



Dublin Airport

Quarterly Noise and Flight Track Monitoring Report

July – September (Q3) 2024

including analysis of the 92-day peak summer 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 three parts:
 - Part 1: Noise Monitoring – Permanent monitors
 - Part 2: Noise Monitoring – Temporary monitors
 - Part 3: Flight Track Monitoring
 - Part 4: Noise Monitoring – 92-day Peak Summer period
- Noise data is presented in this report in six different metrics - Lden, Lnight, Leq16h, Leq8h, 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).
- 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.
- The 92-day summer Leq16hr (day) contour is used for the eligibility thresholds for the home and school noise insulation and home purchase schemes.
- 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.
- 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

Permanent NMT

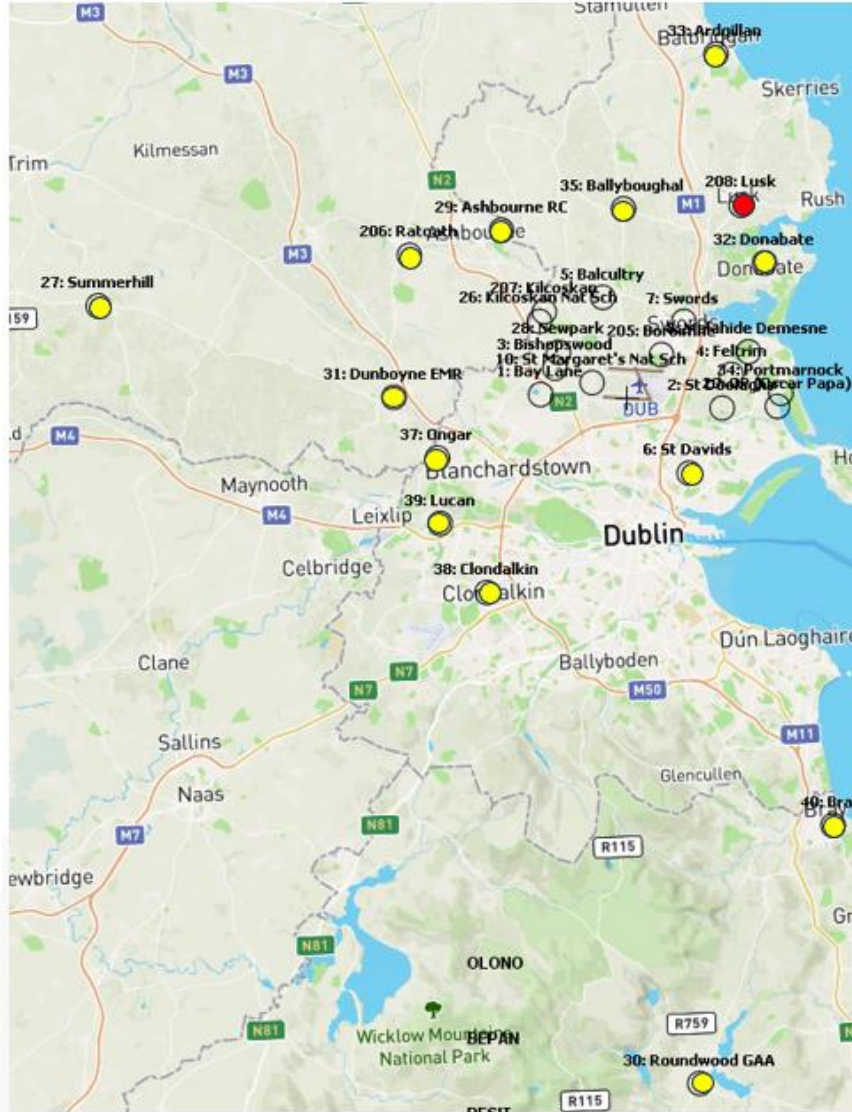


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7	Locations of Noise Monitoring Terminals (NMTs)	<ul style="list-style-type: none"> • Maps indicating locations of active Dublin Airport NMTs • Installation dates of NMTs
8	Modelled Lden Noise Contour Levels at NMT Locations	<ul style="list-style-type: 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 Q3:</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 – Q3 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 – Q3 Aircraft Noise Event and Measured Lden/ Lnight Data	Chart showing Q3 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 • YTD 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 and Q2 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 – Q3 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 – Q3 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	Temporary NMT Introduction	
17 – 18	Temporary NMT data	Measured time-averaged and single event metrics each month of the measurement duration.

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 Leq16hr covers the 92 days from mid-June to mid-September. Leq8h and Lnight cover the same period, 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. Lmax is displayed at each NMT on the Dublin Airport WebTrak site however, it also <u>includes</u> non-aircraft noise.
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

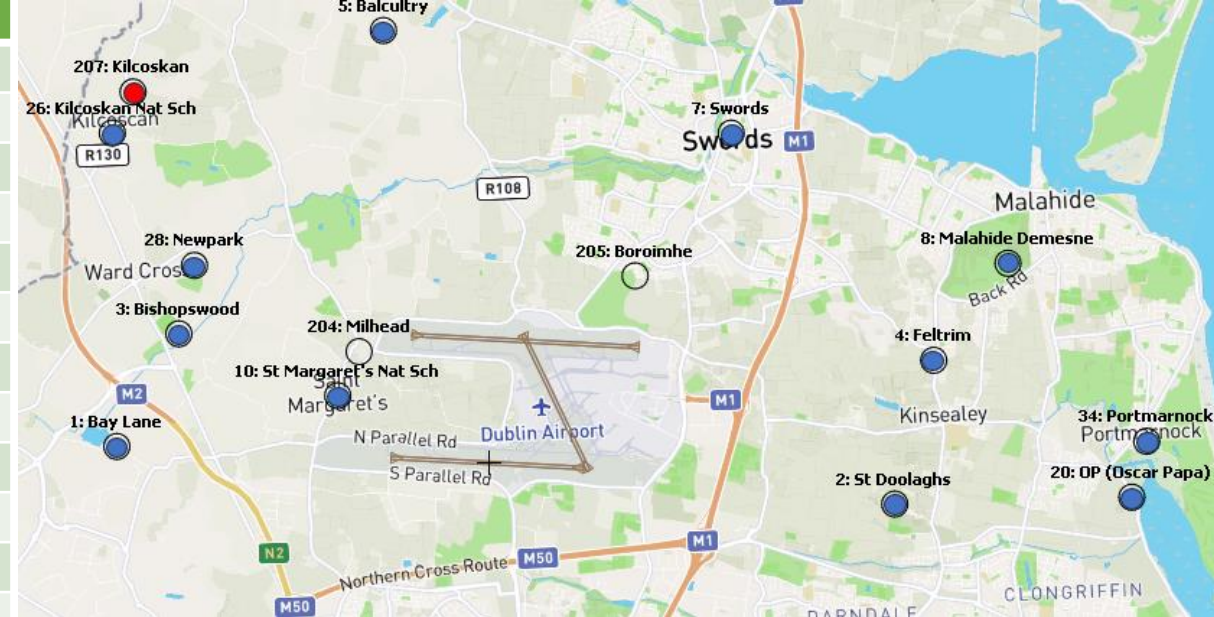
Noise Monitoring Terminal (NMT) Locations Q3 2024



● = Permanent NMTs located further out from Dublin Airport

● = Temporary NMT located further out from Dublin Airport

#	NMT Name	Since
1	Bay Lane	2015
2	St. Doolaghs	2015
3	Bishopswood	2015
4	Feltrim	2015
5	Balcultry	2015
6	St.Davids	2015
7	Swords	07/2022
8	Malahide	07/2022
10	St.Margarets N	07/2022
20	Coast Rd (OP)	2015
26	Kilcoskan NS	12/2022
27	Summerhill	09/2023
28	Newpark	09/2023
29	Ashbourne	09/2023
30	Roundwood	09/2023
31	Dunboyne	09/2023
32	Donabate	09/2023
33	Ardgillan	01/2024
34	Portmarnock	06/2024
35	Ballyboughal	06/2024
37	Ongar	08/2024
38	Clondalkin	08/2024
39	Lucan	08/2024
40	Bray	08/2024
206	Ratoath	03/2024



● = Permanent NMT located near Dublin Airport

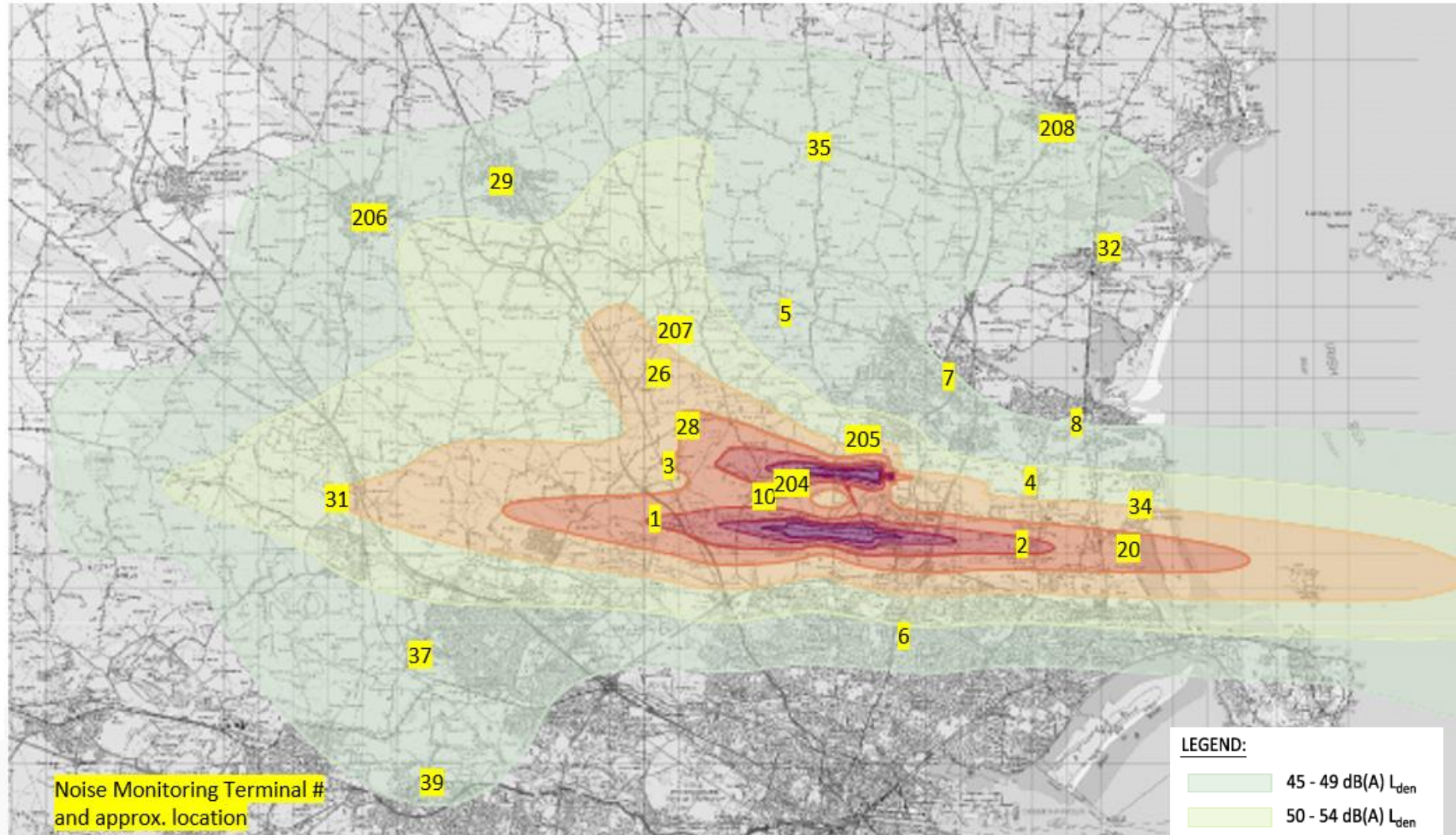
● = Temporary NMT located near Dublin Airport

#	Mobile NMT	From	Until
204	Milhead	Oct 2023	Jun 2024
205	Boroimhe	Mar 2024	July 2024
207	Kilcoscan	Jul 2024	
208	Lusk	Aug 2024	

New NMT 37-40 September only in Q3

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
34	Portmarnock	56
35	Ballyboughal	49
37	Ongar	
38	Clondalkin	48
39	Lucan	46
40	Bray	
206	Ratoath	47
207	Kilcoskan	58
208	Lusk	45



Noise Monitoring Terminal # and approx. location

Map of 2023 Lden Annual Noise contours

6 NMT (27, 30, 33, 38, 39, 40) are located outside this map's boundaries

Including Permanent and Temporary NMT installations

NMT – Operational Uptime and Number of Correlated Aircraft Noise Events



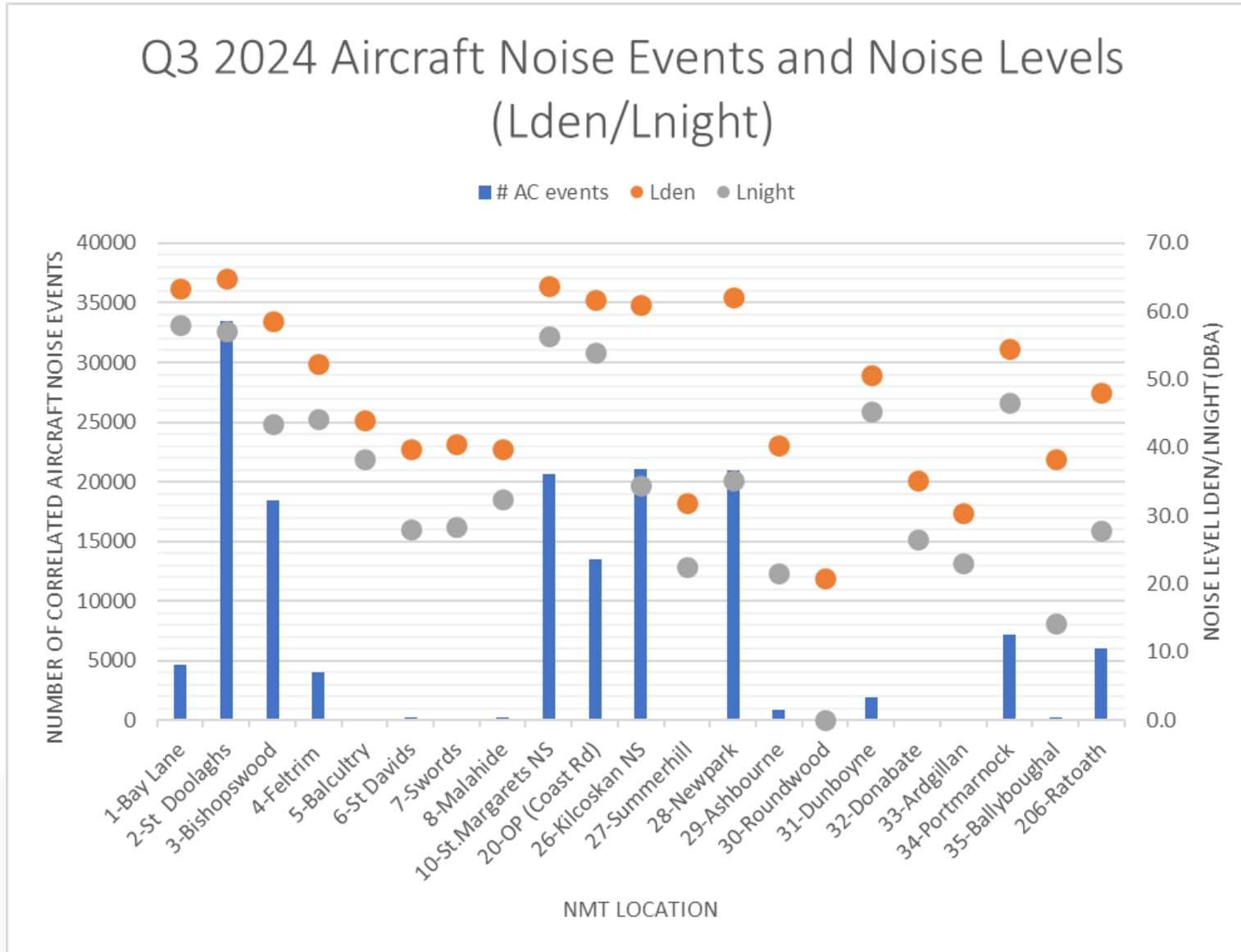
NMT	Location	July			August			September			Q3 2024
		% Uptime	Downtime (mins)	# Aircraft Events	% Uptime	Downtime (mins)	# Aircraft Events	% Uptime	Downtime (mins)	# Aircraft Events	# Aircraft Events
1	Bay Lane	99.901%	44.00	1766	99.996%	2.00	1364	99.986%	6.00	1573	4703
2	St. Doolaghs	99.895%	47.00	11488	99.921%	35.45	11354	99.894%	45.93	10600	33442
3	Bishopswood	99.879%	54.00	6037	99.973%	12.00	5439	99.880%	52.00	6931	18407
4	Feltrim	99.751%	111.16	1330	99.872%	57.00	1322	99.988%	5.00	1351	4003
5	Balcultry	99.809%	85.09	28	99.948%	23.00	46	99.844%	67.56	31	105
6	St.Davids	99.877%	55.00	90	99.728%	121.33	55	99.995%	2.00	111	256
7	Swords	99.945%	24.65	45	99.919%	36.27	53	99.891%	47.13	33	131
8	Malahide	99.962%	16.92	25	99.859%	62.77	225	99.962%	16.47	35	285
10	St.Margarets NS	97.685%	1033.33	7132	97.685%	1033.33	8186	97.685%	1000.00	5325	20643
20	Coast Rd (OP)	99.879%	54.00	10762	100.000%	0.00	2144	100.000%	0.00	624	13530
26	Kilcoskan NS	99.866%	60.00	7058	100.000%	0.00	8722	99.998%	1.00	5312	21092
27	Summerhill	99.962%	16.98	31	99.382%	275.73	30	99.892%	46.78	34	95
28	Newpark	99.892%	48.07	6774	99.960%	17.75	8337	99.953%	20.50	5838	20949
29	Ashbourne	99.963%	16.68	333	99.881%	52.97	390	99.963%	16.02	147	870
30	Roundwood	99.962%	16.77	1	99.759%	107.55	5	99.962%	16.47	0	6
31	Dunboyne	99.963%	16.62	644	99.770%	102.53	384	99.961%	16.95	889	1917
32	Donabate	99.873%	56.60	18	99.961%	17.23	15	99.962%	16.55	13	46
33	Ardgillan	99.963%	16.73	9	99.961%	17.35	10	99.962%	16.55	10	29
34	Portmarnock	99.962%	17.10	2267	99.828%	76.65	2052	99.859%	60.98	2812	7131
35	Ballyboughal	99.850%	66.80	83	99.849%	67.35	104	99.775%	97.00	90	277
37	Ongar							99.849%	65.33	121	
38	Clondalkin							99.851%	64.25	217	
39	Lucan							99.388%	264.22	184	
40	Bray							99.851%	64.27	29	
206	Ratoath	99.833%	74.48	2200	99.962%	16.98	2188	99.876%	53.77	1587	5975

NMT – Q3 Monthly and Quarterly Lden, Lnight and Leq16hr



NMT	Location	# Correlated Aircraft Noise Events				Lden (dBA)				Lnight (=Leq 8h) (dBA)				Leq16h (dBA)			
		Jul	Aug	Sep	Q3	Jul	Aug	Sep	Q3	Jul	Aug	Sep	Q3	Jul	Aug	Sep	Q3
1	Bay Lane	1766	1364	1573	4703	62.9	62.5	64.4	63.3	57.4	57.2	59.1	58.0	51.6	43.1	44.7	48.1
2	St. Doolaghs	11488	11354	10600	33442	64.9	64.8	64.6	64.7	57.4	57.1	56.7	57.1	61.1	61.3	61.4	61.2
3	Bishopswood	6037	5439	6931	18407	58.2	57.8	59.5	58.5	43.4	44.8	41.9	43.5	58.3	57.7	59.7	58.6
4	Feltrim	1330	1322	1351	4003	52.0	54.7	47.8	52.4	37.4	48.5	34.5	44.3	52.7	48.1	47.9	50.2
5	Balcultry	28	46	31	105	36.9	48.2	36.2	44.0	28.6	42.9	19.2	38.4	33.8	31.0	35.3	33.7
6	St.Davids	90	55	111	256	39.6	39.6	40.2	39.8	27.0	27.1	29.6	28.1	39.9	37.5	39.2	39.0
7	Swords	45	53	33	131	40.3	42.0	38.5	40.5	27.1	31.7	13.7	28.3	39.1	38.9	37.7	38.6
8	Malahide	25	225	35	285	39.2	42.5	32.7	39.7	16.5	36.9	24.2	32.4	36.1	31.8	30.2	33.5
10	St.Margarets NS	7132	8186	5325	20643	64.0	64.5	62.2	63.7	56.6	57.3	55.0	56.4	60.3	60.7	58.5	59.9
20	Coast Rd (OP)	10762	2144	624	13530	62.9	63.0	56.9	61.7	55.3	55.4	46.5	53.9	59.4	59.5	56.1	58.6
26	Kilcoskan NS	7058	8722	5312	21092	61.2	61.6	60.0	61.0	24.6	38.4	31.0	34.5	61.6	62.2	60.7	61.6
27	Summerhill	31	30	34	95	31.4	29.5	33.7	31.8	20.2	20.9	24.8	22.4	30.4	28.2	30.2	29.7
28	Newpark	6774	8337	5838	20949	62.3	62.7	61.0	62.1	21.8	39.4	29.7	35.1	62.8	63.2	61.7	62.6
29	Ashbourne	333	390	147	870	40.8	41.8	37.1	40.3	19.6	24.2	18.9	21.6	42.0	43.0	38.0	41.5
30	Roundwood	1	5	0	6	16.0	25.0	6.4	20.8	0.0	0.0	0.0	0.0	17.3	26.7	0.0	22.4
31	Dunboyne	644	384	889	1917	50.5	48.6	52.3	50.7	45.0	43.3	47.0	45.3	39.4	30.2	34.3	36.2
32	Donabate	18	15	13	46	38.0	34.8	25.9	35.1	30.8	21.5	0.0	26.5	32.8	32.7	27.7	31.6
33	Ardgillan	9	10	10	29	24.3	33.3	29.4	30.4	14.7	26.2	22.4	23.1	23.4	28.8	25.8	26.5
34	Portmarnock	2267	2052	2812	7131	54.3	54.0	55.0	54.5	46.0	47.2	46.7	46.7	52.2	49.3	52.5	51.6
35	Ballyboughal	83	104	90	277	38.8	38.2	38.0	38.4	0.0	18.9	0.0	14.3	39.3	39.3	39.5	39.4
37	Ongar			121				41.6				35.7				35.4	
38	Clondalkin			217				38.0				27.8				37.5	
39	Lucan			184				47.0				29.3				48.5	
40	Bray			29				27.8				0.0				29.2	
206	Ratoath	2200	2188	1587	5975	48.7	47.8	47.5	48.0	28.9	26.6	27.9	27.9	49.3	48.4	48.3	48.7

NMT – Q3 2024 Aircraft Noise Event and Measured Lden/Lnight



Including Permanent NMT installations covering entire quarter

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) (See Part 4)				
		'23 Cont	'23 NMT	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2024	'23 Cont	'23 NMT	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2024	Q1 2024	Q2 2024	Q3 2024	Q4 2024	2024
1	Bay Lane	65	64.3	63.8	63.6	63.3			58	56.8	57.9	57.9	58.0			54.9	52.6	48.1		
2	St. Doolaghs	65	64.5	63.9	64.6	64.7			57	56.9	55.9	56.9	57.1			60.7	61.3	61.2		
3	Bishopswood	60	57.5	58.0	58.8	58.5			49	46.1	46.6	44.6	43.5			57.5	58.8	58.6		
4	Feltrim	54	51.1	51.8	52.5	52.4			46	43.7	44.5	46.7	44.3			47.8	44.4	50.2		
5	Balcultry	49	46.6	39.2	45.9	44.0			39	18.8	27.1	37.1	38.4			37.1	41.2	33.7		
6	St.Davids	44	38.5	37.9	45.2	39.8			36	25.0	25.7	36.8	28.1			38.3	41.0	39.0		
7	Swords	45	44.7	37.1	39.8	40.5			37	17.7	18.5	30.2	28.3			36.8	36.6	38.6		
8	Malahide	46	38.4	39.6	39.3	39.7			38	26.2	32.8	32.7	32.4			33.8	31.7	33.5		
10	St.Margarets NS	63	63.5	63.2	63.8	63.7			55	56.5	56.2	56.4	56.4			59.0	60.2	59.9		
20	Coast Rd (OP)	63	62.5	62.0	62.6	61.7			55	54.9	53.7	54.7	53.9			59.3	59.5	58.6		
26	Kilcoskan NS	58	59.1	59.5	61.2	61.0			40	35.8	33.1	38.3	34.5			60.3	61.7	61.6		
27	Summerhill	38	31.7	33.1	36.5	31.8			31	24.9	22.7	24.8	22.4			32.9	36.6	29.7		
28	Newpark	60	61.9	60.5	62.1	62.1			45	34.5	34.2	38.9	35.1			61.2	62.6	62.6		
29	Ashbourne	49	45.9	38.6	40.1	40.3			39	23.9	22.6	23.6	21.6			39.1	40.6	41.5		
30	Roundwood	36	12.8	15.1	19.0	20.8			28	0.0	0.0	0.0	0.0			16.4	20.6	22.4		
31	Dunboyne	54	50.5	49.8	50.9	50.7			47	43.0	43.9	45.4	45.3			41.1	39.3	36.2		
32	Donabate	45	0.0	33.4	28.2	35.1			37	0.0	11.8	12.4	26.5			32.6	27.8	31.6		
33	Ardgillan	33	26.5	30.6	30.6	30.4			24	19.3	17.9	21.2	23.1			29.0	27.5	26.5		
34	Portmarnock				55.4	54.5						47.4	46.7				52.8	51.6		
35	Ballyboughal				38.6	38.4						26.4	14.3				38.3	39.4		
206	Ratoath	47				48.0							27.9					48.7		

Total Noise versus Aircraft Noise Q1, Q2 and Q3 2024

NMT	Location	Lden Q1 2024			Lden Q2 2024			Lden Q3 2024		
		Total Noise (dBA)	Aircraft Noise (dBA)	# Aircraft Noise Events	Total Noise (dBA)	Aircraft Noise (dBA)	# Aircraft Noise Events	Total Noise (dBA)	Aircraft Noise (dBA)	# Aircraft Noise Events
1	Bay Lane	65.8	63.8	5340	65.2	63.6	5123	64.6	63.3	4703
2	St. Doolaghs	65.1	63.9	24974	65.4	64.6	31316	65.3	64.7	33442
3	Bishopswood	65.4	58.0	13843	63.9	58.8	18204	63.4	58.5	18407
4	Feltrim	62.6	51.8	3993	59.7	52.5	2880	60.4	52.4	4003
5	Balcultry	62.1	39.2	82	59.4	45.9	154	57.3	44.0	105
6	St.Davids	65.7	37.9	168	60.1	45.2	280	64.0	39.8	256
7	Swords	63.9	37.1	96	65.0	39.8	91	63.0	40.5	131
8	Malahide	61.8	39.6	259	60.0	39.3	507	59.8	39.7	285
10	St.Margarets NS	67.5	63.2	13977	66.8	63.8	19632	66.5	63.7	20643
20	Coast Rd (OP)	66.7	62.0	23324	65.6	62.6	29235	66.1	61.7	13530
26	Kilcoskan NS	63.5	59.5	14799	63.7	61.2	18948	62.8	61.0	21092
27	Summerhill	60.1	33.1	102	58.5	36.5	217	56.5	31.8	95
28	Newpark	66.0	60.5	15369	64.0	62.1	19287	63.4	62.1	20949
29	Ashbourne	60.4	38.6	695	59.1	40.1	934	54.6	40.3	870
30	Roundwood	60.4	15.1	2	57.7	19.0	1	56.4	20.8	6
31	Dunboyne	60.5	49.8	2214	59.6	50.9	2223	59.0	50.7	1917
32	Donabate	57.7	33.4	43	55.7	28.2	28	54.6	35.1	46
33	Ardgillan	57.7	30.6	28	54.3	30.6	33	53.9	30.4	29
34	Portmarnock							59.1	54.5	7131
35	Ballyboughal							60.9	38.4	277
206	Ratoath				58.6	48.0	5447	55.9	48.0	5975

- **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.

Q3 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	51.0	51.0	49.5	33.3	6.5	0.1	51.1	51.0	50.9	48.5	32.0	1.8	0.0	4703
2	St. Doolaghs	363.8	363.8	342.3	151.3	3.6	0.1	363.5	363.8	361.9	331.3	70.9	2.1		33442
3	Bishopswood	200.1	200.1	156.1	52.9	2.7	0.3	200.1	200.2	196.8	142.3	30.4	1.7	0.2	18407
4	Feltrim	43.5	34.4	12.7	5.4	1.2	0.3	43.5	43.3	28.8	12.4	4.1	1.1	0.2	4003
5	Balcultry	1.0	1.0	0.7	0.4	0.2		1.1	1.0	1.0	0.6	0.4	0.0		105
6	St.Davids	2.2	2.1	1.1	0.3	0.1	0.0	2.8	2.2	2.0	0.5	0.2	0.1		256
7	Swords	1.3	1.2	0.8	0.5	0.1		1.4	1.3	1.1	0.8	0.4	0.1		131
8	Malahide	1.5	0.6	0.1	0.0			3.1	1.6	0.4	0.2	0.1			285
10	St.Margarets NS	223.5	219.0	213.5	112.8	11.5	0.2	224.4	222.7	218.6	201.1	85.7	4.8		20643
20	Coast Rd (OP)	147.2	147.2	130.4	10.7	0.5	0.0	147.1	147.2	147.2	128.8	10.1	0.1	0.0	13530
26	Kilcoskan NS	229.2	226.5	212.4	119.0	10.4	0.1	229.3	228.8	226.1	212.5	114.1	9.5	0.0	21092
27	Summerhill	0.6	0.4	0.1				1.0	0.5	0.3	0.0	0.0			95
28	Newpark	227.6	227.0	202.6	152.4	19.5	0.8	227.7	227.6	217.7	199.7	152.7	14.8	0.3	20949
29	Ashbourne	9.4	8.3	2.1	0.2	0.0		9.5	9.3	6.4	1.6	0.4	0.1	0.0	870
30	Roundwood							0.0							0
31	Dunboyne	20.7	15.3	2.6	0.1	0.0		20.8	20.1	13.7	2.7	0.2			1917
32	Donabate	0.4	0.3	0.1	0.1	0.0		0.5	0.4	0.3	0.1	0.1	0.0		46
33	Ardgillan	0.2	0.2	0.1	0.0			0.3	0.2	0.1	0.0	0.0			29
34	Portmarnock	77.5	67.3	34.5	3.3	0.2	0.0	77.5	77.4	67.9	37.6	4.2	0.3	0.2	7131
35	Ballyboughal	2.8	2.8	2.8	0.5	0.0		3.0	2.8	2.8	1.7	0.2	0.0		277
206	Ratoath	64.9	47.7	7.3	0.9	0.1	0.0	64.9	62.9	47.3	7.8	0.9	0.1	0.0	5975

Including Permanent NMT installations only

Q3 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		3%	32%	52%	13%	0%	51.1	0%	5%	32%	59%	3.4%	0.0%	4703
2	St. Doolaghs	0%	6%	52%	41%	1%	0%	363.5	1%	8%	72%	19%	0.6%		33442
3	Bishopswood		22%	52%	25%	1%	0%	200.1	2%	27%	56%	14%	0.8%	0.1%	18407
4	Feltrim	21%	50%	17%	9%	2%	1%	43.5	33%	38%	19%	7%	2.0%	0.4%	4003
5	Balcultry	4%	33%	25%	22%	16%		1.1	6%	34%	20%	36%	3.1%		105
6	St.Davids	1%	47%	40%	8%	4%	1%	2.8	9%	66%	14%	7%	4.5%		256
7	Swords	5%	30%	28%	25%	11%		1.4	15%	26%	25%	28%	6.0%		131
8	Malahide	31%	14%	4%	1%			3.1	39%	8%	4%	2%			285
10	St.Margarets NS	2%	2%	45%	45%	5%	0%	224.4	2%	8%	51%	36%	2.1%		20643
20	Coast Rd (OP)		11%	81%	7%	0%	0%	147.1		12%	81%	7%	0.1%		13530
26	Kilcoskan NS	1%	6%	41%	47%	5%	0%	229.3	1%	6%	43%	46%	4.2%	0.0%	21092
27	Summerhill	31%	55%	15%				1.0	31%	51%	2%	2%			95
28	Newpark	0%	11%	22%	58%	8%	0%	227.7	4%	8%	21%	61%	6.3%	0.1%	20949
29	Ashbourne	12%	66%	20%	2%	0%		9.5	31%	51%	12%	4%	0.5%	0.1%	870
30	Roundwood							0.0							0
31	Dunboyne	26%	61%	12%	0%	0%		20.8	31%	53%	12%	1%			1917
32	Donabate	6%	56%	18%	18%	3%		0.5	24%	38%	18%	18%	2.9%		46
33	Ardgillan	22%	39%	33%	6%			0.3	33%	33%	17%	6%			29
34	Portmarnock	13%	42%	40%	4%	0%		77.5	12%	39%	43%	5%	0.2%	0.2%	7131
35	Ballyboughal			83%	16%	1%		3.0		38%	54%	7%	0.8%		277
206	Ratoath (March)	27%	62%	10%	1%	0%	0%	64.9	24%	61%	11%	1%	0%	0%	5975

Including Permanent NMT installations only



Part 2: Noise Monitoring Data Temporary NMT



Part 2: Portable Temporary NMT

- Mobile Noise Monitoring Terminals (NMT) are installed at locations around Dublin Airport based on requests from the two community forums – St. Margaret's Community Liaison Group and Dublin Airport Environmental Working Group.
- Locations can be seen on Page 7
- Data from the NMT at Milhead and Boroimhe are reported in the Q2 2024 Noise and Flight Track Monitoring Report.

#	Mobile NMT	From	Until	Quarterly Report
204	Milhead	Oct 2023	Jun 2024	Q2 2024
205	Boroimhe	Mar 2024	July 2024	Q2 2024
207	Kilcoscan	Jul 2024		Q3 2024 (this report)
208	Lusk	Aug 2024	Sept 2024	Q3 2024 (this report)

Portable Temporary NMT - #207 Kilcoscan and #208 Lusk

		Kilcoscan Aug 2024	Kilcoscan Sep 2024	Kilcoscan 2 Month Average		Lusk Aug 2024	Lusk Sept 2024	Lusk 2 Month Average
	Correlated Aircraft Noise Events	5259	3021			101	103	204
NMT Noise Levels	Total Lden (dBA)	60.7	58.5	59.7		61.7	61.8	61.8
	Aircraft Lden (dBA)	57.6	55.1	56.5		37.8	38.3	38.1
	Aircraft Lnight (dBA)	35.4	24.9	32.8		18.8	26.8	24.8
	Aircraft Leq16h (dBA)	57.8	55.4	56.8		38.0	38.0	38.0
Daily Number of Aircraft Noise Events Above Lmax values	NA Lmax 60	170	101			2.4	2.9	
	NA Lmax 65	170	101			1.2	1.7	
	NA Lmax 70	163	96			0.1	0.1	
	NA Lmax 75	45	18			0.0	0.0	
	NA Lmax 80	1.0	0.2			0.0	0.0	
	NA Lmax 85	0.0	0.0			0.0	0.0	
Daily Number of Aircraft Noise Events Above SEL values	NA SEL 65	170	101			2.6	2.8	
	NA SEL 70	170	101			2.6	2.7	
	NA SEL 75	169	100			2.4	2.3	
	NA SEL 80	142	83			1.0	1.4	
	NA SEL 85	22	12			0.0	0.0	
	NA SEL 90	0.2	0.0			0.0	0.0	
	NA SEL 95	0.0	0.0			0.0	0.0	



Part 3: Flight Track Monitoring



Page	Page Heading	Page Content
	Explanation of Terms	
	Standard Instrument Departures (SID) North Runway	<ul style="list-style-type: none">• AirNav Ireland maps displaying the departure SIDs from North Runway towards the West and the East.
	Standard Instrument Departures (SID) South Runway	<ul style="list-style-type: none">• AirNav Ireland maps displaying the departure SIDs from South Runway towards the West and the East.
	Busy day Flight Tracks - Westerly and Easterly Operations	Examples of a typical 'busy day' flight pattern
	Noise Contour Modelling (1) – Core Flight Tracks	Explanation of how noise contours are modelled using core flight tracks
	Noise Contour Modelling (2) – Dispersed Flight Tracks	Explanation of how noise contours are modelled using dispersed flight tracks
	Conclusion	

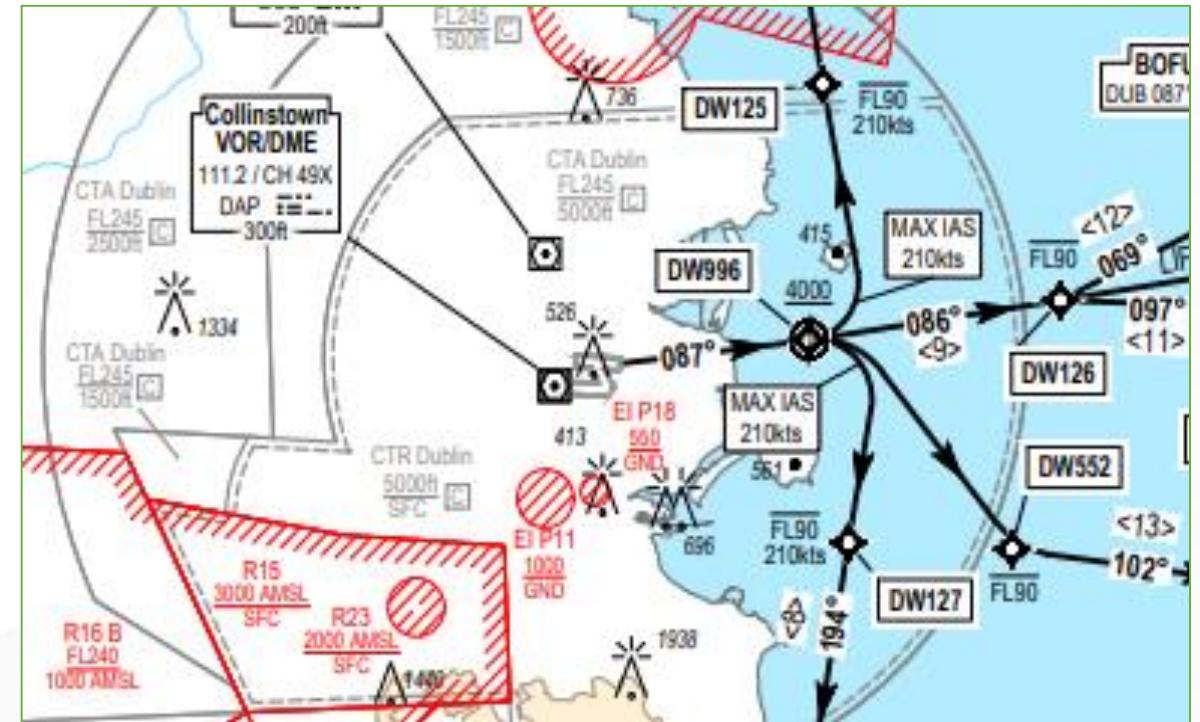
Term	Definition/ Explanation
Arrival Tracks	Arriving aircraft must fly in a straight line for at least the final 11km of their approach before landing on the runway. Aircraft approach the airport at a precise downward angle of 3 degrees, which means that they are at a height of 1,800ft when they join 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 these Standard Instrument Departures (SID).
- SID's are developed taking into account various safety, operational and environmental considerations amongst others.



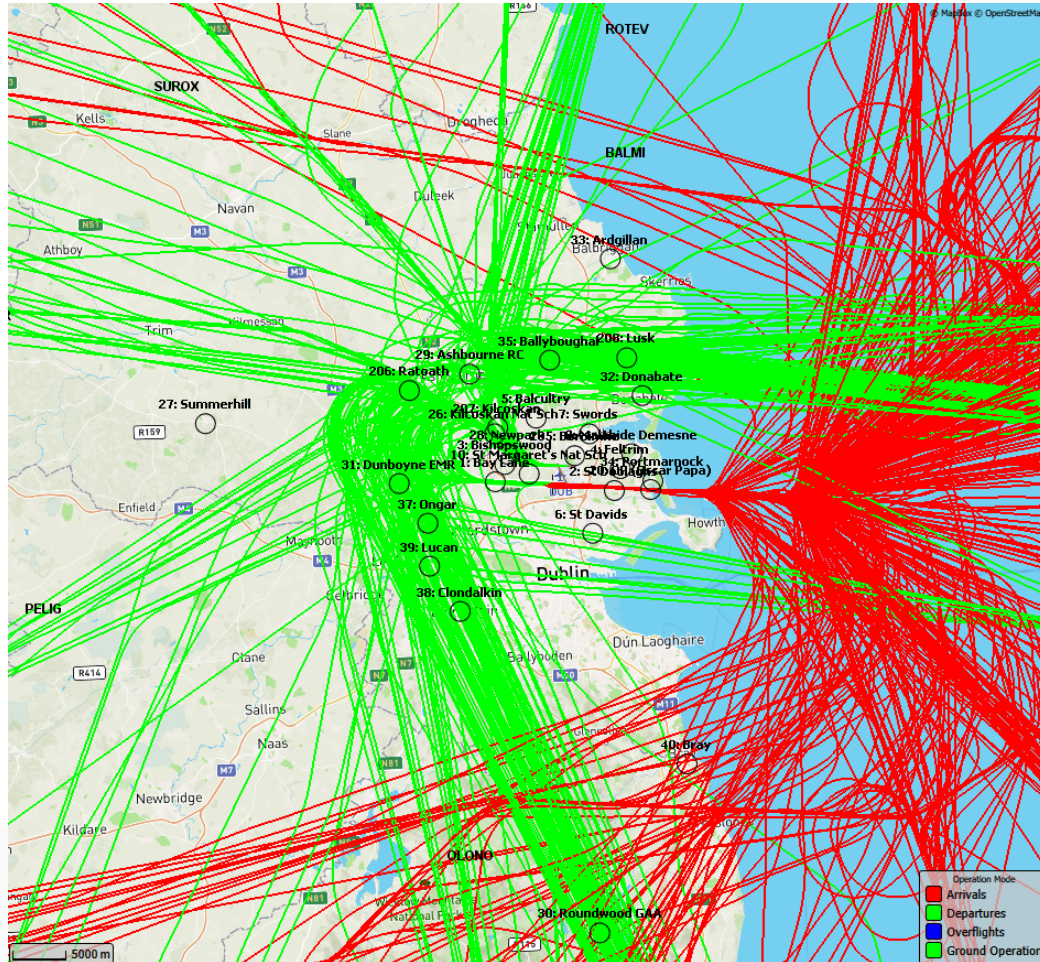
SID for North Runway (28R) departures to the west (westerly operations in westerly winds)



*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.*

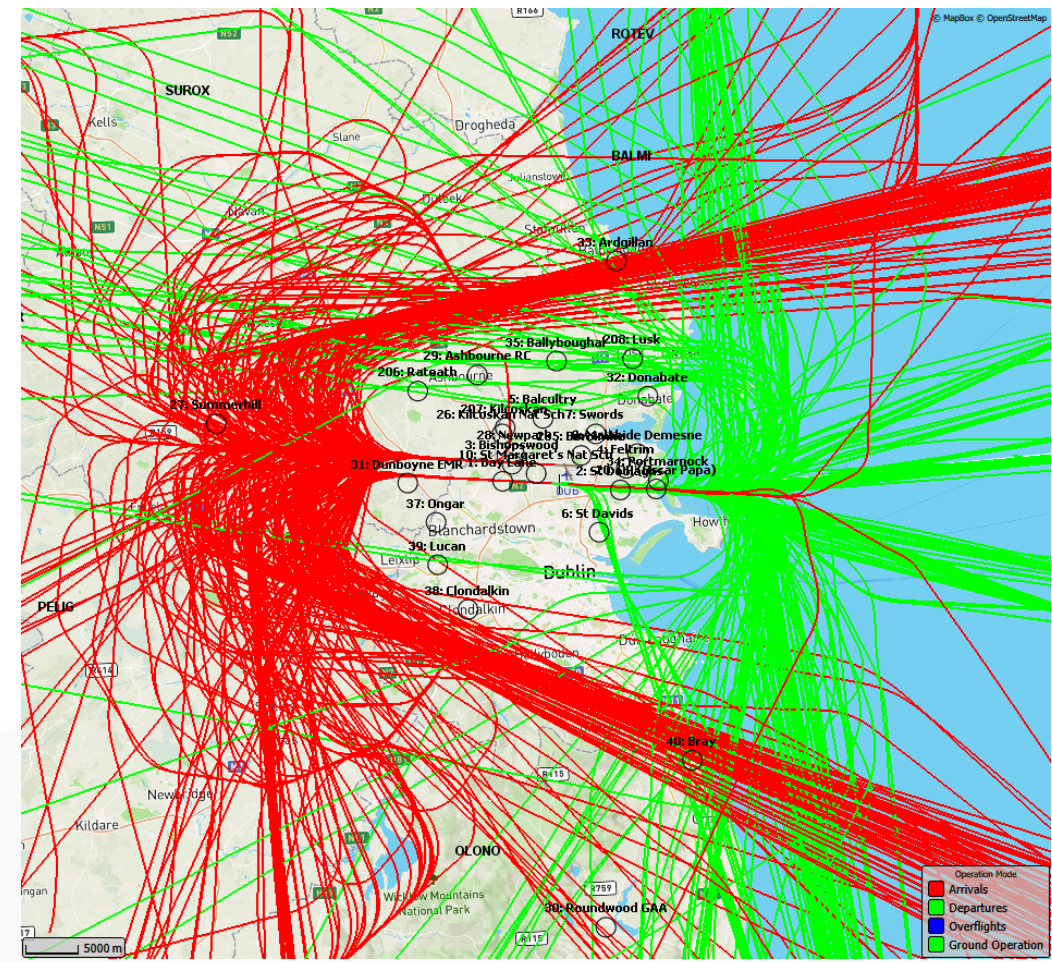
Busy Day Flight Tracks

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



Operations on 15 August 2024

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

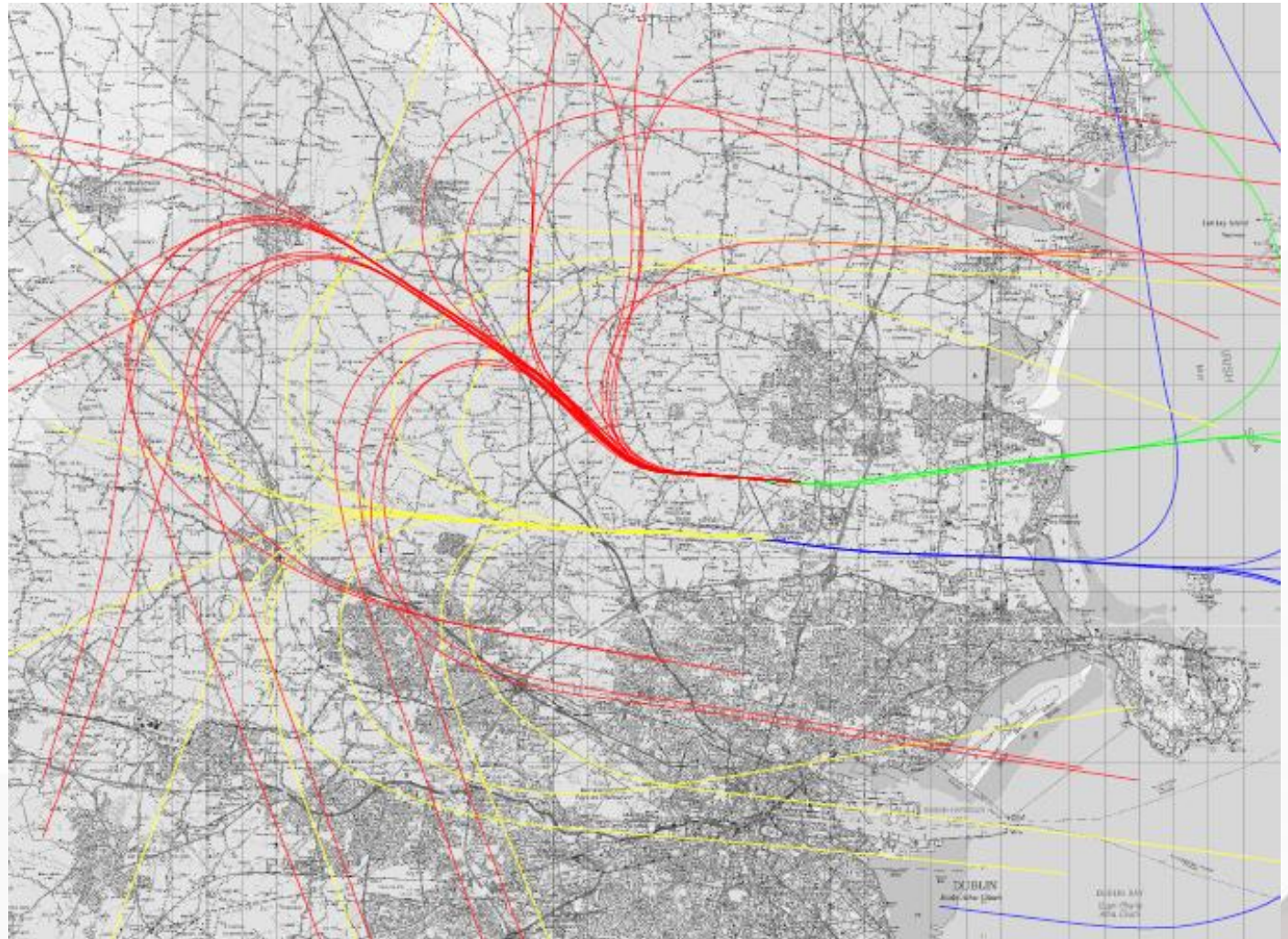


Operations on 1 September 2024

- 775 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:

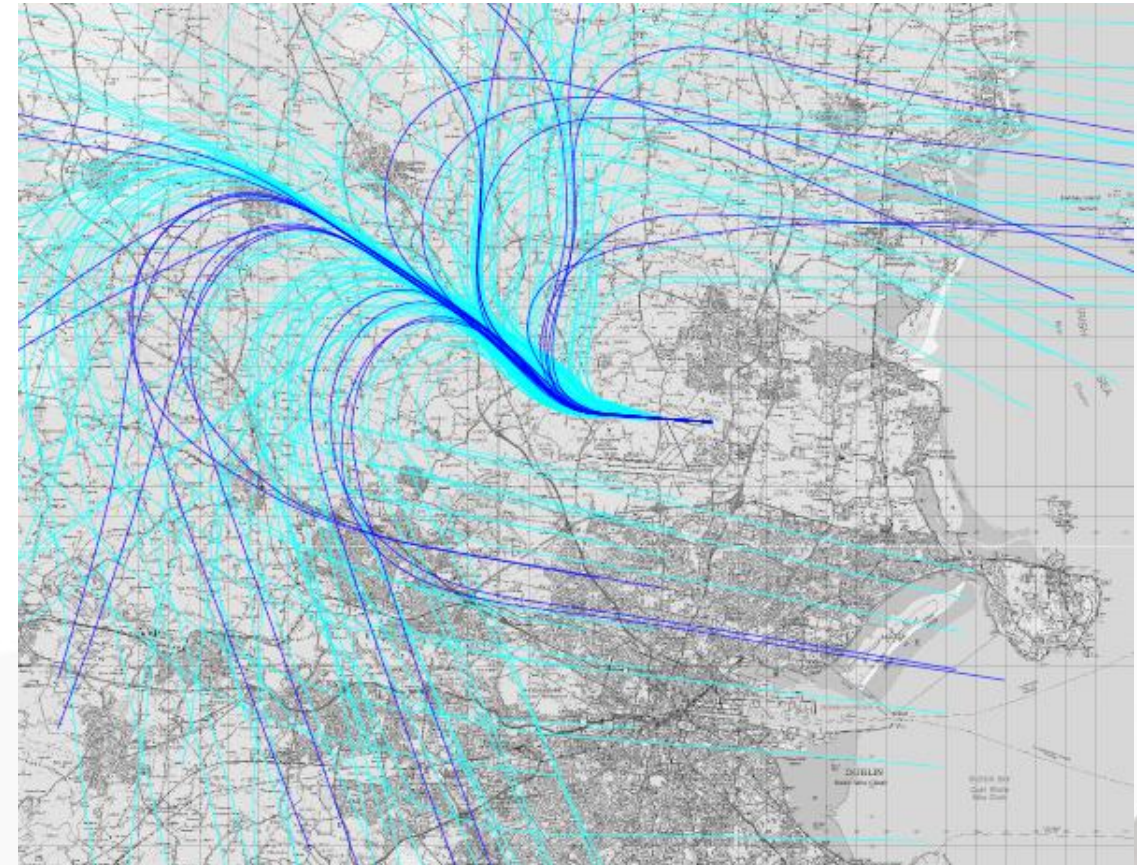
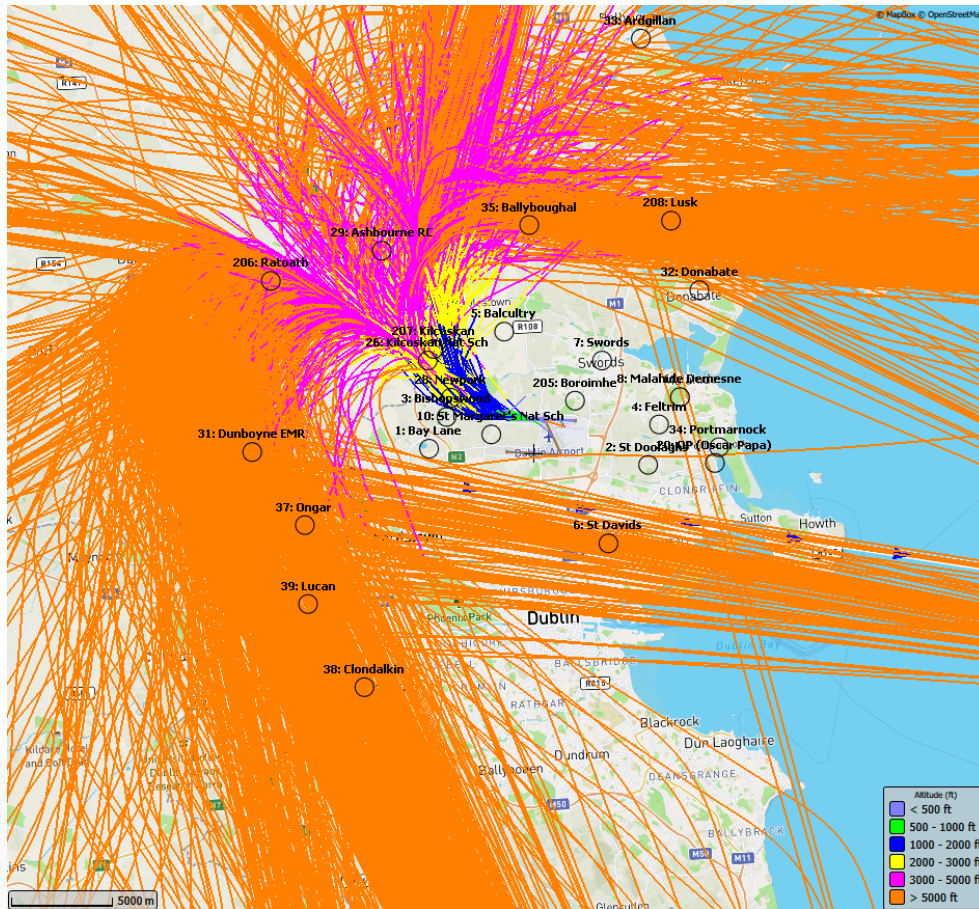
- Flight track data is extracted from the airport's Noise and Flight Track Monitoring system.
- Typical flight tracks are identified for each of the runways (as depicted here)
- Dispersed tracks are then created either side of the central lines to reflect actual operations (as depicted in the next page)



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 Tracks (with altitude):
North Runway (28R) – westerly departures
1-7 August 2024

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



Part 4: 92-day Summer Monitoring

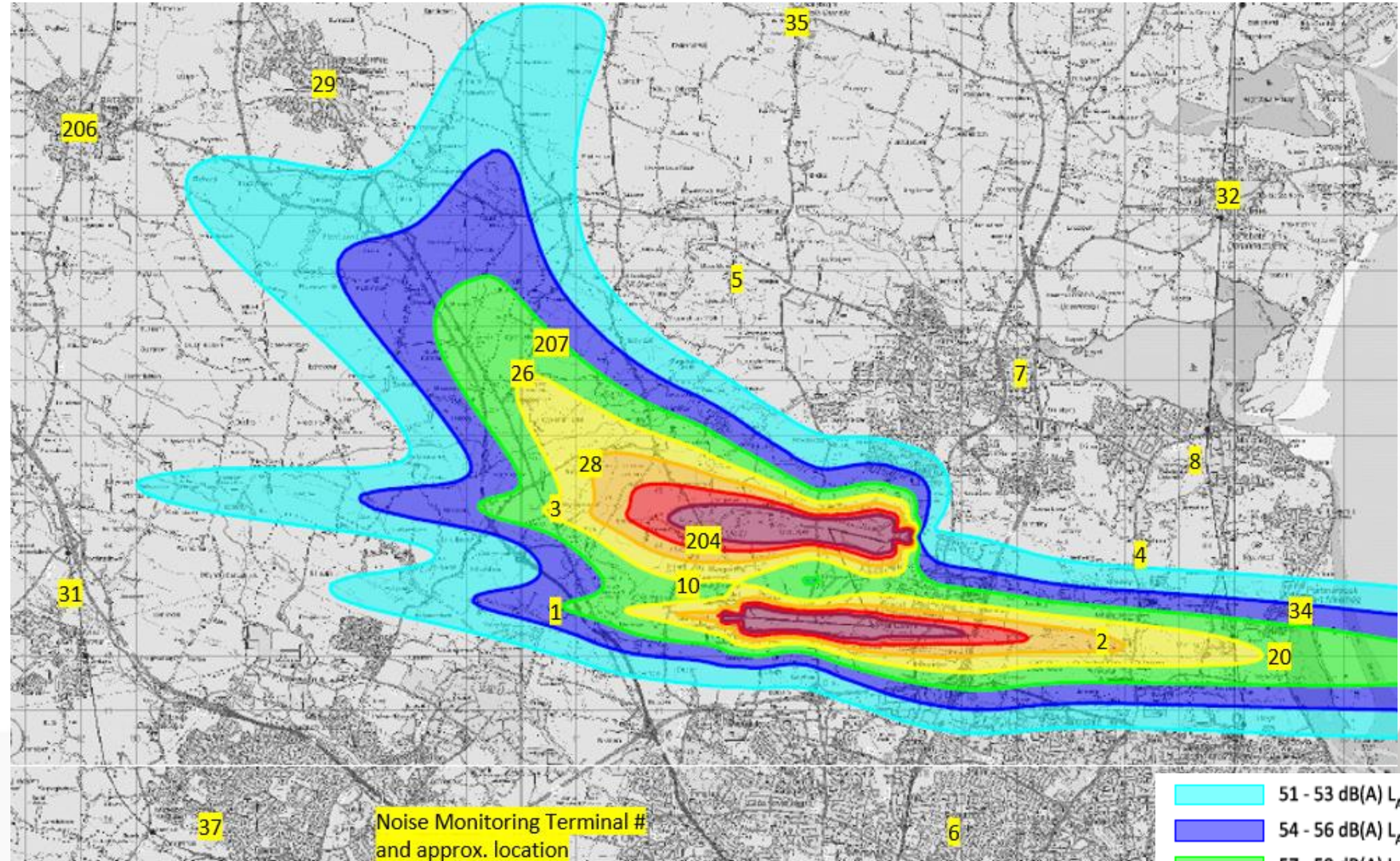


Why we have both Annual Lden and Lnight and Summer Leq16h and Leq8h noise contours.

- Before the EU agreed on the use of the Annual Lden and Lnight metrics in the early 2000's, Dublin Airport (and UK airports) mainly conducted noise impact assessment using the average noise levels over the 16-hour day (0700 – 2300) and the 8-hour night (2300 – 0700) assessed over the 92-day summer period - 16 June to 15 September. These are the Leq16h and Leq8h metrics, respectively.
- In 2004 when Dublin Airport applied for planning permission for the North Runway impact assessments were based on the Summer Leq16h and Leq8h metrics. The Leq16h daytime metric was also referred to as the “Daytime Annoyance” metric.
- The 2007 North Runway (NR) Planning Permission established the Noise Insulation Schemes (NIS) all based on the then-forecast summer Leq16h contours. These include the Residential Noise Insulation Scheme (RNIS), based on 63 dBA Leq16h, the Voluntary Dwelling Purchase Scheme (VDPS), based on 69 dBA Leq16h, and the School Insulation Scheme (SIS), based on 60 dBA Leq 16h. In 2024, the first NIS review was reported 2-years after the opening of the new North Runway and this review was based on the 2023 Summer Leq16h contour. (This was still during the 2024 summer period.)
- Since 2006, Dublin Airport has published Annual Lden and Lnight contours (every 5 years), and since 2018, four sets of contours have been published every year – Annual Lden and Lnight and Summer Leq16h and Leq8h.
- In 2020, Dublin Airport applied to modify the NR nighttime operating restriction (an application called the “Relevant Action”) and proposed the Residential Sound Insulation Grant Scheme (RSIGS). This Grant Scheme eligibility was based on the Annual 55 dBA Lnight contour.
- The 2021 Dublin Airport Noise Abatement Objective (NAO) uses assessments based on the Annual Lden and Lnight noise contours.
- As Dublin Airport reports the Summer Leq16h and Leq8h metrics and the NMT can measure them, the resulting data for the 2023 calculated summer contours and the 2023 and 2024 measured noise level are reported here.

92-day Summer Day – Modelled Contours and Measured NMT Levels

#	NMT Name	Leq 16h 2023 (Model)	Leq 16h 2023 (NMT)	Leq 16h 2024 (NMT)
1	Bay Lane	55.2	53.9	48.1
2	St. Doolaghs	61.7	61.2	61.2
3	Bishopswood	60.3	57.8	58.1
4	Feltrim	49.1	43.7	49.8
5	Balcultry	46.7	41.7	33.5
6	St.Davids	39.5	36.5	38.3
7	Swords	43.7	50.1	38.5
8	Malahide	42.9	32.2	34.4
10	St.Margarets NS	61.4	60.5	60.4
20	Coast Rd (OP)	59.6	59.7	59.5
26	Kilcoskan NS	59.9	61.4	62.0
27	Summerhill	33.1	35.0	29.0
28	Newpark	62.2	62.8	62.9
29	Ashbourne	48.7	31.7	41.8
30	Roundwood	34.1	17.6	22.4
31	Dunboyne	46.2	40.1	35.9
32	Donabate	42.3	0.0	31.7
33	Ardgillan	32.2		26.8
34	Portmarnock			51.0
35	Ballyboughal			39.2
206	Ratoath			49.1

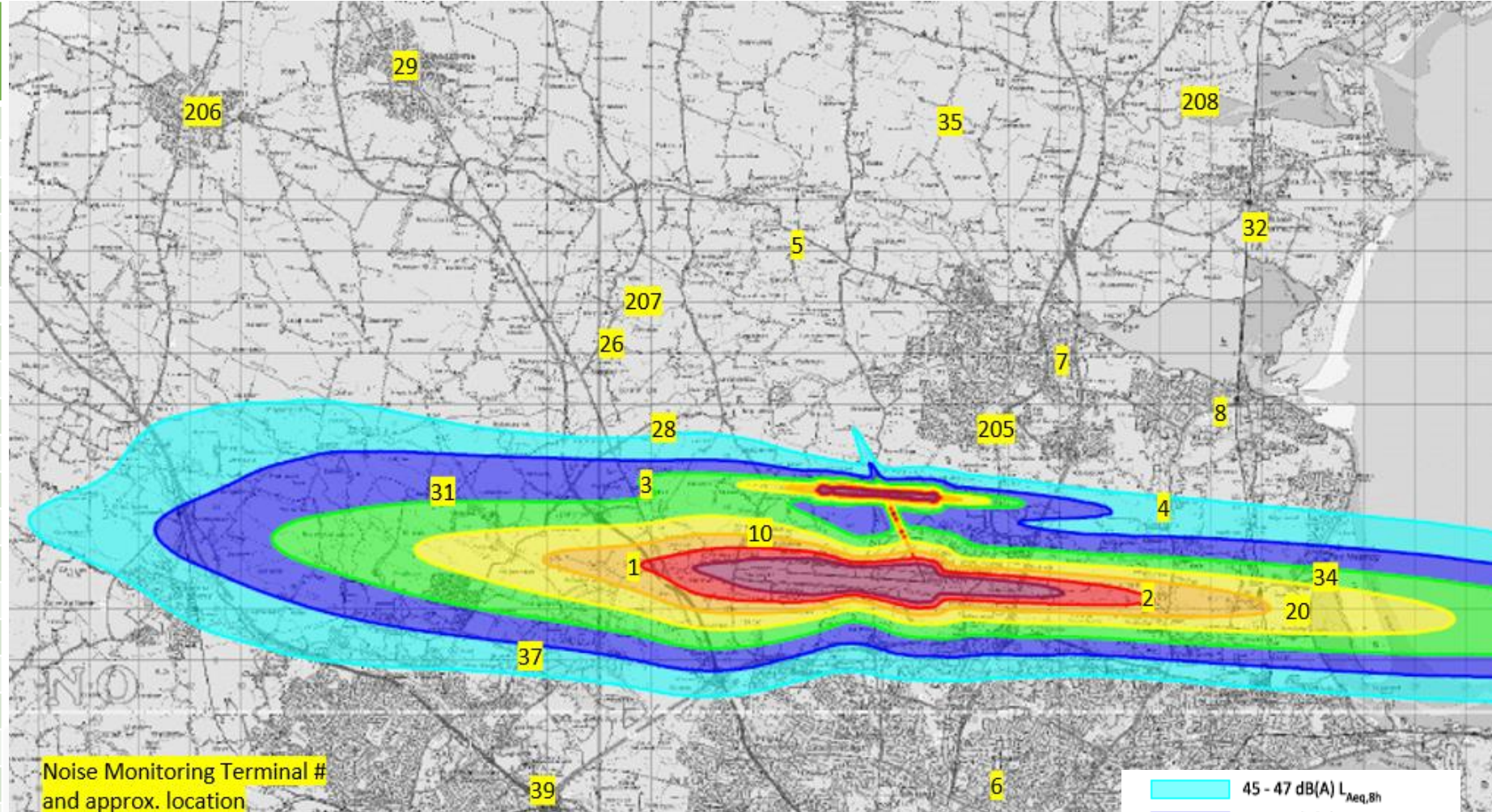


Map of 2023 Summer Leq16hr (day) noise contours

Including Permanent NMT installations

92-day Summer Night – Modelled Contours and Measured NMT Levels

#	NMT Name	Leq 8h 2023 (Model)	Leq 8h 2023 (NMT)	Leq 8h 2024 (NMT)
1	Bay Lane	58.3	57.8	57.4
2	St. Doolaghs	58.2	57.7	57.2
3	Bishopswood	50.9	46.4	43.8
4	Feltrim	46.8	43.6	46.6
5	Balcultry	39.8	27.0	38.4
6	St.Davids	36.3	18.4	25.9
7	Swords	36.8	39.5	28.6
8	Malahide	38.9	33.5	33.9
10	St.Margarets NS	55.9	55.9	56.8
20	Coast Rd (OP)	56.3	56.0	55.2
26	Kilcoskan NS	40.6	36.1	37.2
27	Summerhill	31.3	23.2	20.6
28	Newpark	45.1	38.8	38.1
29	Ashbourne	39.5	0.0	22.2
30	Roundwood	29.3	0.0	0.0
31	Dunboyne	46.8	45.9	44.3
32	Donabate	36.7	0.0	26.5
33	Ardgillan	23.7		23.2
34	Portmarnock			46.7
35	Ballyboughal			14.3
206	Ratoath			28.0



Map of 2023 Summer Leq8hr (night) noise contours

Including Permanent NMT installations

Noise Monitoring

- Dublin Airport had a network of 21 permanent and two mobile Noise Monitoring Terminals (NMT), for the entire Q3 period, at locations ranging from less than 1 km to over 30 km from the runways.
- Four new permanent NMTs were installed at Clondalkin, Lucan, Bray and Ongar in August.
- 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.
- Monthly data is provided for the two mobile NMT at Kilcoscan and Lusk, in place for three and two months, respectively.

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 in the Noise Contours accurately represent community noise exposure levels.
- This mean 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