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Aircraft Noise Monitoring

Noise Monitoring - Introduction

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At larger airports it is now common practice to monitor the airborne aircraft noise.

This is undertaken by sets of permanent monitors linked to a central hub, often supported by a mobile monitor(s).

The systems vary in size and complexity, from just two permanent monitors, to many.

Becoming more common for the monitoring to be combined with track keeping.

Monitors themselves comprise:

- a microphone protected by a wind shield and bird spikes

linked to

- a sound level meter in a weather proof box

Noise Monitoring Specifics

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Monitor Locations

Standard location is 6.5 km SOR

(Start of Roll)

This is one of the positions used when aircraft are certificated.

For the main runway at Dublin this is locations approximately 3.9 km from the ends of the runway.

Monitor Siting

Ideally free from:

- local screening
- local reflections
- other sources of noise

Require:

- Mains Power
- Telecommunications

Dublin Monitor Locations

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At approx. 6.5 km from SOR

(NMT1) Bay Lane, West of Main Runway

(NMT2) St. Doolaghs, East of Main Runway

(NMT3) Bishopswood, West of North Runway

(NMT4) Feltrim, East of North Runway

(NMT5) Balcultry, North-west of Cross Runway

(NMT6) Artane, South-east of Cross Runway

Additional

(NMT20) Coast Road, Further East of Main Runway

(NMT21) & (NMT22) Monitoring noise produced by aircraft on the ground at a location close to the airport

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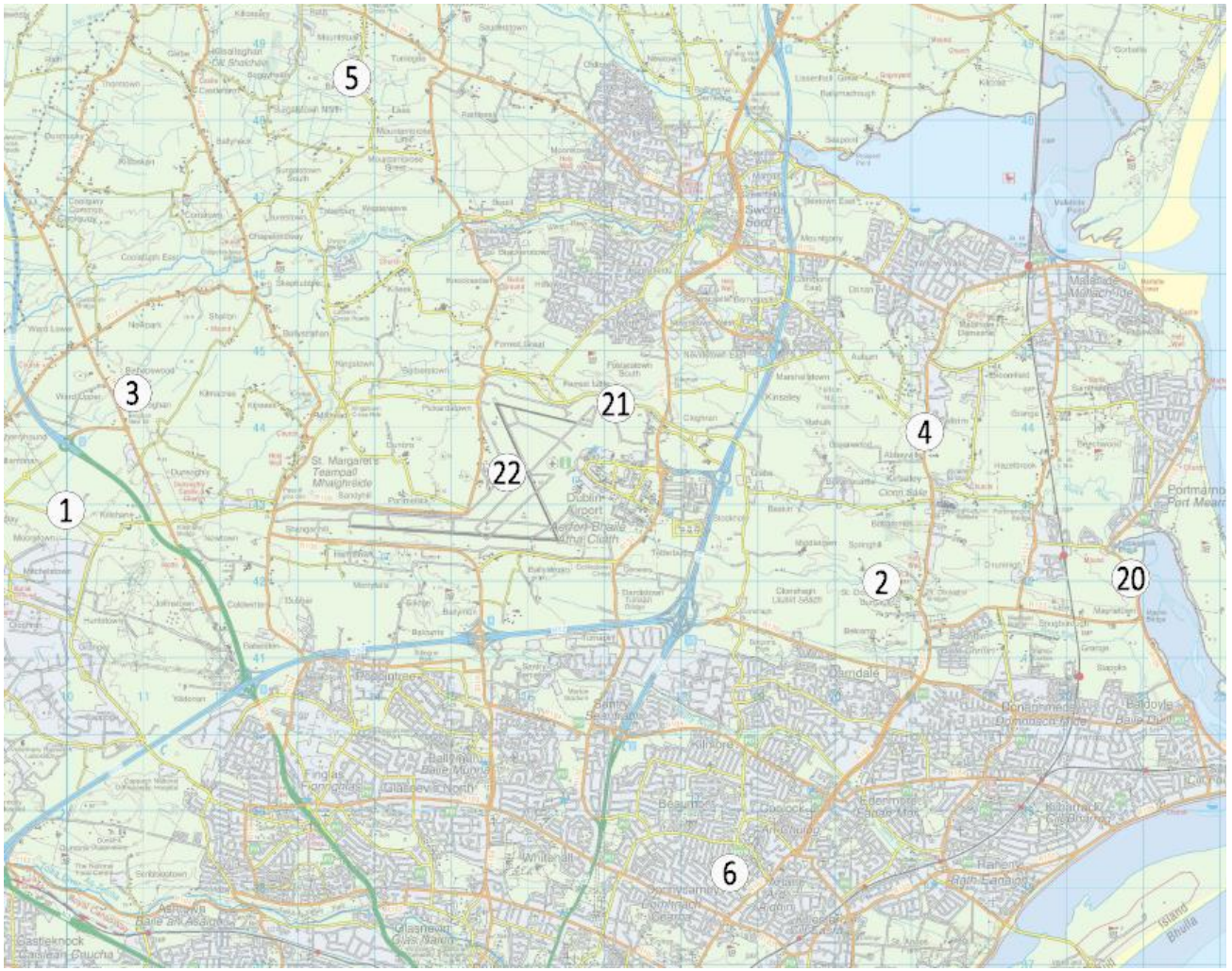
Dublin Monitor Locations Cont:



Dublin Monitors

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NMT1 Bay Lane

NMT2 St. Doolaghs

Dublin Noise and Flight Track Monitoring System (NFTMS)

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Comprises

- 9 Noise Monitoring Terminals
- Central hub
- A feed from the radar system

Operates continuously subject to maintenance

(On-time performance for NMTs 1 and 2 almost 100% Jan-Jun 2016)

Runs an internal calibration check every 6 hours

External calibration routinely conducted

Records both the overall levels of noise and also identifies aircraft events

Aircraft Event Correlation

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The noise monitors are set to record continuously, and trigger a noise event when the noise level exceeds a specific threshold level for a given length of time. The NFTMS then automatically correlates these noise events with aircraft movement data, assigning an aircraft movement to a noise event where applicable to give a set of correlated events.

By combining the noise levels for the aircraft events the NFTMS can determine the total aircraft noise separately to the overall noise from all sources.

Overall Noise Levels

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January to June 2016

NMT	Daytime Noise Level, $L_{Aeq,16h}$		Night Time Noise Level, $L_{Aeq,8h}$	
	Total	Aircraft	Total	Aircraft
1	63.8	62.5	58.4	57.1
2	62.4	60.7	56.8	55.4
3	62.9	49.6	54.9	47.0
4	56.6	41.5	52.1	38.3
5	54.9	49.2	57.3	48.1
6	61.6	46.7	56.5	45.5
20	63.7	57.2	57.6	52.2

Overall Noise Levels Daytime

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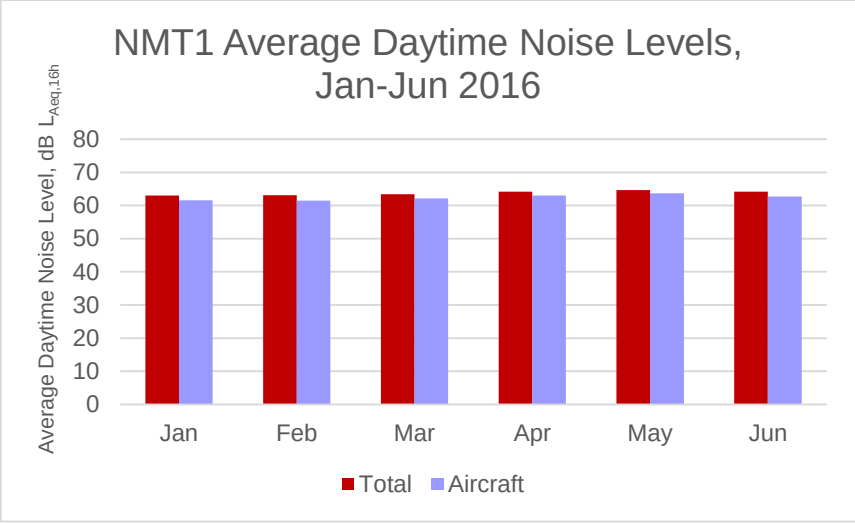
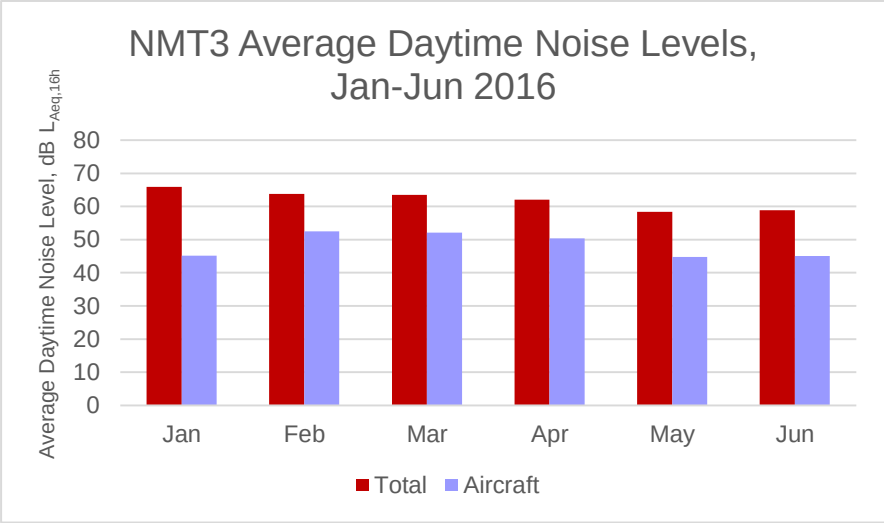
January to June 2016





Overall Noise Levels Night-time

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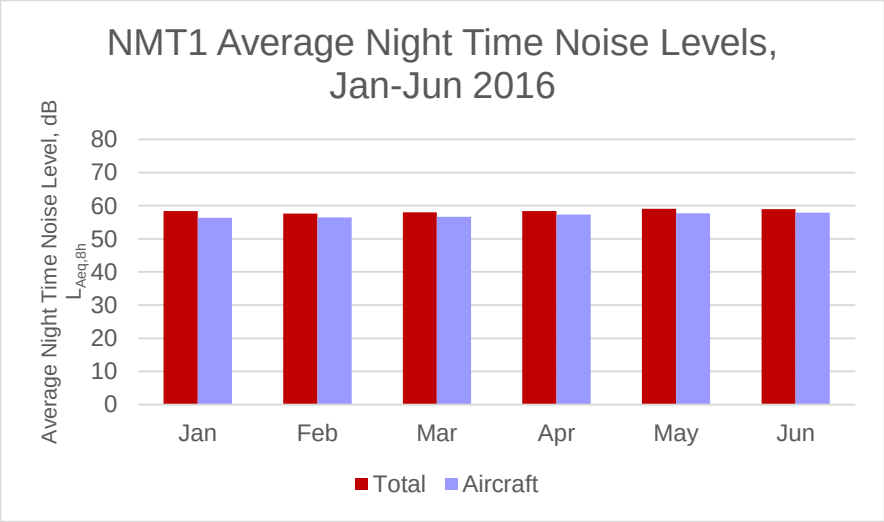
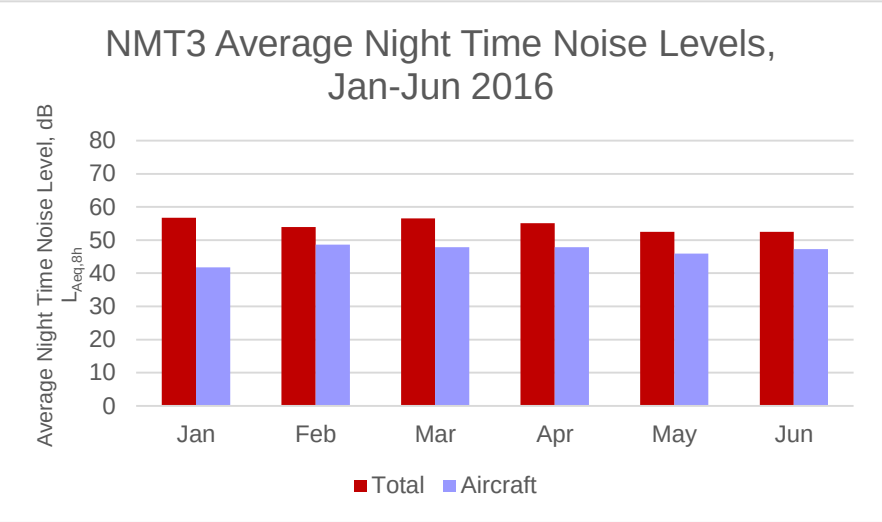
January to June 2016





Overall Levels - Interpretation

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For the $L_{Aeq,16h}$ metric:

- 63 dB is where the UK Government expects airport operators to offer acoustic insulation to noise-sensitive buildings, such as schools and hospitals, consequently it is commonly used as a threshold for noise mitigation
- The North Runway planning conditions use 63 dB for where a scheme for the voluntary noise insulation of existing dwellings is to apply. A scheme for all schools and registered pre-schools exposed to 60 dB is also required
- 69 dB is where the UK Government expects airport operators to offer households assistance with the costs of moving
- The North Runway planning conditions use 69 dB for where a scheme for the voluntary purchase of dwellings is to apply