# Community Noise Report

Caddington

04 May – 25 July 2023

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 easterly arrivals. The final approach flightpath are shown on the map.**

The noise monitor was located at a residential property on Crosslands Road, approximately 188m northwest of the easterly arrival centreline, at an altitude of 549 feet above sea level. The red pinpoint on the map shows the noise monitor location.

The noise monitor in Caddington was in place between the 4th May 2023 and 25th July 2023.

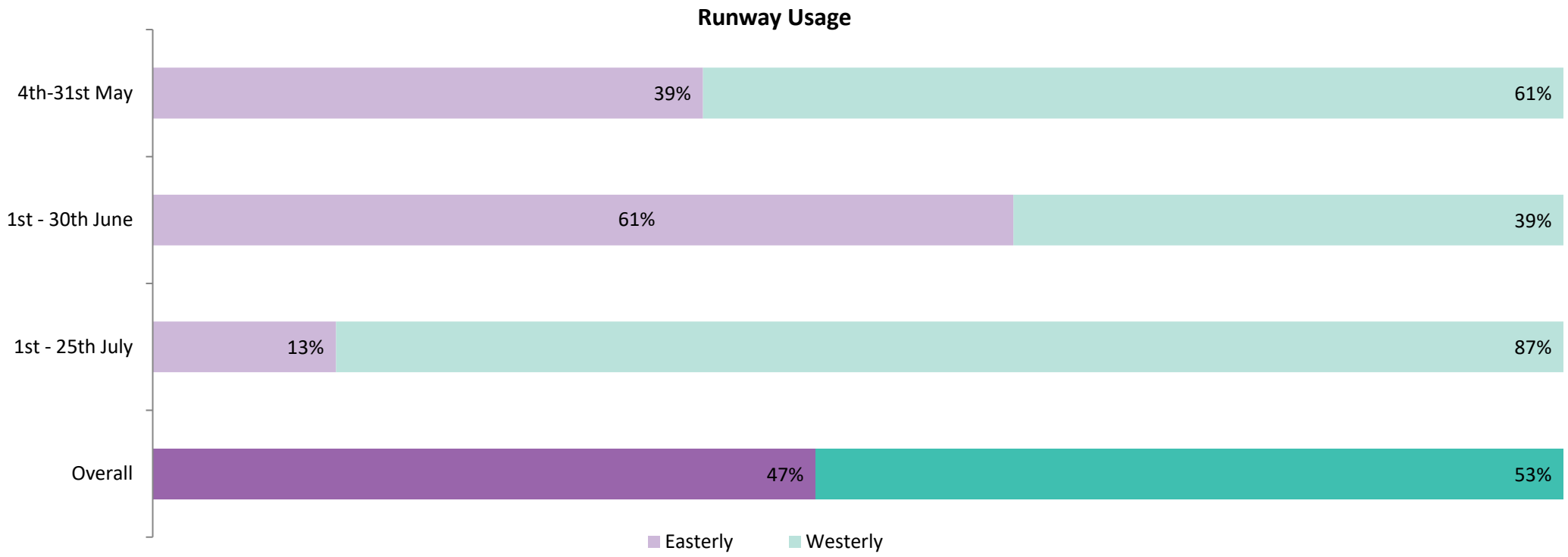
Aircraft noise and tracks recorded were extracted from LLA's noise and track-keeping system. This document evaluates the lateral and vertical positioning of aircraft near the monitor as well as the noise recorded at ground level.

# 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.

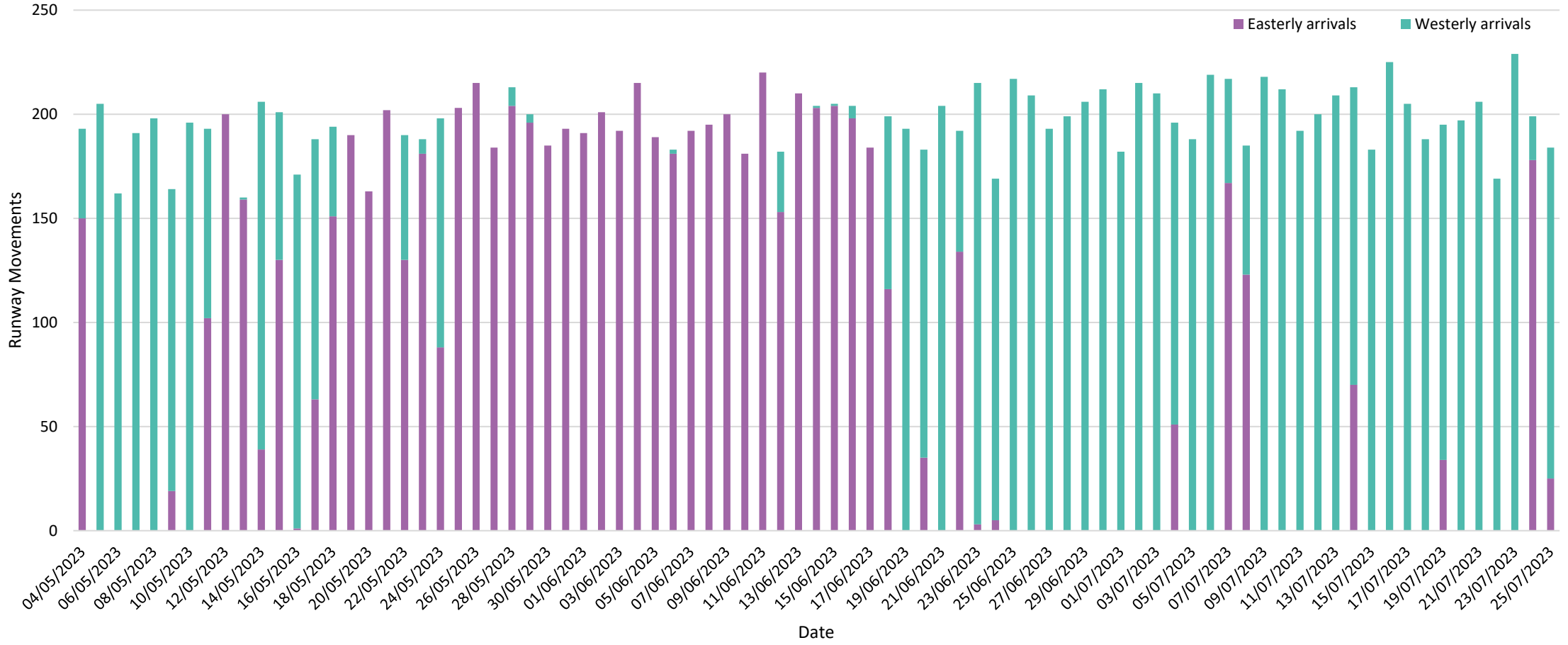
During the period of monitoring, the direction of operation was 47% Easterly and 53% Westerly. The 5-year average for this time of year is 30% easterly vs 70% westerly.

There were 5,067 aircraft arriving on the easterly route in Q2 2023.



# Daily Movements during monitoring period

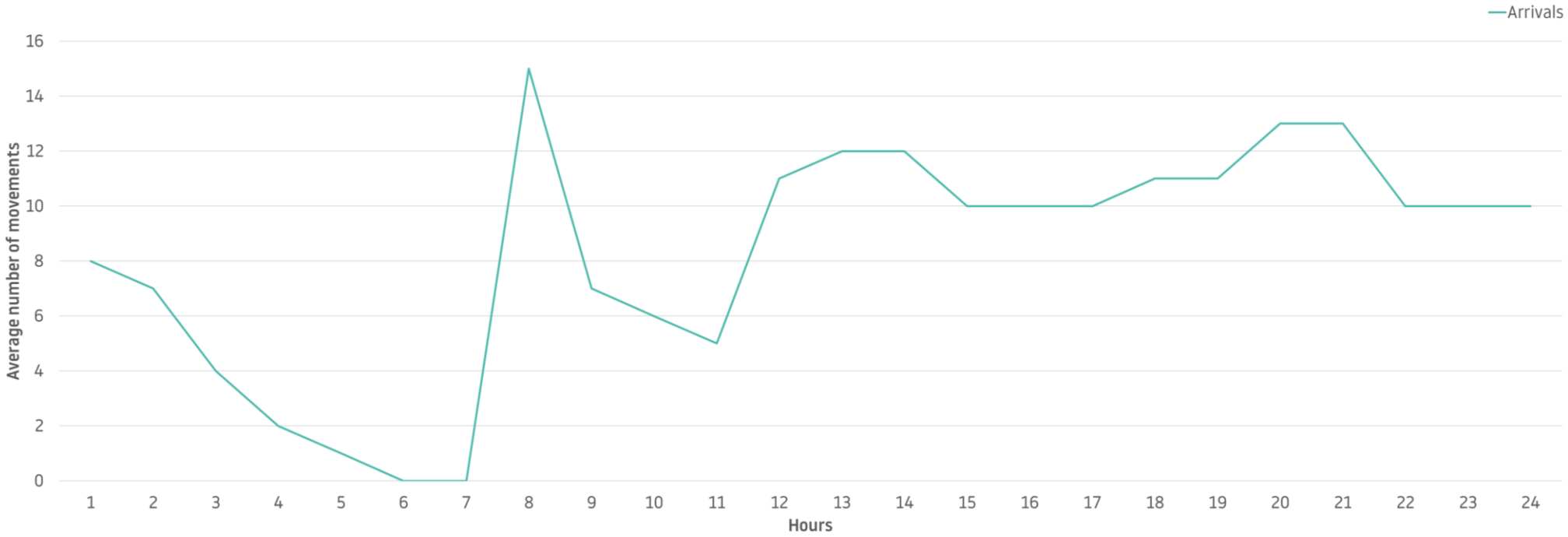
The chart below shows the number of daily easterly arrivals that passed over the noise monitor. Due to the location, all flights that landed on our easterly runway would have flown above the noise monitor terminal. The graph shows the easterly (purple) as well as westerly arrivals (green) on the other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



# Operations during monitoring period

The graph below represents the average aircraft movement by hours during the monitoring period. Depending on the operating direction on the day, residents in Caddington may experience different flight patterns. During the peak periods, residents of Caddington may notice more frequent aircraft movements. In general, the morning peak starts at 8am on the days of easterly operation and these aircraft would be lower at altitude and more noticeable as the dwellings at this location are just next to the easterly final approach flightpath.

During the night period of 23:00 – 06:00 in the monitoring period, there were average of 32 arrivals.

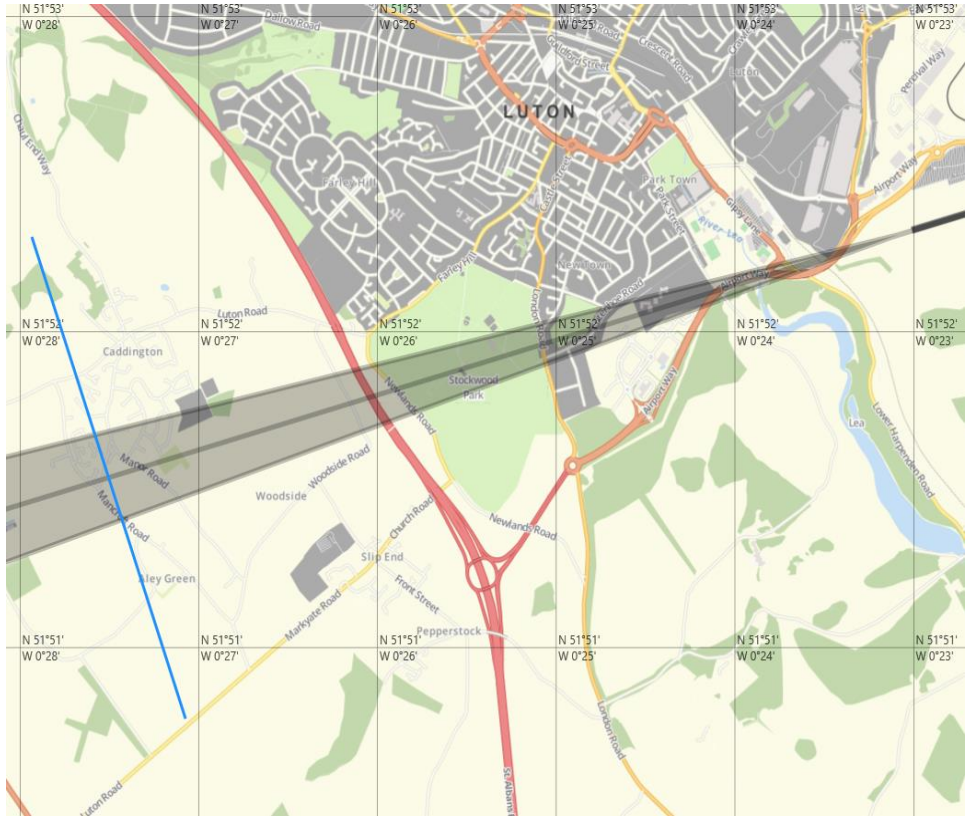


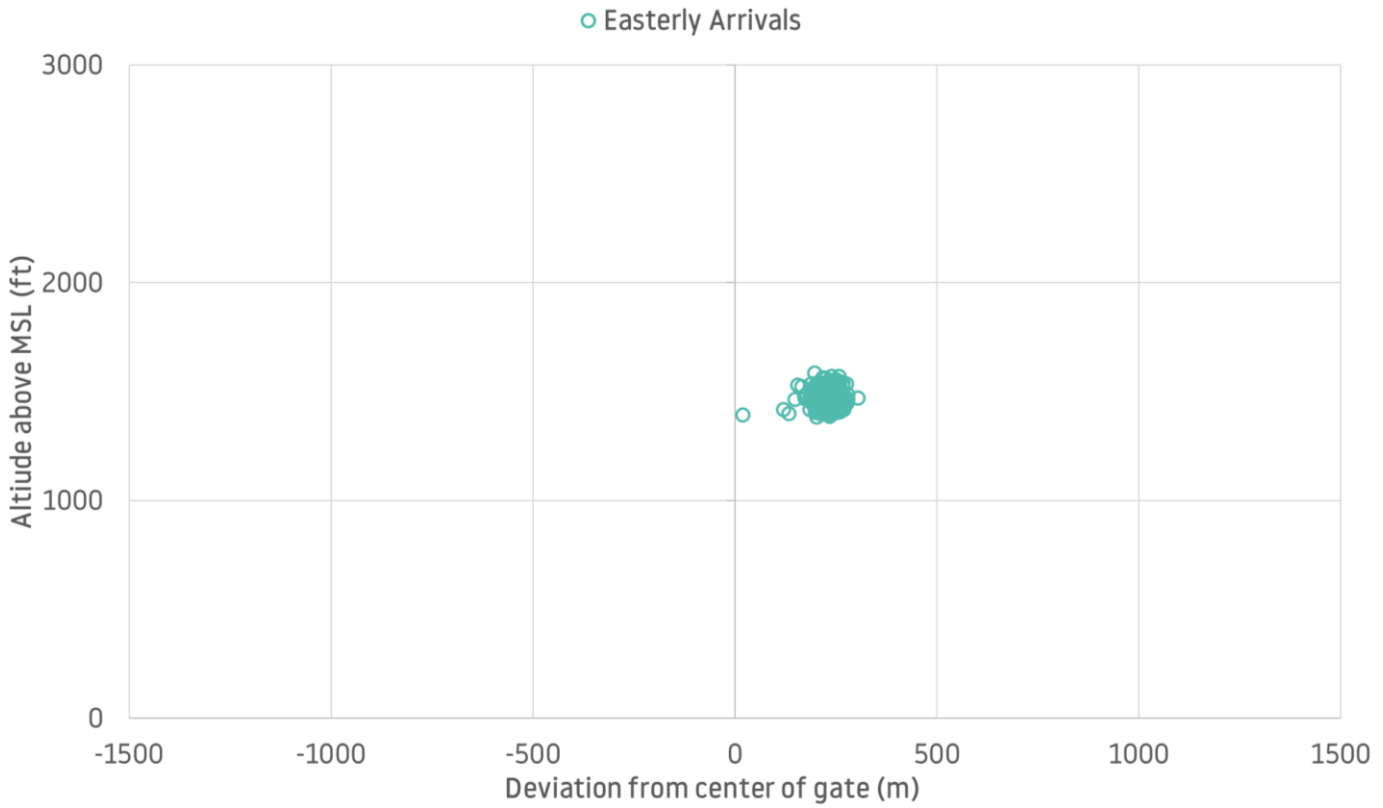
# Aircraft Tracks

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. This location is affected by easterly arrivals.

# Altitude Gate Analysis

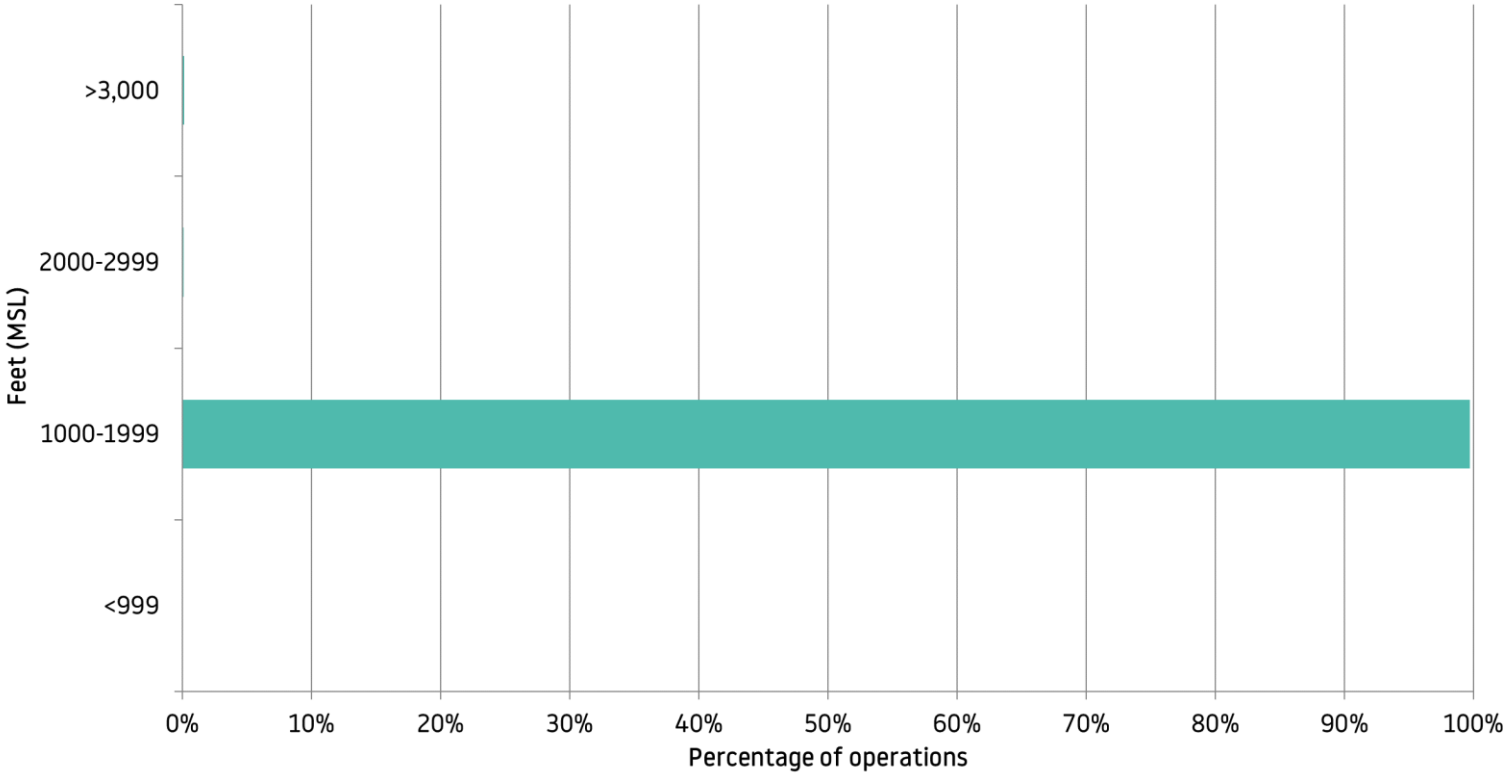
The altitude analysis for Caddington, shows the vertical and lateral dispersion of aircraft 1.5km either side of the noise monitor. The map below shows the 3km gate which is drawn perpendicular to the NPR from north-northwest to south-southeast and it gathered information of every aircraft passing through 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 1,477 feet AMSL (925 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.




| Aircraft Type | Number of movements detected | Average Altitude (AMSL in ft) |
|---|---|---|
| A306 | 45 | 1469 |
| A319 | 988 | 1490 |
| A320 CEO | 1337 | 1468 |
| A320 NEO (A20N) | 790 | 1482 |
| A321 CEO | 567 | 1454 |
| A321 NEO (A21N) | 892 | 1483 |
| B737-800 NG (B738) | 686 | 1485 |
| B737 Max 8 (B38M) | 196 | 1469 |
| Global Express (GLEX) | 211 | 1475 |
| Cessna 560X (C56X) | 169 | 1487 |
| Gulfstream G560 (GLF6) | 113 | 1492 |
| All | 5,994 | 1,477 |

# How 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 7,087 easterly arriving aircraft. During the period, there were 7,598 easterly arrivals.

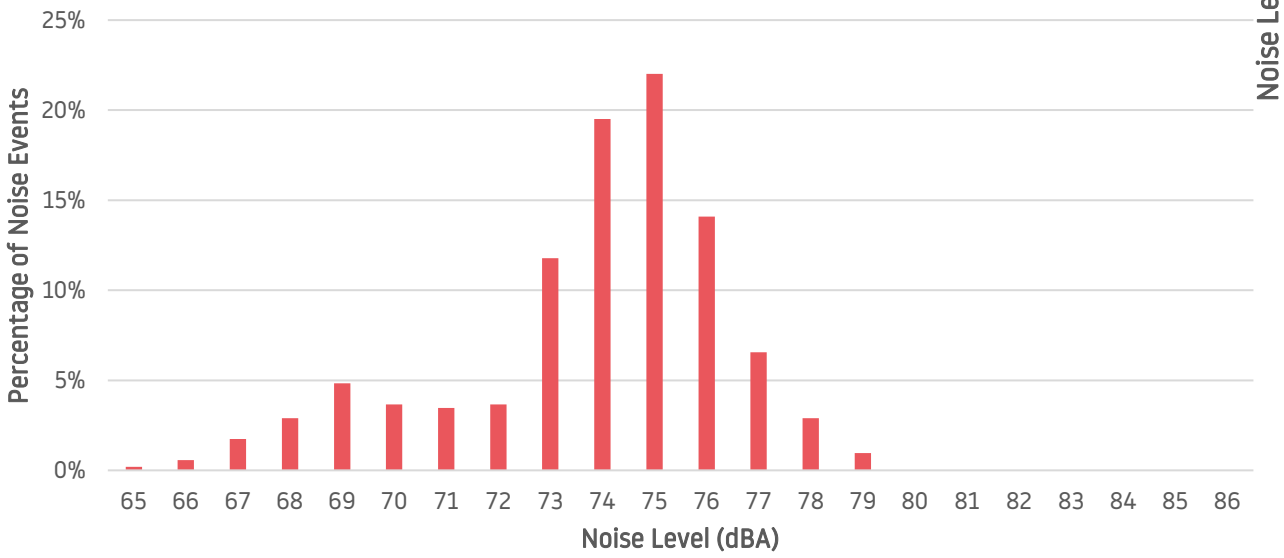
It is noteworthy that the noise monitor may not be able to record every aircraft noise event if the aircraft noise level is below ambient background noise. Therefore, there may be a difference between the number of actual air transport movements and number of aircraft noise events collected during the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

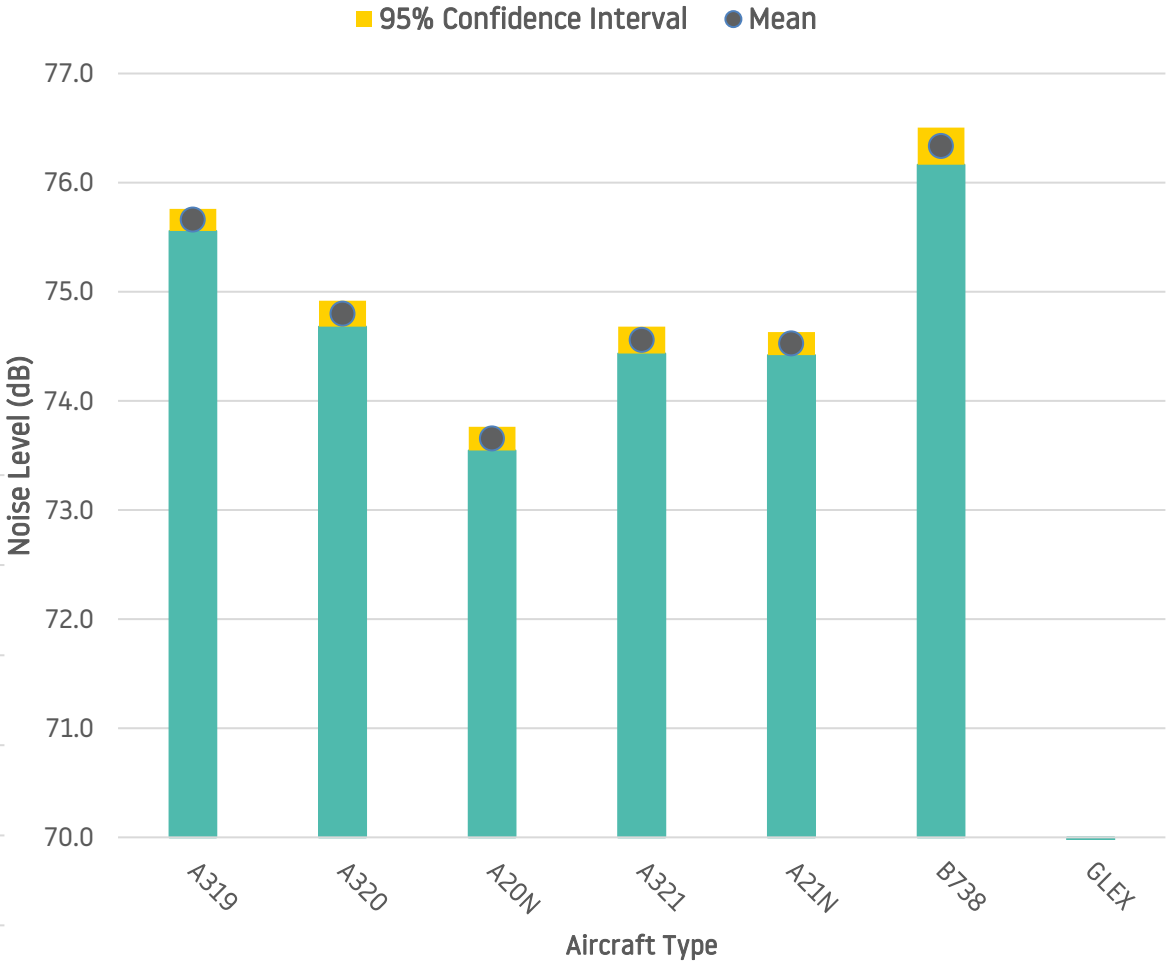
The weather also plays a big part in the data recorded and in periods of extreme weather i.e (very strong winds) the equipment can record noise incorrectly, so we exclude samples from the analysis during these weather conditions. When analysing the samples, the first thing we do is to ensure that there is no unusual noise event present which might not be caused by aircraft (i.e. vehicles or wildlife). A total of 259 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) |
|---|---|---|
| A306 | 4 | 78.3* |
| A319 | 156 | 75.7 |
| A320 CEO | 363 | 74.8 |
| A320 NEO (A20N) | 108 | 73.7 |
| A321 CEO | 191 | 74.6 |
| A321 NEO (A21N) | 125 | 74.5 |
| B737-800 NG (B738) | 163 | 76.3 |
| B737 Max 8 (B38M) | 6 | 74.8 |




*The noise results shown in the analysis are only for those aircraft types that recorded more than 100 events per aircraft (A306 and B737 Max 8 included for comparison).

# Noise Results - Summary

- Crosslands residents in Caddington, may experience louder 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 average easterly arrival noise in Caddington was 75.3dB, based on a sample size of 7,087.

- From the results, Caddington's most popular aircraft type by operators, Airbus A320 CEO, had an average noise of 74.8dB (arrival).

- The departure noise from the newer generation aircraft, A320 NEO, produced less noise than A320 CEOs, at an average of 1.1dB quieter. Similarly, the Boeing 737 series, the new B737 Max 8 was 1.5dB quieter than its predecessor B737-800NG. Around 33% of all noise results movements were newer generation aircraft which are more fuel efficient and quieter.

- The freight aircraft A306 was one of the noisiest aircraft types at Caddington. This aircraft type is generally deployed in the daytime period.

# Conclusion

- A mobile noise monitor was installed at a residential property on Crosslands Road from the beginning May to the end of July 2023.
- For Caddington, it specifically related to easterly arrivals. During the monitoring period, the airport operated in the direction of easterly and westerly for 47% and 53% 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 main aircraft type operating at London Luton Airport is the Airbus A320 CEO which produced an average noise of 74.8dB for easterly arrival.
- 33% of the noise events recorded in Caddington were created by the newer generation aircraft, A320 NEO, A321 NEO and B737 Max 8. The A320 NEO registered average departing noise of 73.8dB, 1.1dB lower than A320 CEOs. More noticeably, the B737 Max 8 was significantly quieter than its predecessor B737-800NG with a difference of 1.5 dB.
- During the monitoring period, 89 arrival aircraft (easterly) were investigated as part of the Noise and Track violation scheme. Of these, 16 aircraft were fined. All fines generated by this scheme go directly into the community trust fund, more information on the community trust fund can be found on https://www.london-luton.co.uk/corporate/community/community-trust-fund.
- LLA publish other monitoring reports 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

**Westerly Operations:** As aircraft take off and land into the wind, westerly operations refers to the time when the wind is blowing from the west and aircraft follow the departure route in the direction of South Luton.

**Easterly Operations**: 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 South Luton.

**Standard Instrument Departure (SID):** Published route that an aircraft must follow on departure.

**Noise Preferential Route (NPR):** All aircraft except propeller aircraft leaving London Luton Airport should follow flight paths known as Noise Preferential Routes (NPRs) up to an altitude of 3,000 feet or 4,000 feet depending on the route. They lead from the runway to the main UK air traffic routes and form the first part of the Standard Instrument Departure routes (SIDs).

**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.