Community Noise Report

Caddington

November – December 2022

London Luton Airport

Introduction

As part of the ongoing noise monitoring programme, London Luton Airport deployed a portable noise monitoring terminal in Caddington.

The purpose of the monitoring programme is to understand the typical noise levels created in the local community. For Caddington, it specifically related to the easterly arrival. The final approach flightpath is shown on the maps.

The noise monitor was located at a property in Caddington, approximately 220m north of the easterly arrival centerline at an altitude of 550 feet above sea level. The red pinpoint on the map shows the noise monitor location.

The noise monitor in Caddington was in place between 14th November and 21st December 2022.

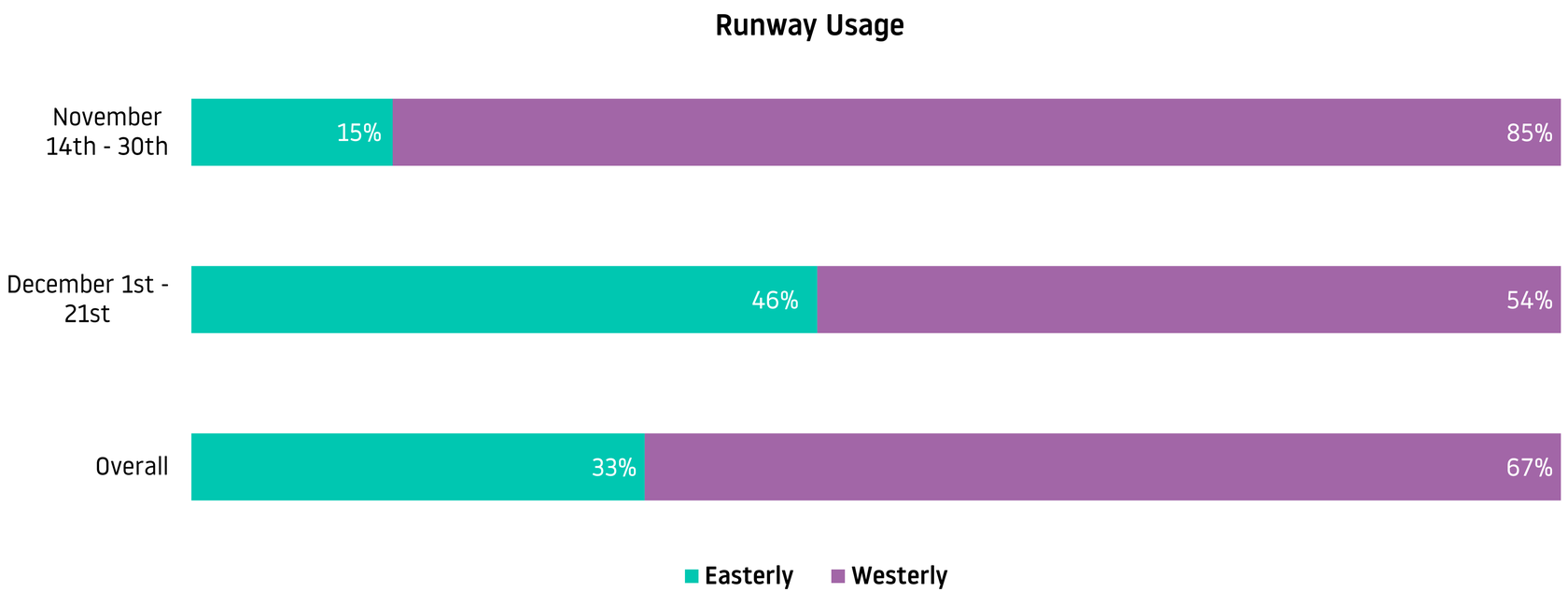
Aircraft noise and tracks recorded were extracted from LLA's noise and track-keeping system. This document evaluates the lateral and vertical positioning of aircraft near the monitor as well as the noise recorded at ground level.

LLA Operations During the Monitoring Period

There are two operating directions at LLA. The operating direction depends on the wind direction as aircraft are required to take off and land into the wind for aircraft performance and safety reasons. These are known as easterly operations and westerly operations and can change the aircraft tracks nearby specific areas. The split in operating direction varies from year to year and month to month. The amount of time that the runway operates in one direction depends on the wind direction.

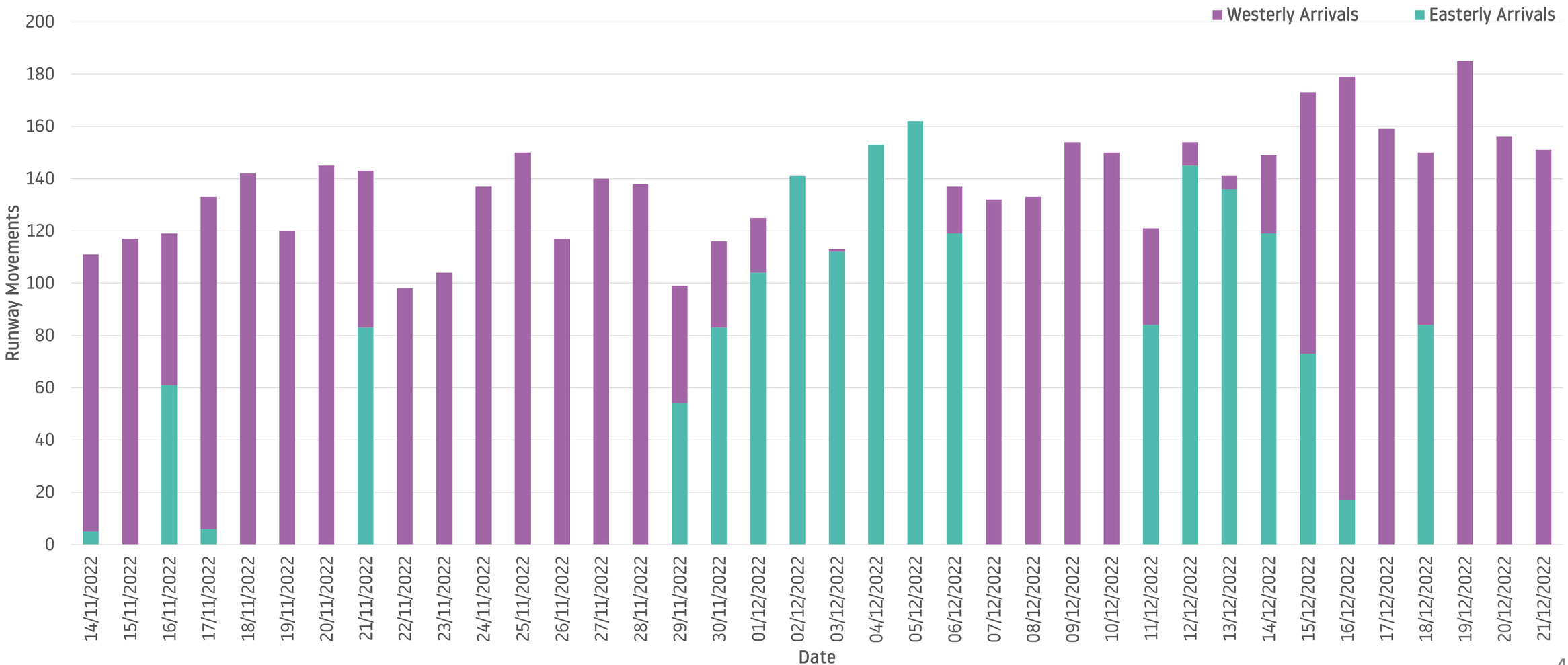
During the monitoring period, the direction of operation was 33% easterly and 67% westerly. The 5-year average for this time of year is 32% easterly vs 68% westerly.

There were 2,176 aircraft arriving on the easterly routes whilst the noise monitor was located in Caddington.



Daily Movements During Monitoring Period

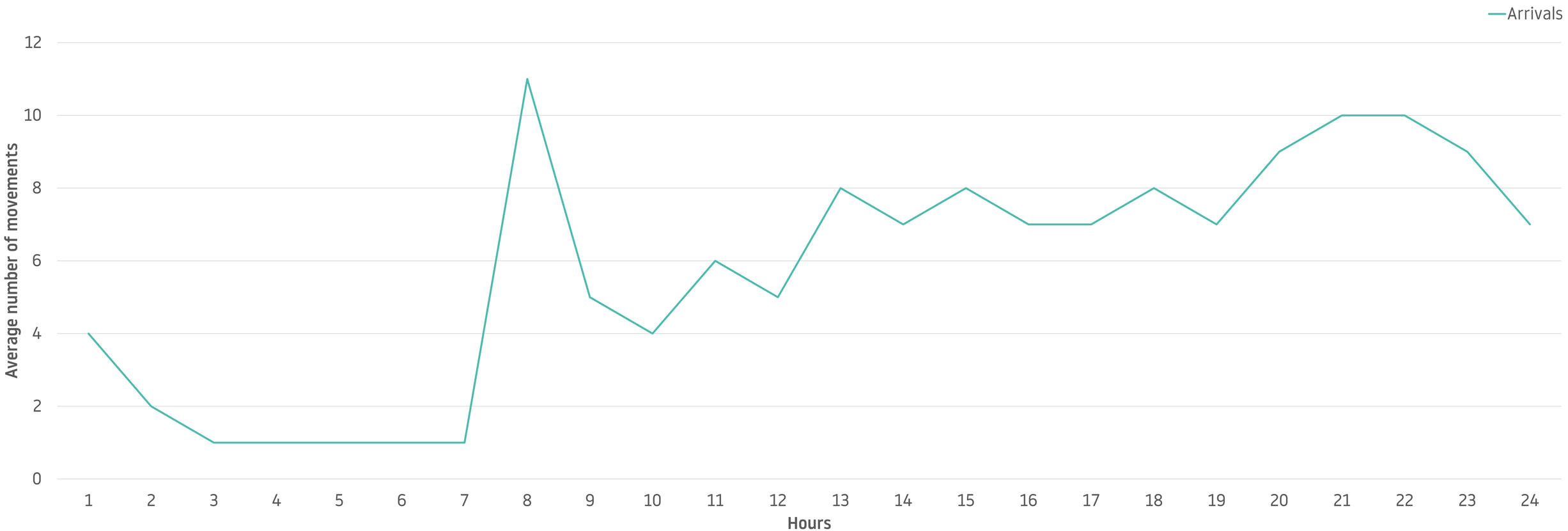
The chart below shows the number of daily arrivals that passed over the noise monitor. Due to the location of Caddington, all flights that landed whilst on easterly runway would have flown above or near the noise monitor terminal. The graph shows the easterly (green) as well as westerly arrivals (purple) on the other side.



Operations During the Monitoring Period

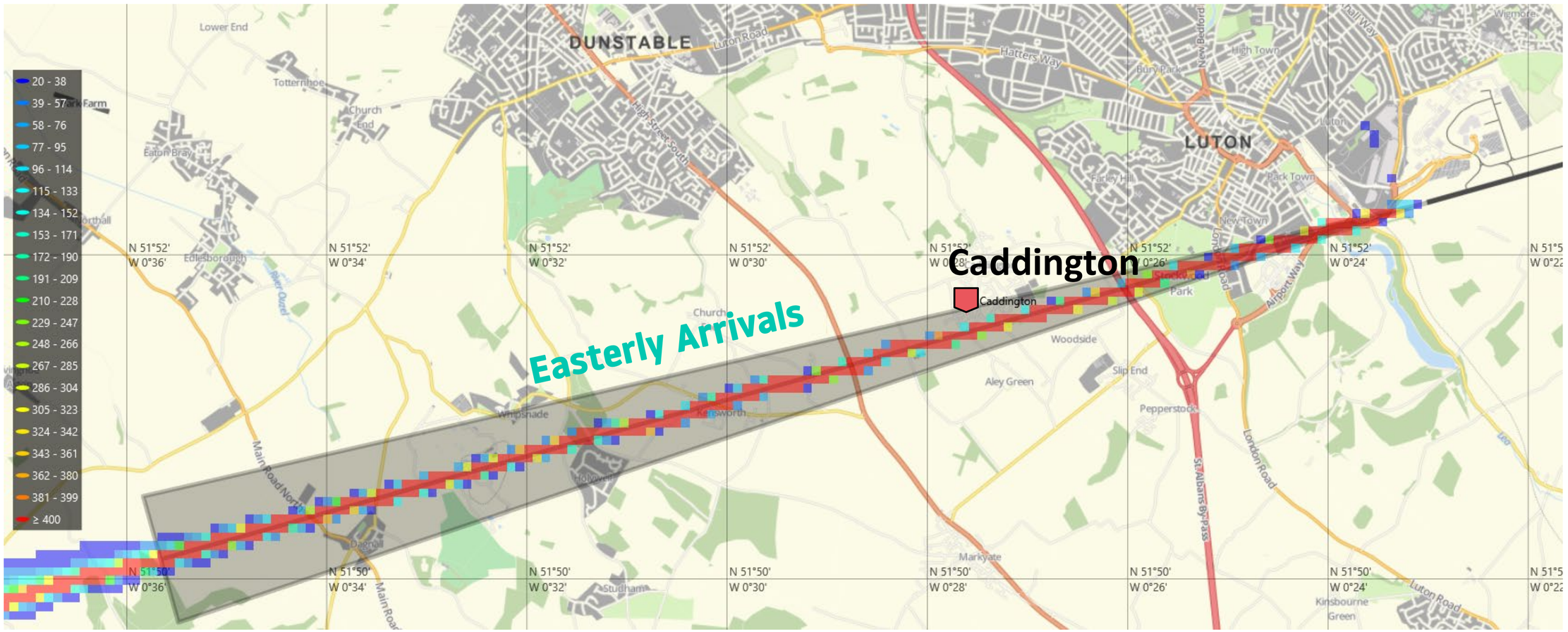
The graph below represents the average aircraft movement by hours during the monitoring period. Residents at this NMT location may notice the morning peak begins at 07:00 on easterly operations. On easterly operations, these aircraft would be at a lower altitude and more noticeable to residents as the dwellings at this location is directly underneath the easterly final approach glidepath.

During the night period of 23:00 – 06:59 in the monitoring period, there were average of 18 arrivals. Peak times for arrivals during the monitoring period was 07:00-08:00 and 19:00 -23:00.



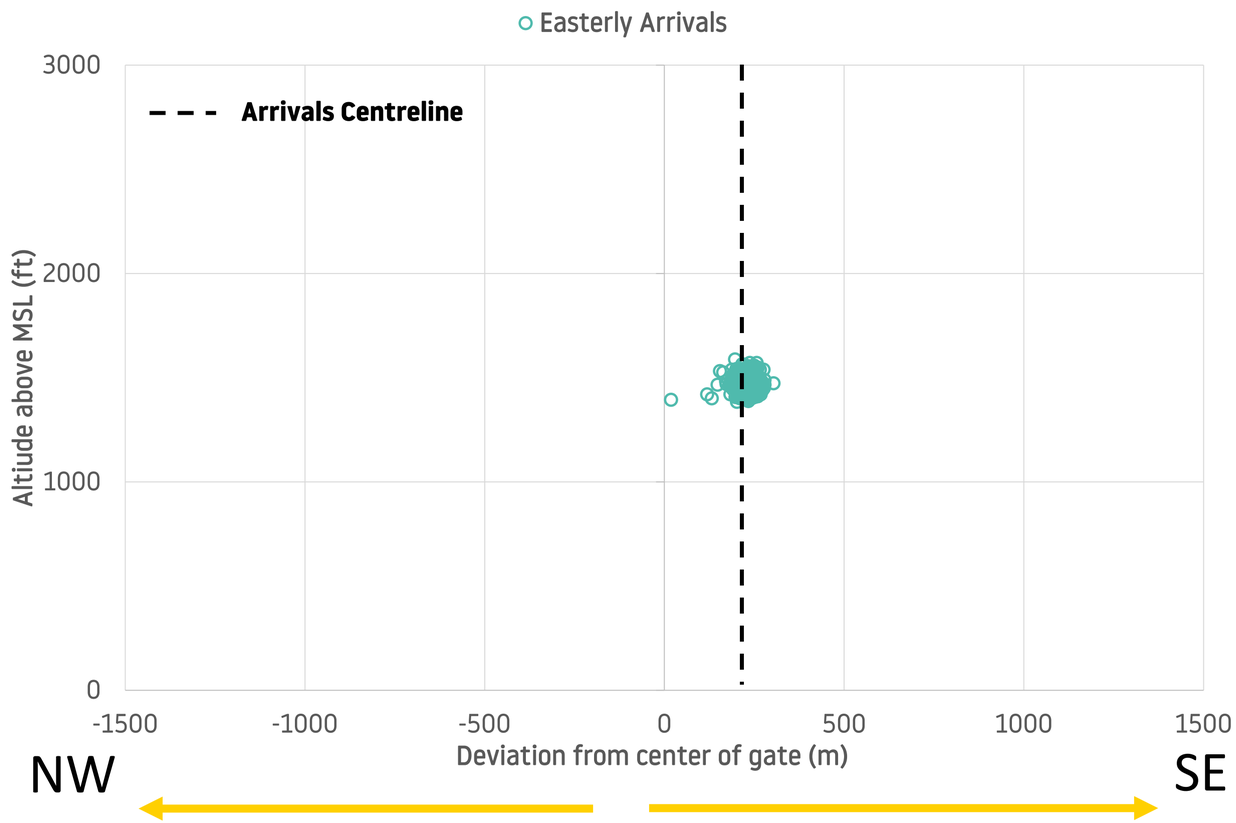
Aircraft Tracks

The heat map below show the representative flight tracks that passed near the noise monitor terminals during the monitoring period. The red pinpoint indicates the location of the noise monitor in Caddington. At this location, it is affected by easterly arrivals.



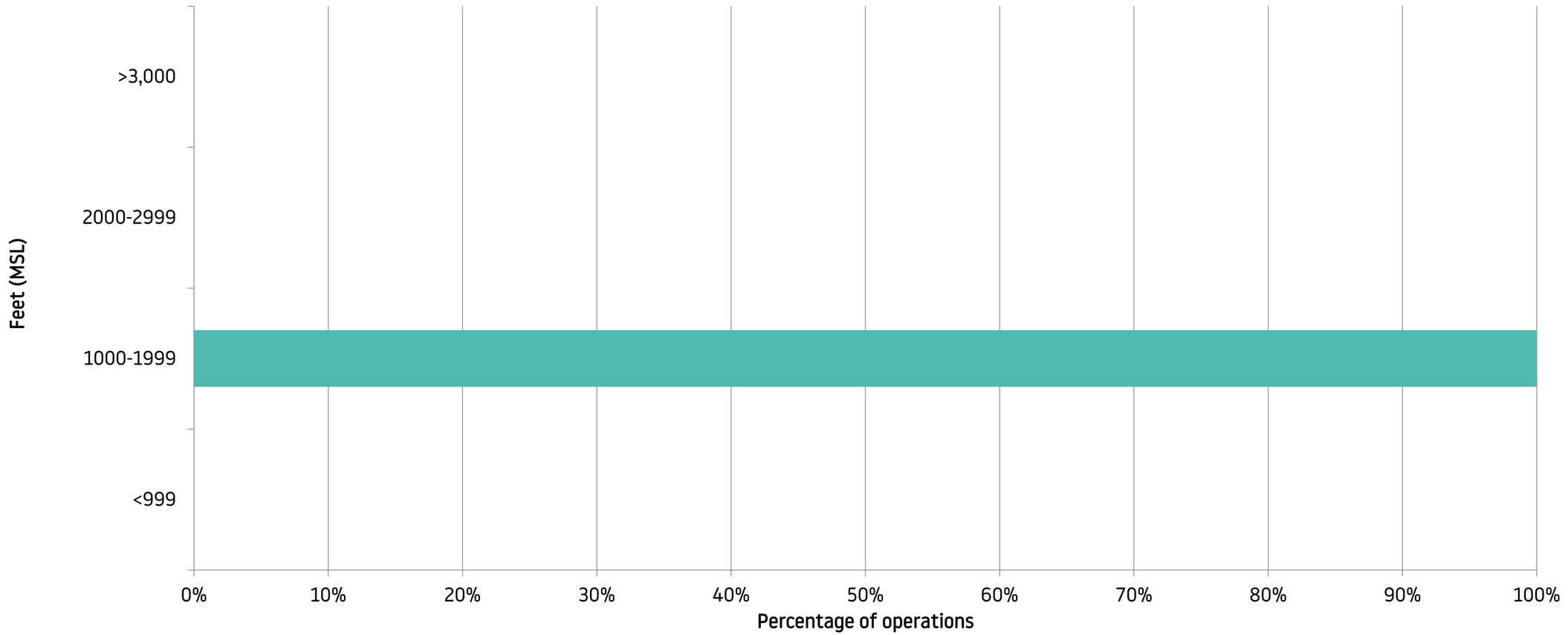
Altitude Gate Analysis

The altitude analysis for Caddington shows the vertical and lateral dispersion of aircraft 1.5km either side of the noise monitor. The map below shows the 3km gate which is drawn from northwest to southeast and it gathered information of every aircraft passing through the gate area. The scatter graph below shows the distance and altitude of aircraft from the noise monitor during the monitoring period. Each arrival aircraft will use ILS (Instrument Landing System), providing guidance to stay on the centreline as seen in the graph below. Residents in Caddington will see aircraft flying near Caddington on the days of easterly operations.



Altitude Gate Analysis – Easterly Arrivals

The average altitude of aircraft was 1,478 feet AMSL (928 feet AGL) when they reach above the noise monitor above Caddington. The bar chart on the below shows the percentage rate and altitude of aircraft arriving.



How Do We Analyse the Noise Data

Following the noise monitoring period, we collate the data taken from our Noise and Track Keeping system and analyse the noise reading samples.

During the monitoring period in Caddington, the noise monitoring terminal collected readings from 1,749 easterly arriving aircraft. During the period, there were 2,176 easterly arrivals.

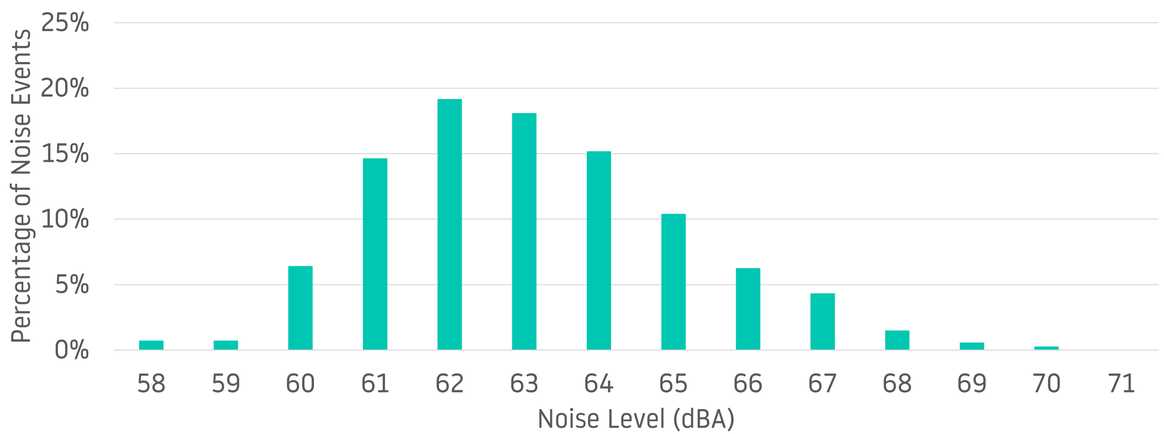
It is noteworthy that the noise monitor may not be able to record every aircraft noise event if the aircraft noise level is below ambient background noise. Therefore, there may be a difference between the number of actual air transport movements and number of aircraft noise events collected during the monitoring period.

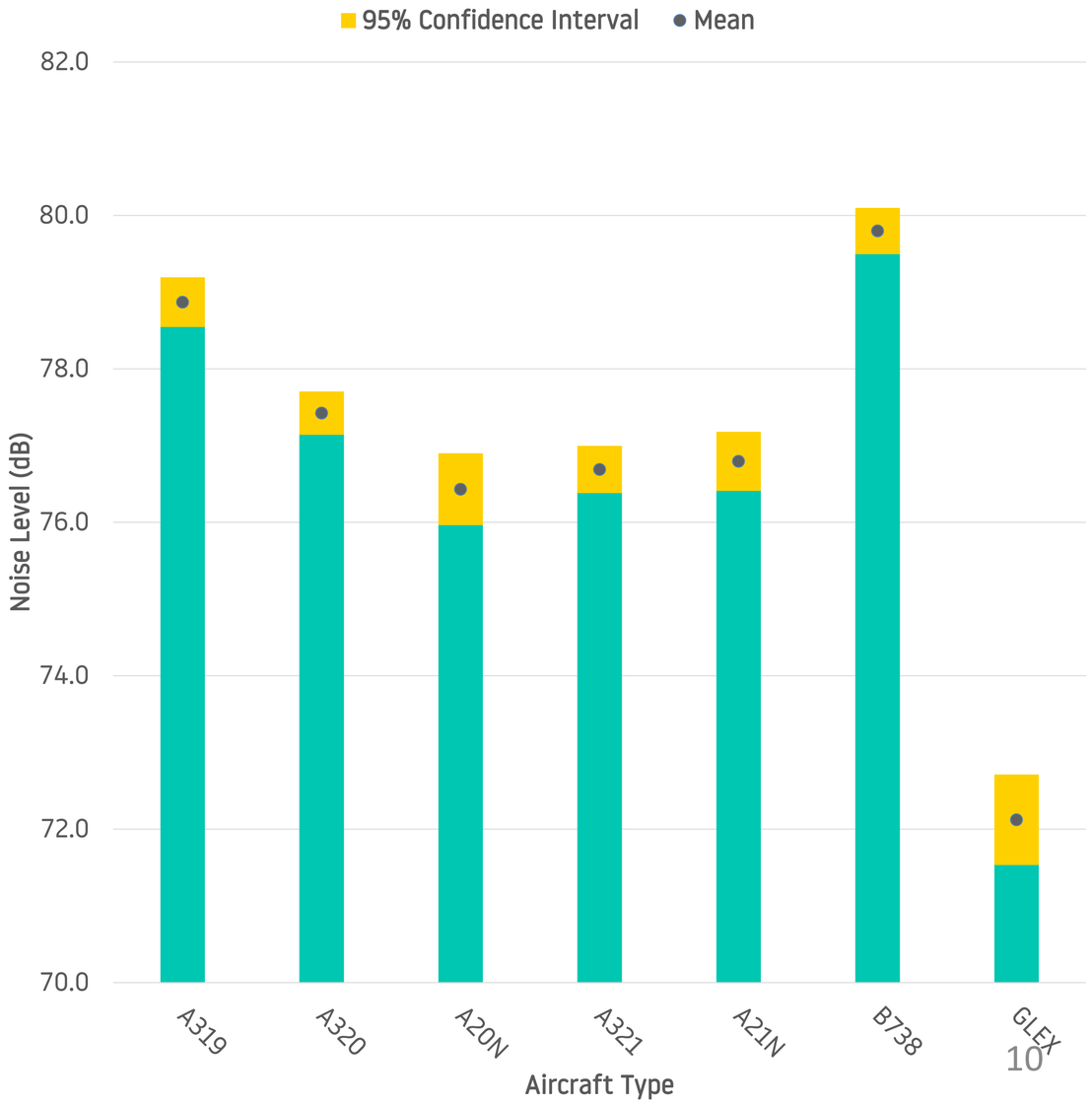
The weather also plays a big part in the data recorded and in periods of extreme weather i.e (very strong winds) the equipment can record noise incorrectly, so we exclude samples from the analysis during these weather conditions. When analysing the samples, the first thing we do is to ensure that there is no unusual noise event present which might not be caused by aircraft (i.e. vehicles, pets or wildlife). Some recordings were excluded from the analysis for the above reasons.

Noise Results – Easterly Arrivals

During the monitoring period, the noise recording samples were gathered from the most popular aircraft types at London Luton Airport*. The summary of the noise results is shown in this section. The tables show the average noise by aircraft type and the bar chart shows the uncertainty caused by the spread in readings and the sample size (95% confidence interval).

Aircraft Type*	Number of movements	Average Noise (dB)
A319	156	78.9
A320 CEO	363	77.4
A320 NEO (A20N)	108	76.4
A321 CEO	191	76.7
A321 NEO (A21N)	125	76.8
B737-800 NG (B738)	163	79.8
Global Express (GLEX)	46	72.1
All Aircraft Types	1,517	76.4





*The noise results shown in the analysis are only for those aircraft types that recorded more than 40 events per aircraft.

Noise Results - Summary

- In Caddington, residents may experience aircraft noise when the airport is operating in the easterly direction as the arrival aircraft follow the final approach flightpath in a straight line towards the runway at low altitude. The arrival flightpath is directly above Caddington so therefore the aircraft noise would be more noticeable at this location.

- On easterly operation, the average departure noise measured was 76.4dB, based on a sample size of 1,517.

- From the results, Luton's most popular aircraft type by operators, Airbus A320 CEO, had an average noise of 77.4dB.

- The departure noise from the newer generation aircraft, A320 NEO, produced less noise than A320 CEOs, at an average of 1.0dB quieter at departure in Caddington.

- During the monitoring period, 17% of the movements were newer generation aircraft which are more fuel efficient and quieter.

- The Boeing B738 was the noisiest aircraft type at Caddington. This aircraft type registered at average of 79.8dB.

Conclusion

- A mobile noise monitor was installed at a residential property in Caddington for six weeks.
- For Caddington, it specifically related to easterly arrivals and westerly departures. During the monitoring period, the airport operated in the direction of easterly and westerly for 33% and 67% of the time, respectively. Generally, over the year, LLA operate in the westerly direction for 70% of the time due to the prevailing wind.
- The track data shows most arriving aircraft are concentrated on the Instrument Landing System (ILS) glidepath and its centreline.
- The average altitude of easterly arrival aircraft in Caddington is 1,460 feet above mean sea level (AMSL), as Caddington is already approximately 550 feet AMSL, aircraft will typically be at 910 feet above ground level (AGL) in this area.
- The main aircraft type operating at London Luton Airport is the Airbus A320 CEO which produced an average noise of 77.4dB.
- The A320 NEO registered average arriving noise of 76.4dB, 1.0dB lower than A320 CEOs.
- During the monitoring period, 17% of the noise events recorded in Caddington were created by the newer generation aircraft, A320 NEO, A321 NEO and B737 Max 8.
- LLA publish other monitoring reports and newsletter on a regular basis. These reports can be viewed and downloaded from the Noise webpage on the LLA website - https://www.london-luton.co.uk/corporate/community/noise.

Glossary of Terms

Easterly Operations: As aircraft take off and land into the wind , easterly operations refers to the time when the wind is blowing from the east and aircraft land on the easterly runway and would fly above Caddington, when they line up towards the easterly runway on final approach.

Aircraft Movement: A single aircraft departing or arriving at the airport.

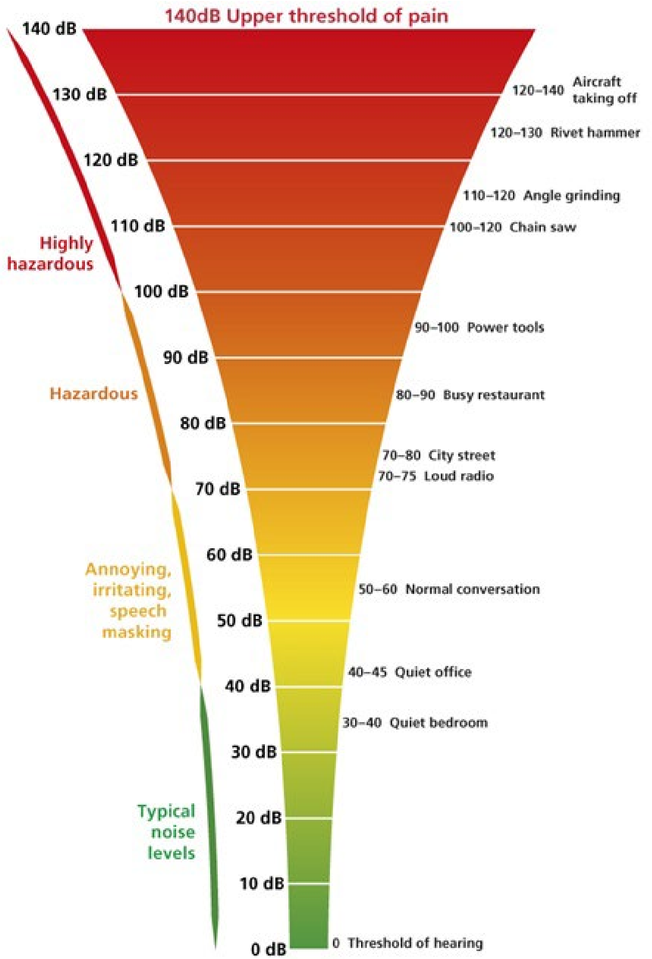
Altitude Gate Analysis: A gate which is drawn across an area and will gather flight date about every aircraft passing through the gate area.

Noise Event: A single event is the period from when an aircraft approaches the monitor until when the aircraft is leaving the area.

Decibel (dB): The unit used to measure noise (typically 50-60dB is equivalent to a normal conversation level).

LasMax: A unit of measure and is the maximum noise level from a single aircraft passing over the noise monitor.

95% Confidence Interval: A range of values that you can be 95% certain contains the population mean.



Source: iosh.co.uk