48%	31%	0.6%	58.7	0%	3%	19%	67%	10.7%	0.2%	5340
2	St. Doolaghs	0%	7%	42%	50%	1%	0.1%	274.4	0%	8%	58%	32%	1.0%	0.0%	24974
3	Bishopswood		22%	52%	24%	1%	0.1%	152.1	2%	25%	53%	19%	1.0%	0.0%	13843
4	Feltrim	12%	65%	16%	6%	1%	0.0%	43.9	23%	57%	15%	4%	0.7%	0.1%	3993
5	Balcultry	16%	33%	33%	8%	6%	2.5%	0.9	16%	43%	19%	15%	5.1%	1.3%	82
6	St.Davids	1%	42%	43%	5%	7%	1.4%	1.8	5%	53%	27%	9%	6.5%		168
7	Swords	9%	28%	33%	22%	8%		1.1	14%	17%	39%	22%	5.6%		96
8	Malahide	36%	41%	11%	2%	0%		2.8	41%	34%	13%	2%	0.4%		259
10	St.Margarets NS	3%	5%	36%	51%	5%	0.1%	153.6	3%	7%	34%	52%	3.5%	0.0%	13977
20	Coast Rd (OP)		9%	80%	10%	0%	0.0%	256.3		8%	79%	13%	0.5%	0.0%	23324
26	Kilcoskan NS	3%	8%	46%	40%	4%	0.0%	162.6	2%	6%	40%	47%	5.4%	0.0%	14799
27	Summerhill	19%	61%	16%	3%			1.1	42%	45%	4%	4%			102
28	Newpark	0%	15%	25%	53%	7%	0.4%	168.9	6%	11%	20%	57%	5.4%	0.2%	15369
29	Ashbourne	7%	74%	17%	2%			7.6	40%	43%	15%	2%			695
30	Roundwood			100%				0.0			100%				2
31	Dunboyne	12%	75%	13%	1%		0.1%	24.3	25%	62%	12%	0%			2214
32	Donabate	9%	31%	34%	20%	6%		0.5	23%	20%	31%	23%	2.9%		43
33	Ardgillan	25%	40%	20%	5%	10%		0.3	35%	30%	15%	10%	5.0%		28
204	Milhead	1%	2%	17%	24%	35%	18.9%	218.8	0%	6%	26%	19%	43.0%	4.7%	19913
205	Boroimhe (March)	(See notes on this monitor on Page 16)													
206	Ratoath (March)	23%	62%	12%	3%	1%	0%	32 (March)	20%	62%	13%	3%	0%	0%	966 (March)

- A portable noise monitor was installed at Boroimhe in February 2024.
- This location is just 1km north of the North Runway. The location is not typically subject to overflights.
- Residents have expressed concern over the noise from aircraft departing on this runway heading west. High engine power is required to accelerate an aircraft down the runway to achieve take-off speed. This is referred to as Start-of-Roll (SOR) noise.
- Unlike the noise from aircraft when taxiing on taxiways, SOR is included as part of the aircraft departure procedures. This means it is included in the aircraft noise modelling and the Annual and Summer noise contours.
- Since its installation, the NMT 205 at Boroimhe has been collecting Noise Event data, but there seems to have been a problem with the noise data management system linking the aircraft departures events with the measured Noise Events. This means that there have not been as many Correlated Aircraft Noise Events at NMT 205 as might have been expected.
- The Noise Team at Dublin Airport has been investigating this issue. The NMT system is designed and fine-tuned for capturing aircraft noise from overhead flight movements, and not necessarily for SOR noise. The radar track data that needs to be matched to measured noise events does not commence until the aircraft has left the ground, and this may be why a significant number of departures are not being correlated.
- The monitor will stay in place until the issue is resolved which may take two to three months until a good sample of noise data is collected.
- Regardless of the radar issue, the Total noise measurement at Boroimhe includes all SOR noise and the Noise Team is investigating ways to extract the SOR noise from the existing data. Until a robust and reliable method is achieved, it has been decided to publish the Quarterly Report without the Boroimhe data and then to provide more reliable data when it is available.



Part 2: Flight Track Monitoring



Page	Page Heading	Page Content
19	Overview Narrative	
20	Standard Instrument Departures (SID) North Runway	AirNav Ireland maps displaying the departure SIDs from North Runway towards the West and the East.
21	Standard Instrument Departures (SID) South Runway	AirNav Ireland maps displaying the departure SIDs from South Runway towards the West and the East.
22	Busy day Flight Tracks - Westerly and Easterly Operations	Examples of a typical 'busy day' flight pattern
23	Noise Contour Modelling (1) – Core Flight Tracks	Explanation of how noise contours are modelled using core flight tracks
24	Noise Contour Modelling (2) – Dispersed Flight Tracks	Explanation of how noise contours are modelled using dispersed flight tracks
25	Conclusion	

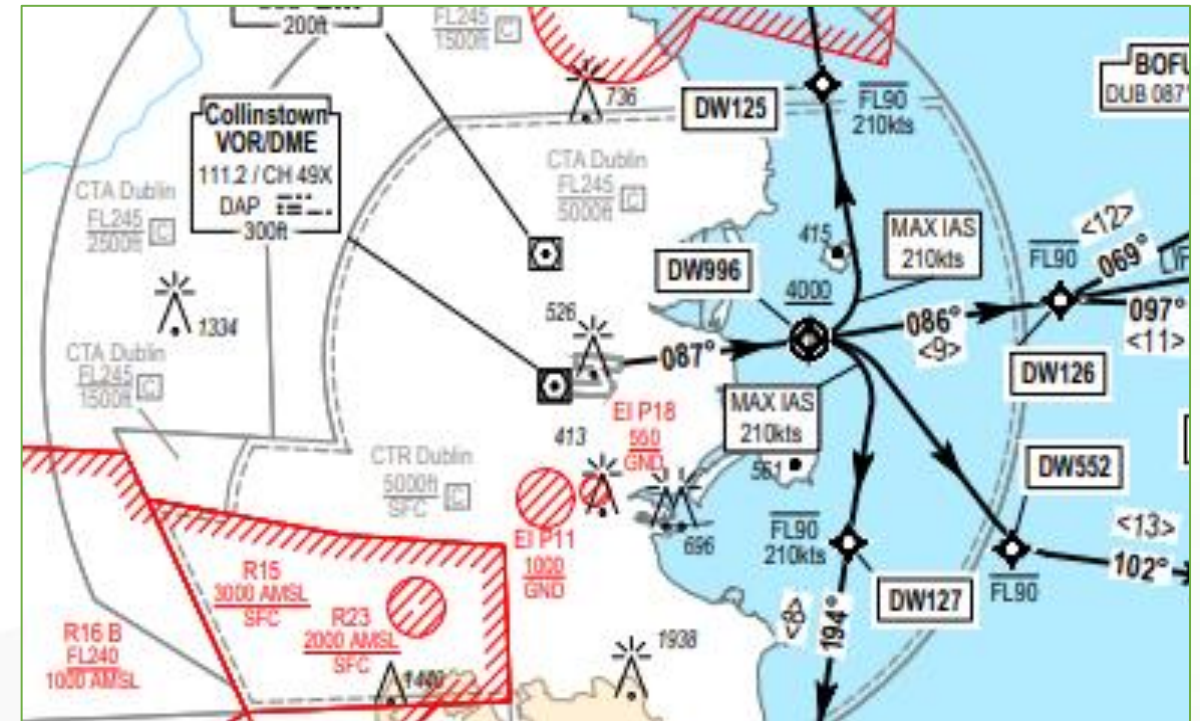
Term	Definition/ Explanation
Arrival Tracks	Arriving aircraft must fly in a straight line for at least the final 11km of their approach before landing on the runway. Aircraft approach the airport at a precise downward angle of 3 degrees, which means that they are at a height of 1,800ft when they join the final approach at the 11km point.
Departure Tracks	Departing jet aircraft are required to follow procedures defined by the SID and to stay within the Environmental Corridor, also called the Noise Preferential Route (NPR), below 3000ft for the South Runway and below 4000ft for the North Runway, unless directed by Air Traffic Control.
Easterly vs Westerly Operations	<p>In general, aircraft land and take-off facing into the wind.</p> <p>If the wind is easterly (blowing from the east), aircraft land from the west and take-off towards the east.</p> <p>If the wind is westerly (blowing from the west), aircraft land from the east (over the Irish Sea) and take-off towards the west.</p> <p>A moderate cross-wind component can be tolerated, but a strong north or south wind will require the use of the Crosswind Runway.</p>
Standard Instrument Departure (SID)	Depending on the departure runway and final destination, departing aircraft follow routes called Standard Instrument Departures (SID). SIDs allow aircraft to safely depart an airspace following pre-defined routes. (See Pages 20 and 21)
Flight Track	A flight track is the actual path flown by an aircraft (as opposed to a route or SID which indicate where an aircraft should go.) Flight track monitoring is based on flight radar data that is incorporated into the Noise and Flight Track Monitoring System.
Noise Modelling	A computer program is used to model airport operations and calculate the noise contours. Input data include all aircraft operations, aircraft types, runway use, time of day and flight tracks.
Modelled Flight Track	Arrival noise is dominated by the straight final approach which is relatively easy to model for the noise contour calculations. Departing aircraft generally follow the SID
Track Dispersion	In practice there is a spread or dispersion of actual tracks flown to either side of a main central track. This is modelled using a central flight track and secondary (dispersed) flight tracks to either side and the operations area divided between these tracks using a normal distribution.

Standard Instrument Departures (SID) North Runway

- Jet aircraft departures are required to follow Standard Instrument Departures (SID).
- SID's are developed taking into account various safety, operational and environmental considerations amongst other elements.



SID for North Runway (28R) departures to the west (westerly operations in westerly winds)



SID for North Runway (10L) departures to the east (easterly operations in easterly winds)

Note: This is only used during periods when the South Runway is closed.

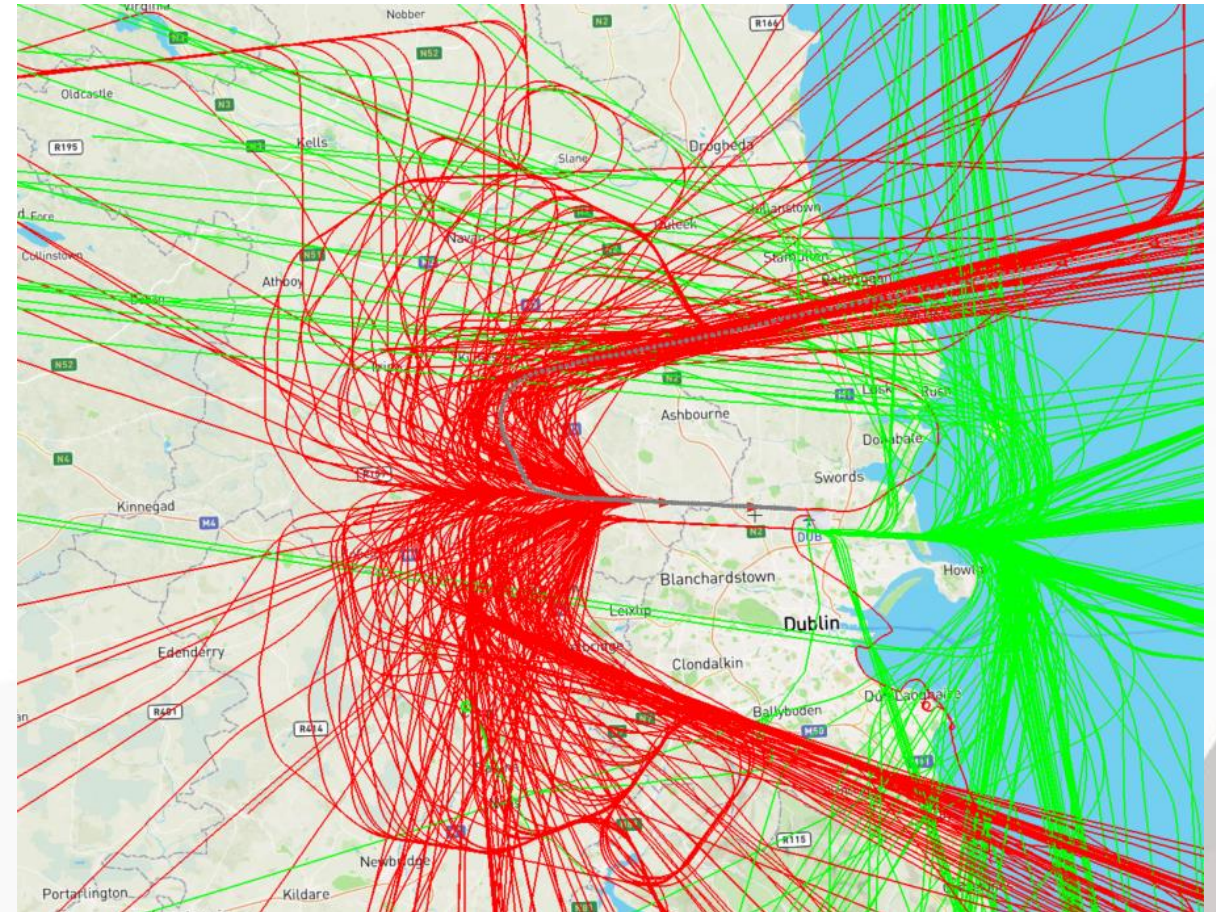
Busy Day Flight Tracks

The above arrival and departure procedures result in the busy day flight patterns depicted below.



Operations on March 15, 2024

- 736 movements, westerly conditions
- Red = arrivals from the east
- Green = departures to the west

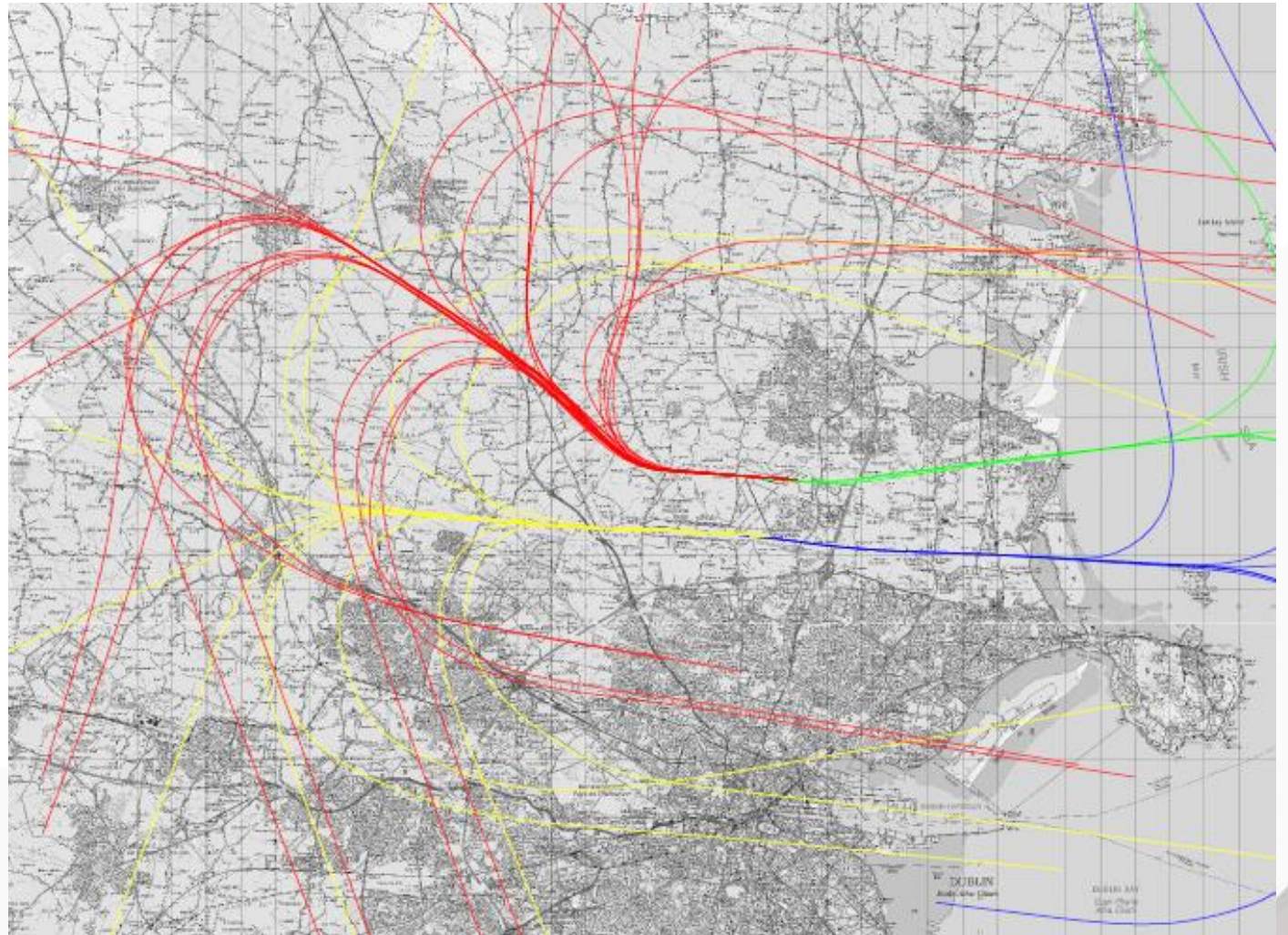


Operations on March 31, 2024

- 665 movements, easterly conditions
- Red = arrivals from the west
- Green = departures to the east

Noise contours are calculated by a computer model based on input of the aircraft operations at the airport. This process includes certain steps including:

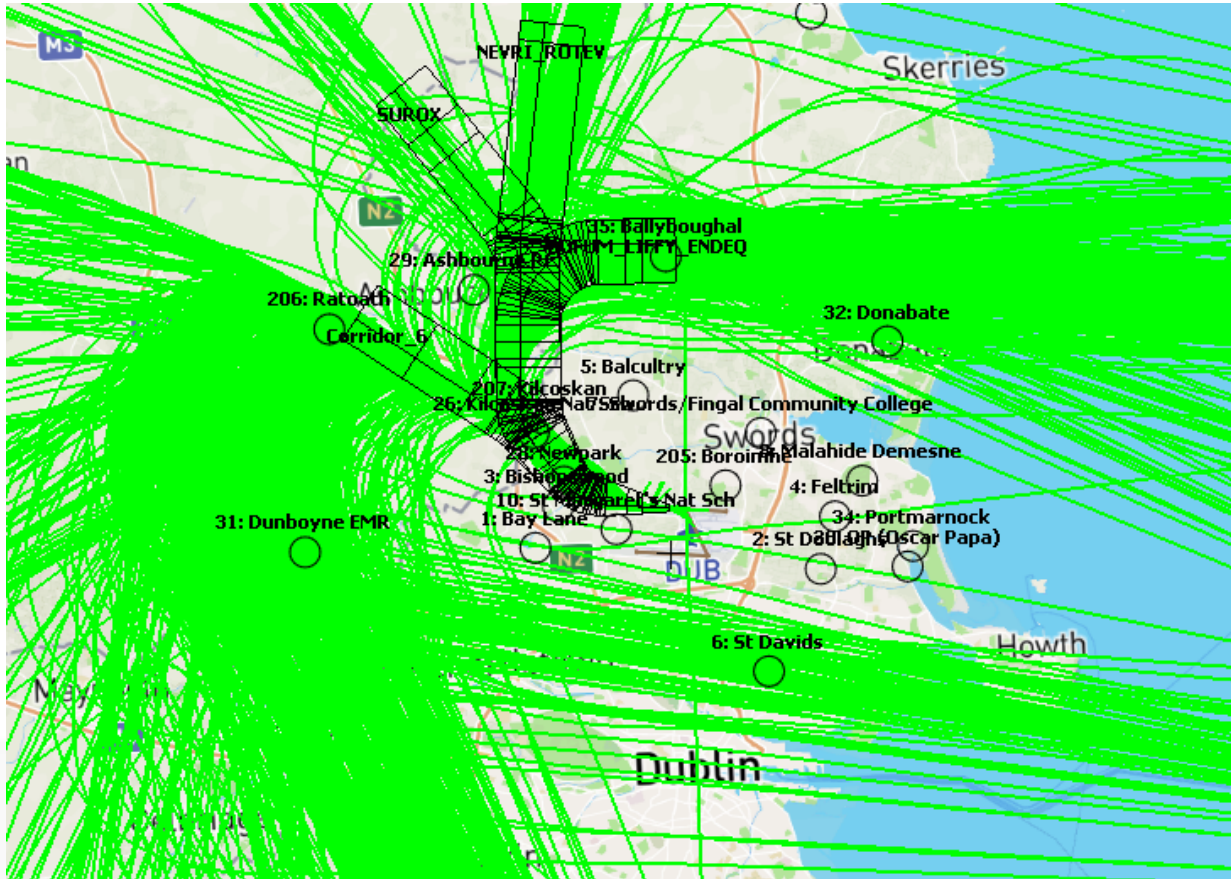
- Flight track data is extracted from the airport's Noise and Flight Track Monitoring system.
- Typical flight tracks are identified for each of the runways (as depicted here)
- Dispersed tracks are then created either side of the central lines to reflect actual operations (as depicted in the next page)



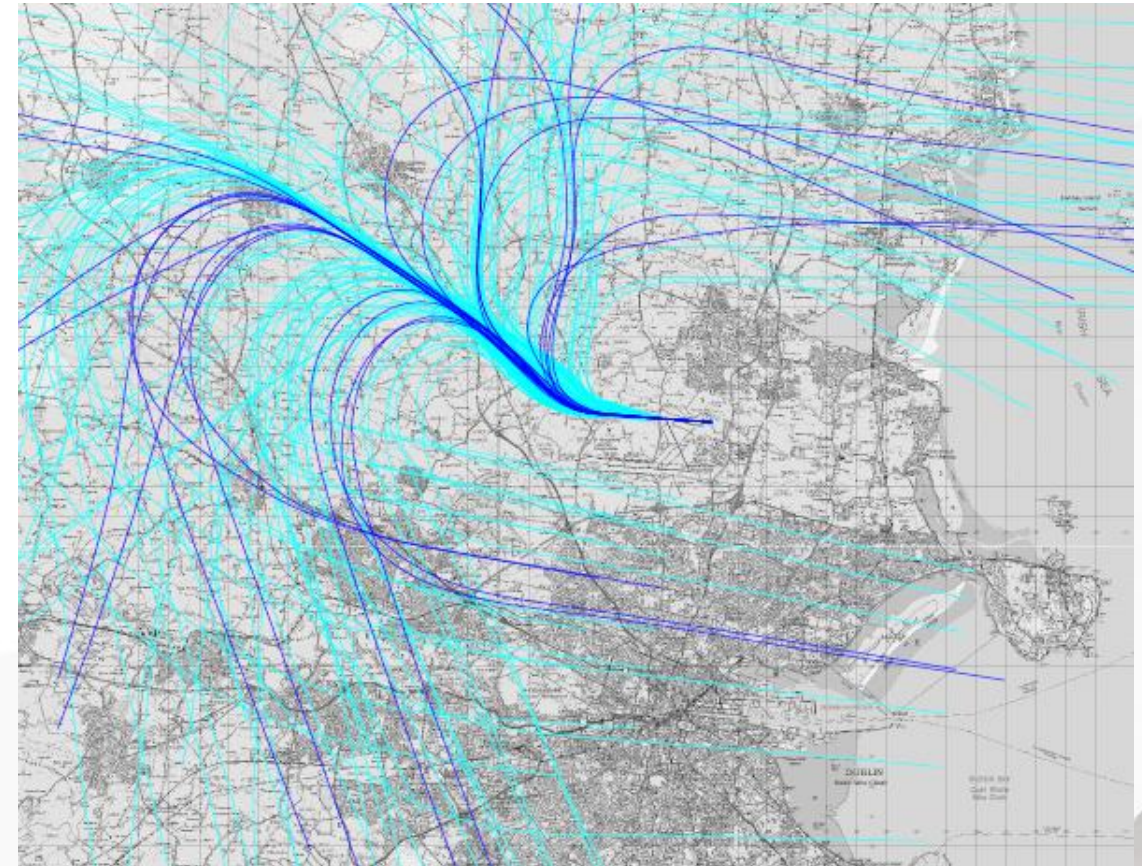
Main departure flight paths in calculation model for the 2 main runways – easterly and westerly departures

Noise Contour Modelling (2) – Dispersed Flight Tracks

In practice, the spread or scatter of actual flight tracks is modelled by creating dispersed tracks either side of the central or main track as shown.



Actual (Monitored) Flight Paths:
North Runway (28R) – westerly departures
1-15 March 2024



Modelled Departure Flight Paths:
North Runway (28R) – westerly operations
Dark blue = centreline flight paths
Light blue = dispersion flight paths

Noise Monitoring

- As at Q1 2024, Dublin Airport had a network of 19 permanent and 2 mobile Noise Monitoring Terminals (NMT), at locations ranging from less than 1 km to over 30 km from the runways.
- NMT locations are selected across a wide area to cover the region including the nearest, most-impacted residences, heavily populated areas and less-impacted, further-out locations.
- Measured aircraft noise data is presented in both time-averaged and single-event noise metrics.

Flight Track Monitoring

- Flight track data is used to positively identify aircraft noise from the NMT data and filter out non-aircraft noise.
- Monitored flight tracks are also used to ensure that the operations in the noise contour model are representative of actual airport activity.
- Airline track adherence is reported in Dublin Airport's monthly operations reports.

Noise Contour Validation

- There is good correlation between the Measured and Modelled aircraft noise levels.
- This demonstrates that the noise modelling is sufficiently representative of the totality of aircraft operations at Dublin Airport and thus that the Modelled noise levels accurately represent community noise exposure levels.
- This means that the contours can be used to assess the noise at locations which do not have an NMT in the immediate vicinity.
- In general, noise impact assessment and mitigations at the airport including Noise Insulation and Dwelling Purchase Schemes are based on the modelled noise contours, so the Noise and Flight Track Monitoring, presented herein, provides support to the assessment and mitigation work at the airport.

End

**For further information, please visit
our website:**

www.dublinairport.com