



Dublin Airport Supplementary Data to Noise Monitoring Report for July – Dec 2023

- Noise Monitoring Terminal and Noise Contour Data

Overview

- This 'Supplementary Report' should be read in conjunction with the 'Noise Monitoring Report July – December 2023'
- This supplement provides additional noise data and information relating to noise contours
- We have provided an explanation of the content of each page in this document below.

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7.	2023 Lden Annual Noise Contours and Lden NMT Data	<ul style="list-style-type: none"> • Map of 2023 Noise Contours based on the Lden metric • Approximate NMT locations • Corresponding modelled (calculated) Lden noise levels (2022 and 2023) at each NMT location
8.	2021 and 2022 Quarterly and Annual NMT data (Lden) and Correlated Aircraft Events	<ul style="list-style-type: none"> • Quarterly and annual NMT data showing measured Aircraft Noise (Lden) at each NMT • Number of correlated aircraft noise events identified at each NMT.
9.	2023 Quarterly and Annual NMT data (Lden) and Correlated Aircraft Events	<ul style="list-style-type: none"> • Quarterly and annual NMT data showing measured Aircraft Noise (Lden) at each NMT • Number of correlated aircraft noise events identified at each NMT.
10.	2021 – 2023 Annual Noise Data and Correlated Aircraft Events	<ul style="list-style-type: none"> • Annual NMT data showing measured Aircraft Noise (Lden) - 2021, 2022 and 2023 • Annual Night Noise Data and Correlated Aircraft Events – 2023 • Leq16 and Leq8 Noise Data – 2023 • Modelled Contour Noise Data - Lden (2021 and 2022); Night (2023); Leq16 and Leq8 (2023)

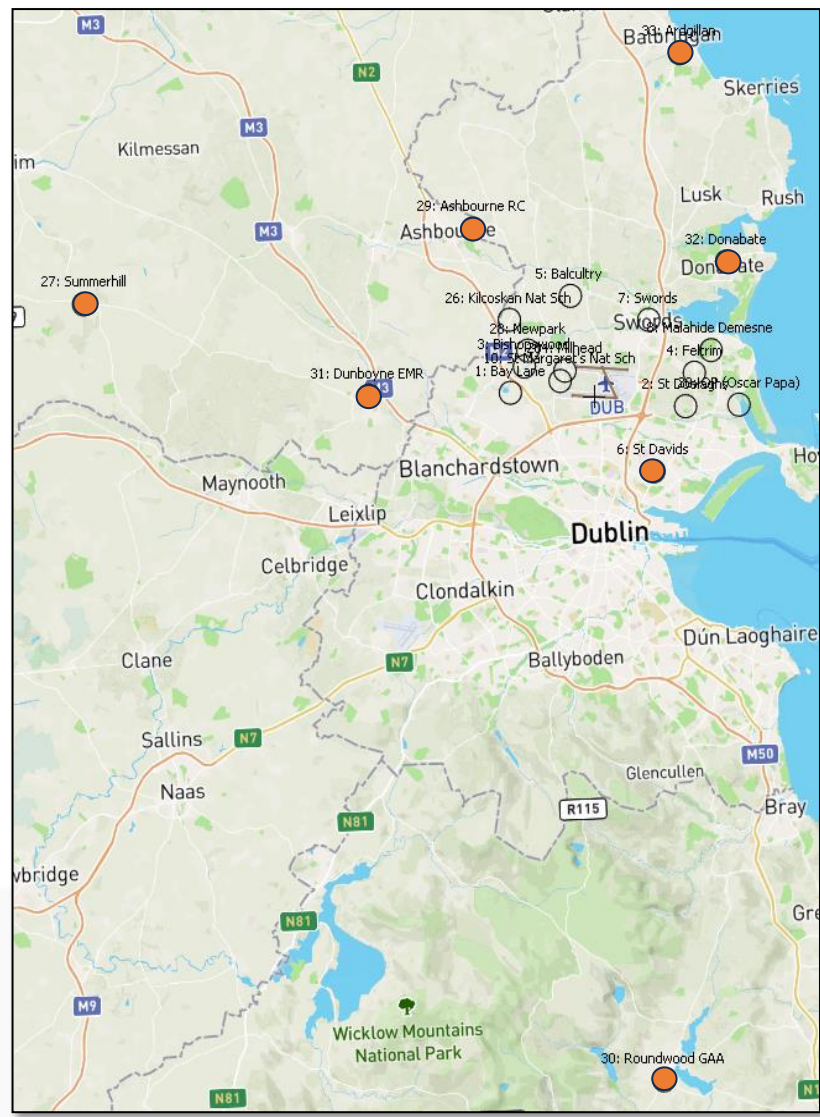
Explanation of Terms

This report contains various terms relating to noise analysis and metrics. The below table outlines an explanation of terms used.

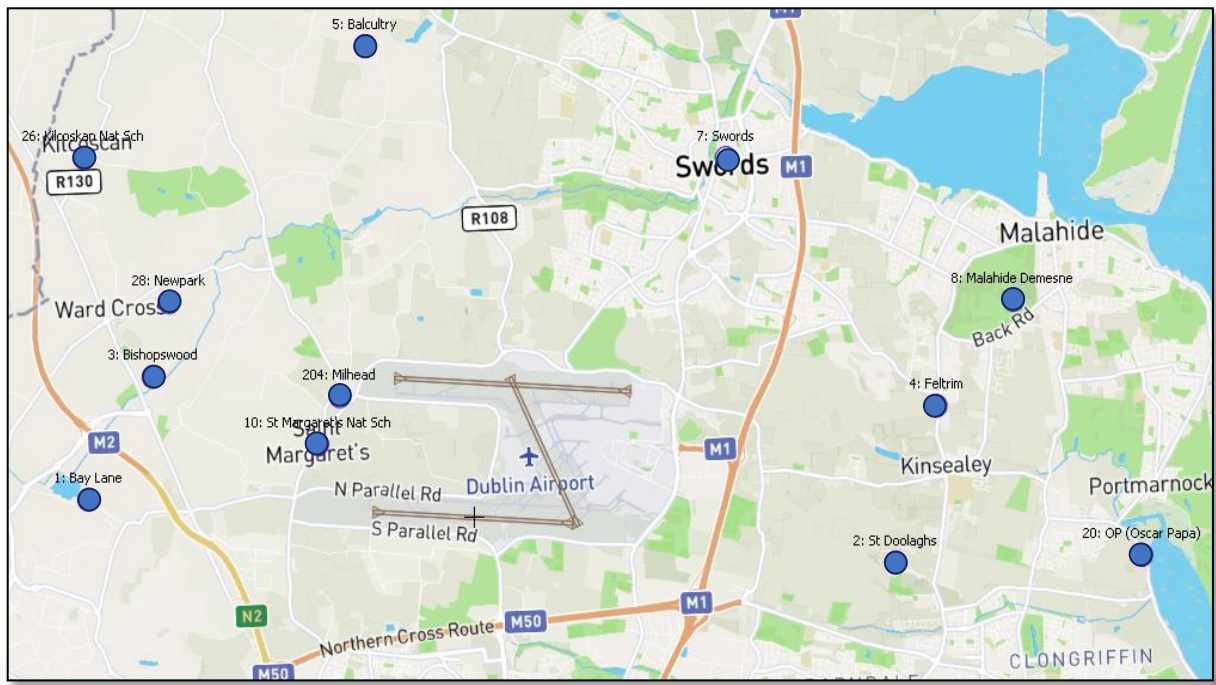
Term	Definition
NMT	NMT means Noise Monitoring Terminal. They are generally located in community areas. An NMT includes a high-quality, calibrated microphone and provides continuous noise level data at the location of the NMT.
Noise Event	A noise event is detected at an NMT location when the noise level 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.
(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 (eg Lden, Lnight, Leq16) at the NMT location.
Measured noise levels	This is the assessment of the noise level at an NMT derived from data from the NMT. Every measured noise level is only at the NMT point location.
Modelled noise levels	This is calculated using a 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. The Modelled noise level can also be calculated at each NMT location.
Noise Contours	Contours are lines that join points of the same modelled noise level covering a study area. All noise contours are modelled.
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 is far from the NMT. Modelled data includes all aircraft activity in the 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 provides good information on actual noise levels at vast majority of locations that do not have an NMT.
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, with a penalty of 10 dB(A) for night-time noise (23.00-7.00) and an additional penalty of 5 dB(A) for evening noise (i.e. 19.00-23.00).
Lnight	Lnight is the night-time (11pm- 7am) annual average noise indicator
Leq16	Leq is the Equivalent Continuous Sound Level and is the average sound level, which over a given period of time has the same total energy as the fluctuating noise. Leq16 covers the 16-hour period (7am – 11pm) every day over 92 days during the airport's summer months.
Leq8	Leq8 covers the 8-hour period (11pm – 7am) every night over 92 days during the airport's summer months.

Locations of Noise Monitoring Terminals

#	NMT Name	Installed
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	OP	2021
26	Kilcoskan NS	Q4 2022
27	Summerhill	Q3 2023
28	Newpark	Q3 2023
29	Ashbourne RC	Q3 2023
30	Roundwood GAA	Q4 2023
31	Dunboyne EMR	Q3 2023
32	Donabate	Q4 2023
33	Ardgillan	Q4 2023
204	Milhead	Q3 2023



Orange circle = NMT's located further out from Dublin Airport

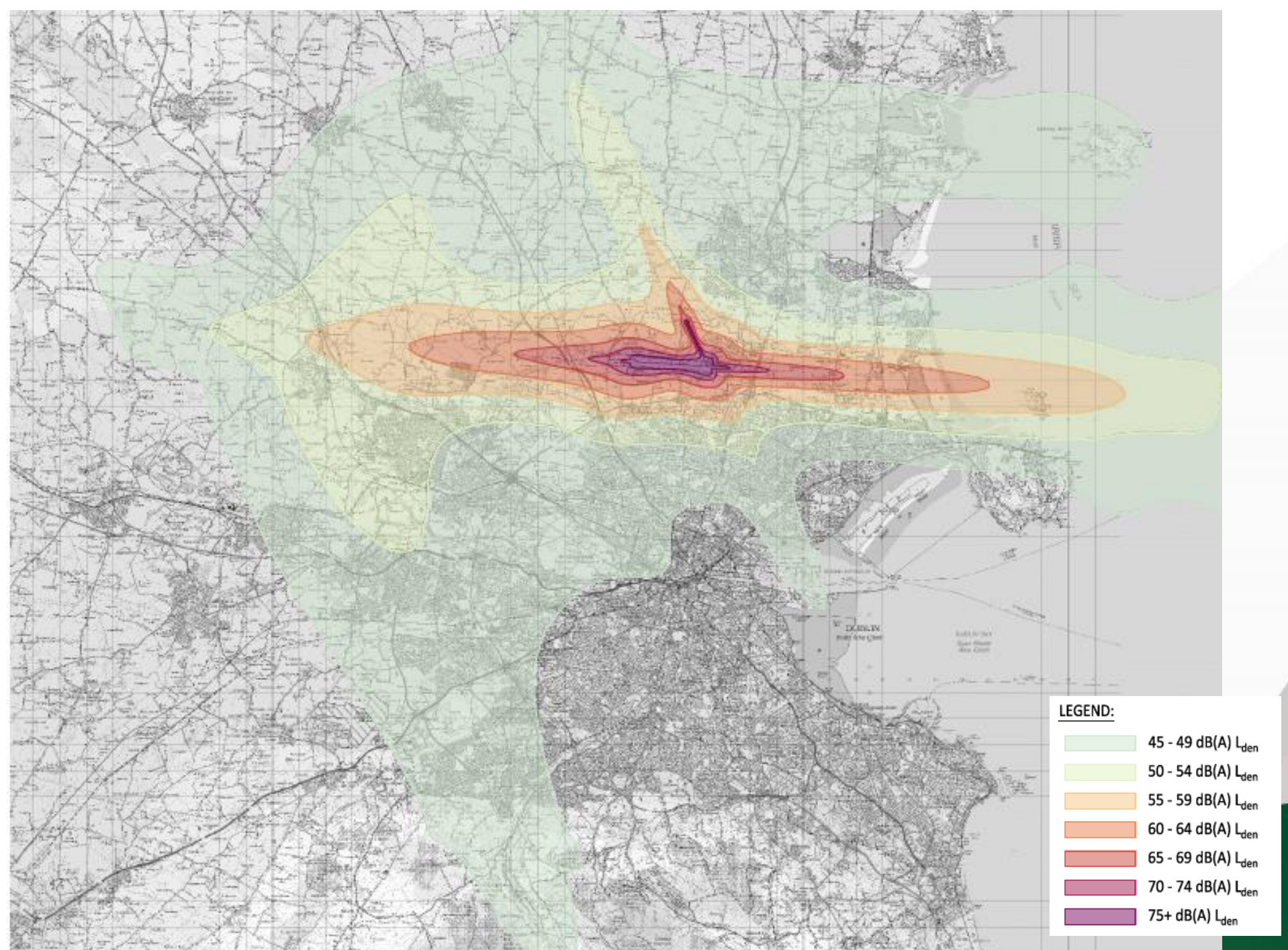


Blue circle = NMT's located in closer proximity to Dublin Airport

*All NMT locations are as at December 2023

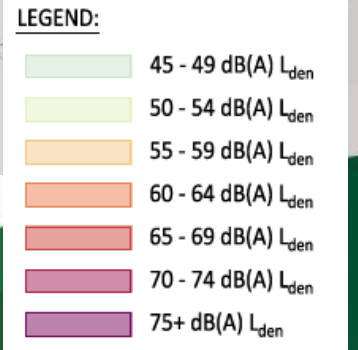
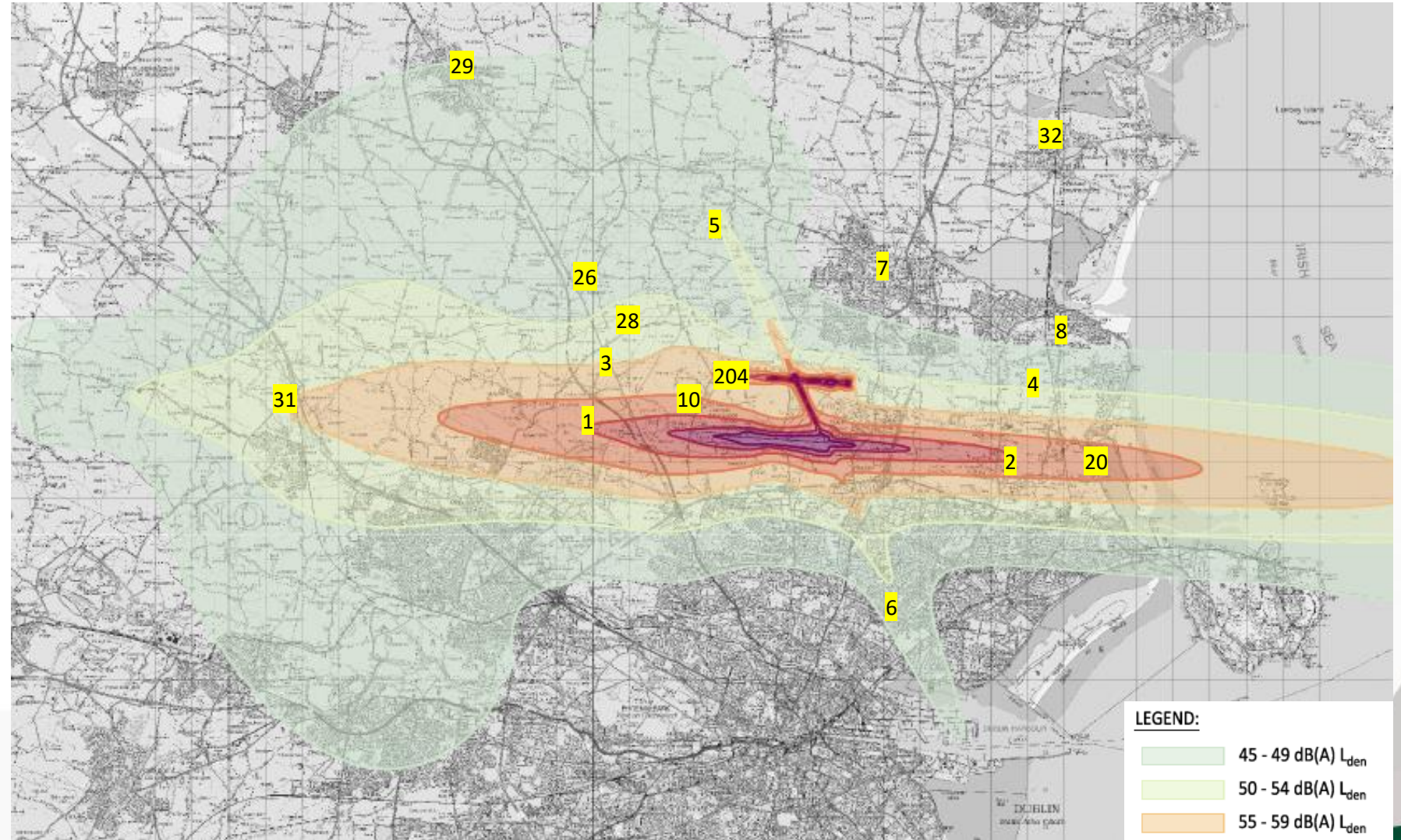
2019 Lden Annual Noise Contours

- Lden = Day-evening-night level. It is a descriptor of noise level based on energy equivalent noise level (L_{eq}) over a whole day with a penalty of 10 dB(A) for night-time noise (23.00-7.00) and an additional penalty of 5 dB(A) for evening noise (i.e. 19.00-23.00).
- The EU uses Lden for assessing the impact of transport systems – airports, road and rail – and for measuring longer term improvements and goals.
- The map shows Lden noise ranges from 45dB right through to 75dB+
- Areas closest to the airport will have the highest Lden levels and as you move away from the airport, the Lden levels will reduce, primarily due to the altitude and scatter of aircraft.
- Noise contours are calculated on flight track data and aircraft movements (with some calibration reference to the NMT data).



2022 Lden Annual Noise Contours and Lden NMT Data

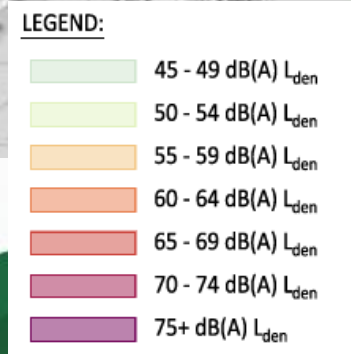
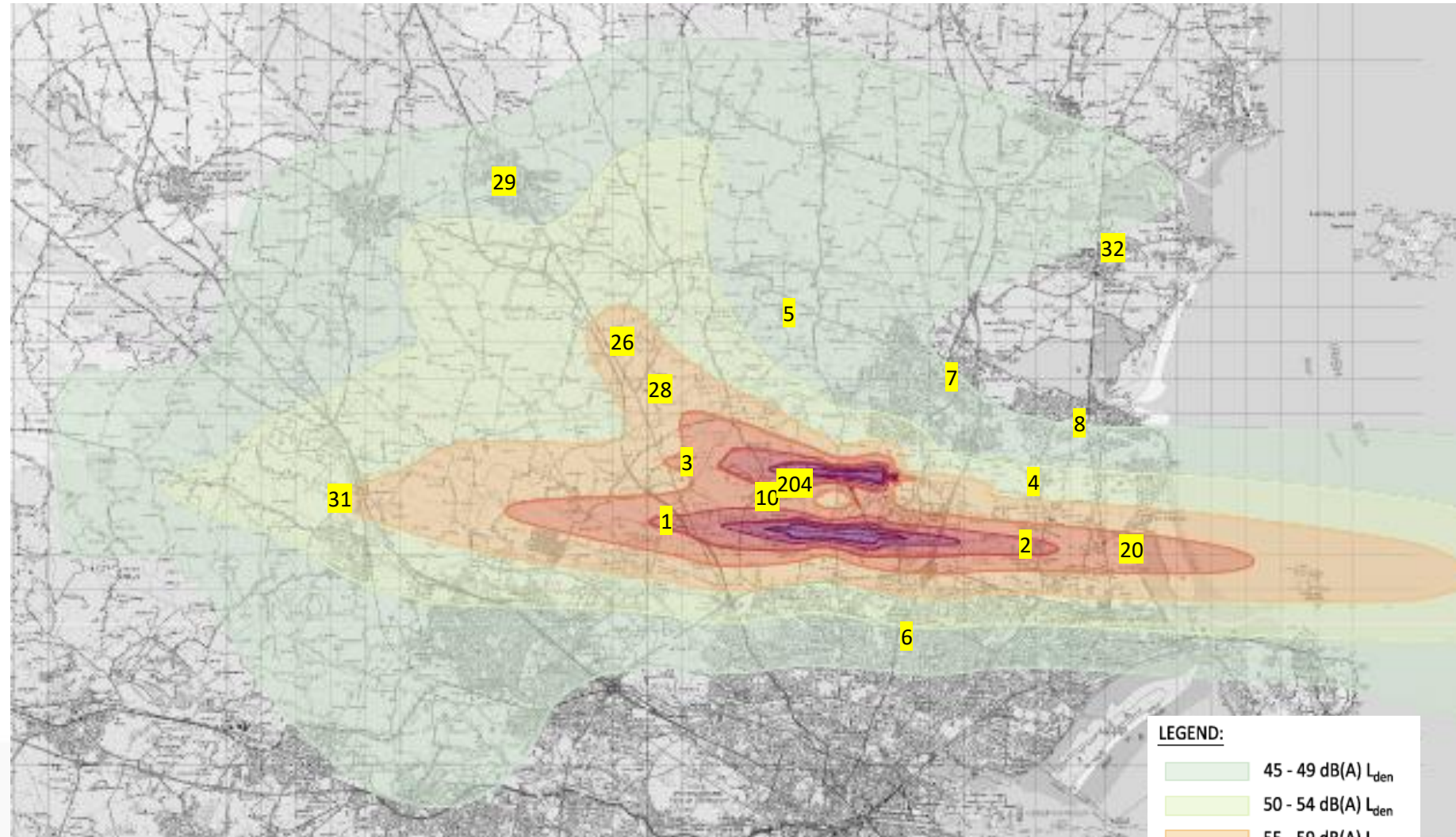
#	NMT Name	Lden 2022
1	Bay Lane	66
2	St Doolaghs	64
3	Bishopswood	56
4	Feltrim	50
5	Balcultry	51
6	St Davids	48
7	Swords	<45
8	Malahide	45
10	St.Margarets Nat Sch	63
20	OP	62
26	Kilcoskan Nat Sch	49
27	Summerhill	<<45
28	Newpark	54
29	Ashbourne RC	46
30	Roundwood GAA	<<45
31	Dunboyne EMR	55
32	Donabate	<45
33	Ardgillan	<<45
204	Milhead	61



- ■ = Noise Monitoring Terminal location number and approximate location
- Three NMT's are located outside of this map's boundaries (no. 27,30 and 33, see Page 4)
- The table on the left shows Lden noise levels modelled at each NMT (refer to the colour legend)
- The symbol < indicates that noise levels are below 45dBA and << means they are well below 45dBA.

2023 Lden Annual Noise Contours and Lden NMT Data

#	NMT Name	Lden 2022	Lden 2023
1	Bay Lane	66	65
2	St Doolaghs	64	65
3	Bishopswood	56	60
4	Feltrim	50	54
5	Balcultry	51	49
6	St Davids	48	44
7	Swords	<45	45
8	Malahide	45	46
10	St.Margarets Nat Sch	63	63
20	OP	62	63
26	Kilcoskan Nat Sch	49	58
27	Summerhill	<<45	38
28	Newpark	54	60
29	Ashbourne RC	46	49
30	Roundwood GAA	<<45	36
31	Dunboyne EMR	55	54
32	Donabate	<45	45
33	Ardgillan	<<45	33
204	Milhead	61	67



- = Noise Monitoring Terminal number and approximate location
- Three NMT's are located outside of this map's boundaries (no. 27,30 and 33)
- The table on the left shows Lden noise levels modelled (ie calculated) at each NMT ('22 and '23)
- The symbol < indicates that noise levels are below 45dBA
- << means that noise levels are well below 45dBA

Quarterly and Annual NMT Data and Correlated Aircraft Events (2021 & 2022)

- The data table below displays the following information:
 - Lden measured aircraft noise at each NMT location per quarter and annually across 2021 and 2022
 - Number of correlated aircraft noise events
 - Note:** "NR Opens" indicates when the North Runway opened (Q4 2022).

		2021										2022									
		Q1		Q2		Q3		Q4		2021 Year		Q1		Q2		Q3		(NR opens) Q4		2022 Year	
LOC ID	Location	Lden	Events	Lden	Events	Lden	Events	Lden	Events	Lden	Events	Lden	Events	Lden	Events	Lden	Events	Lden	Events	Lden	Events
1	Bay Lane	59.3	4039	59.9	5199	63.3	14797	63.5	17611	61.9	41646	63.5	16781	65.5	26789	65.1	25544	64.6	17380	64.7	86494
2	St. Doolaghs	58.6	4458	58.5	5615	61.6	15161	62.7	18310	60.8	43544	62.8	17397	64.4	28158	64.8	29956	64.2	26009	64.1	101520
3	Bishopswood	49.3	1543	49.3	1447	52.4	4050	54.0	6526	51.7	13566	55.3	6235	53.8	7095	52.7	5720	55.2	9165	54.4	28215
4	Feltrim	41.9	498	38.5	400	38.2	598	44.8	1144	41.7	2640	50.1	2818	46.4	2821	41.9	1503	48.8	2821	47.7	9963
5	Balcultry	46.4	145	41.3	114	47.4	219	47.3	224	46.2	702	50.6	413	50.7	315	55.5	308	63.3	2107	58.3	3143
6	St.Davids	40.7	104	43.1	117	42.7	81	46.9	151	44.0	453	44.8	284	40.8	124	43.3	174	44.7	397	43.7	979
7	Swords													28.1	8	39.5	154	44.9	109	41.3	271
8	Malahide													38.2	12	32.3	212	34.3	197	35.7	421
10	St.Margarets Nat Sch															63.5	16871	64.0	18840	63.8	35711
20	OP	56.4	3658	56.5	5004	59.6	14215	60.8	17358	58.7	40235	60.8	16244	62.3	25981	63.0	27985	62.4	18603	62.2	88813
26	Kilcoskan Nat Sch																	51.5	2938	51.5	2938

Quarterly and Annual NMT Data and Correlated Aircraft Events (2023)

- The data table below displays the following information:
 - Lden measured aircraft noise at each NMT location each quarter across 2023 (including all new NMT's installed in 2023)
 - Number of correlated aircraft noise events
 - Note:** The published '*Noise Monitoring Report June – December 2023*' (page 3), displays Aircraft Noise Events from movements on the relevant runway. The figures included in the table below shows **all** detected Aircraft Noise Events across all Dublin Airport runways.

		2023							
		Q1		Q2		Q3		Q4	
LOC ID	Location	Lden	Events	Lden	Events	Lden	Events	Lden	Events
1	Bay Lane	63.6	11311	66.1	13883	63.3	5685	63.6	4769
2	St. Doolaghs	64.2	24852	64.3	29563	65.3	33166	64.3	22706
3	Bishopswood	55.5	10200	57.3	14562	58.6	17047	58.2	15473
4	Feltrim	50.9	2746	51.1	4330	50.3	2268	52.1	3699
5	Balcultry	51.7	1878	43.8	103	39.9	123	38.7	87
6	St.Davids	39.4	106	38.0	267	38.0	156	36.9	119
7	Swords	39.8	132	47.5	107	46.6	125	38.8	121
8	Malahide	38.7	265	38.3	525	39.3	299	36.6	260
10	St.Margarets Nat Sch	63.7	17653	62.2	13981	63.9	22065	63.7	18270
20	OP	63.0	16677	60.7	14067	63.6	30963	62.5	25153
26	Kilcoskan Nat Sch	55.9	8124	56.5	7383	61.3	22235	60.2	17000
27	Summerhill					28.6	34	31.7	85
28	Newpark					60.6	13011	61.4	19089
29	Ashbourne RC					35.0	218	46.9	905
30	Roundwood GAA							12.3	1
31	Dunboyne EMR					(49.4)	(974)	50.7	1852
32	Donabate							0	0
33	Ardgillan							25.1	3
204	Milhead					62.5	1428	66.5	22853

Measured and Modelled Annual Noise Data and Correlated Aircraft Events (2021 - 2023)

- The data table below displays the following information:
 - Measured 2021 and 2022 Annual Lden Noise Data at each NMT and Correlated Aircraft Events – same data as appears on page eight of this document
 - Modelled 2022 Lden levels at each NMT - same data as appears on page six of this document
 - Measured 2023 Annual Lden Noise Data and Correlated Aircraft Events
 - Measured 2023 Annual Lnight Noise Data and Correlated Aircraft Events during the defined Lnight period
 - Modelled 2023 Lden and Lnight at each NMT location - same data as appears on page seven of this document
 - Measured 2023 Summer Leq16 and Leq8 Noise Data at each NMT
 - Modelled 2023 Summer Contour (Leq16 and Leq8) at each NMT
- Overall, the data statistics presented below shows a good correlation between the measured NMT data and the modelled Lden noise contours. For example, at Ashbourne (NMT 29), the 2022 modelled contour indicated an Lden level of 46dBA and the 2023 measured level based on 1,123 aircraft noise events over the course of five months, displays a measured level of 45.9dBA

Annual NMT and Lden Contour		2021		2022			Modelled	2023 - Measured					Modelled		Measured		Modelled	
		From Q Reports		2022 NMT			2022 Contour	ANNUAL 2023 NMT					2023 Contour		approx SUMMER		2023 Sumer Contour	
LOC ID	Location	Lden	Events	Lden	Events		Lden	2023	Lden	Events	Lnight	Evnt (N)	Lden	Lnight	Leq16	Leq8	Leq16	Leq8
1	Bay Lane	61.9	41646	1yr	64.7	86494	66	1yr	64	35,542	57	14,229	65	58	55	58	55	58
2	St. Doolaghs	60.8	43544	1yr	64.1	101520	64	1yr	65	109,927	57	15,958	65	57	61	58	62	58
3	Bishopswood	51.7	13566	1yr	54.4	28215	56	1yr	58	58,564	46	2,849	60	49	58	46	60	51
4	Feltrim	41.7	2640	1yr	47.7	9963	50	1yr	51	13,161	44	1,784	54	46	44	43	49	47
5	Balcultry	46.2	702	1yr	58.3	3143	51	1yr	47	2,217	19	48	49	39	42	25	47	40
6	St.Davids	44.0	453	1yr	43.7	979	48	1yr	39	670	25	37	44	36	38	19	39	36
7	Swords			9m	41.3	271	<45	1yr	45	506	18	50	45	37	47	38	44	37
8	Malahide			9m	35.7	421	45	1yr	38	1,405	26	621	46	38	31	32	43	39
10	St.Margarets Nat Sch			6m	63.8	35711	~63	1yr	63	73,312	56	13,640	63	55	60	56	61	56
20	OP	58.7	40235	1yr	62.2	46588	62	1yr	63	86,372	55	12,966	63	55	60	56	60	56
26	Kilcoskan Nat Sch			3m	51.5	2938	49	1yr	59	54,742	36	306	58	40	61	36	60	41
27	Summerhill			-	-	-	10km Wof45Lden	5m	32	106	25	42	38	31	-	-	33	31
28	Newpark			-	-	-	54	5m	62	33,006	35	281	60	45	-	-	62	45
29	Ashbourne RC			-	-	-	46	5m	46	1,123	24	7	49	39	-	-	49	40
30	Roundwood GAA			-	-	-	36km Sof45Lden	3m	13	1	0	0	36	28	-	-	34	29
31	Dunboyne EMR			-	-	-	55	4m	50	2,353	43	1,991	54	47	-	-	46	47
32	Donabate			-	-	-	5km Nof45Lden	5m	0	0	0	0	45	37	-	-	42	37
33	Ardgillan			-	-	-	17km Nof45Lden	1m	26	6	19	3	33	24	-	-	32	24
204	Milhead			-	-	-	~61	6m	65	24,281			67	51	-	-	69	52