# Community Noise Report

## Dagnall

May – June 2022

London Luton Airport

# Introduction

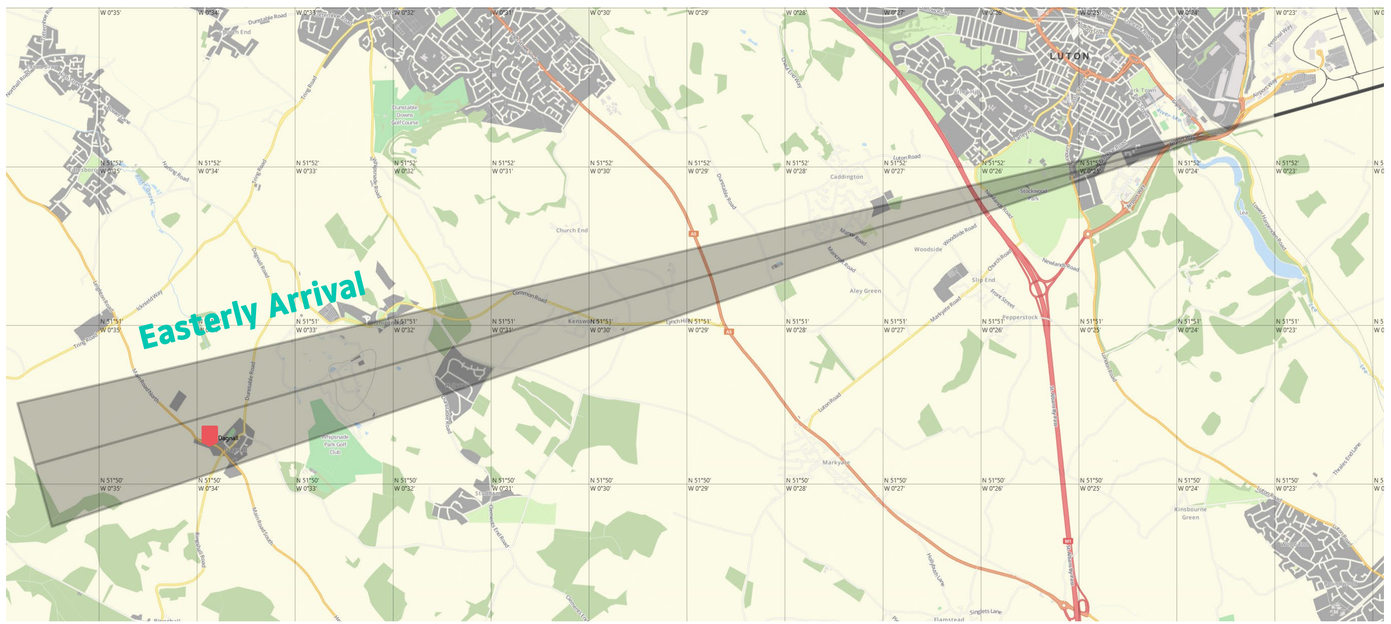
As part of the ongoing noise monitoring programme, London Luton Airport deployed a portable noise monitoring terminal in Dagnall.

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

The noise monitor was located at a property on Main Road North, underneath the easterly arrivals, at an altitude of 452 feet above sea level. The red pinpoint on the map shows the noise monitor location.

The noise monitor in Dagnall was in place between 7th May and 23rd June 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.

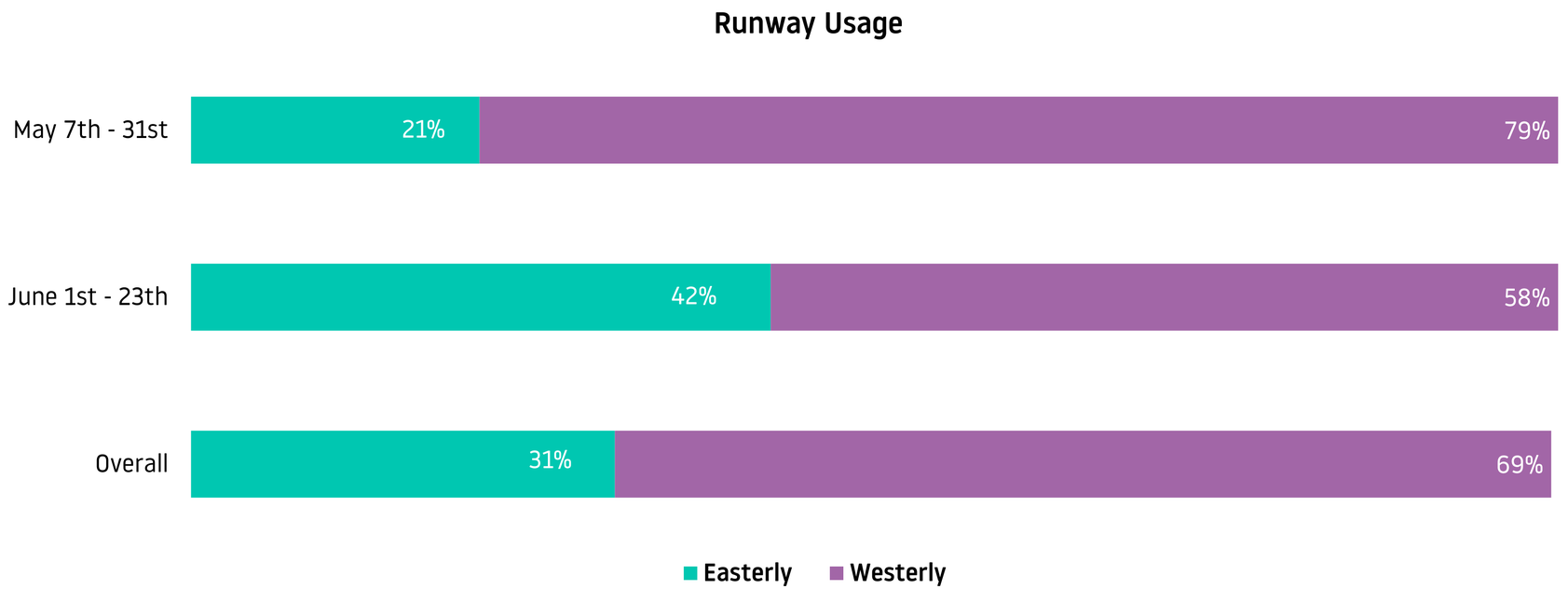


# LLA Operations During the Monitoring Period

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.

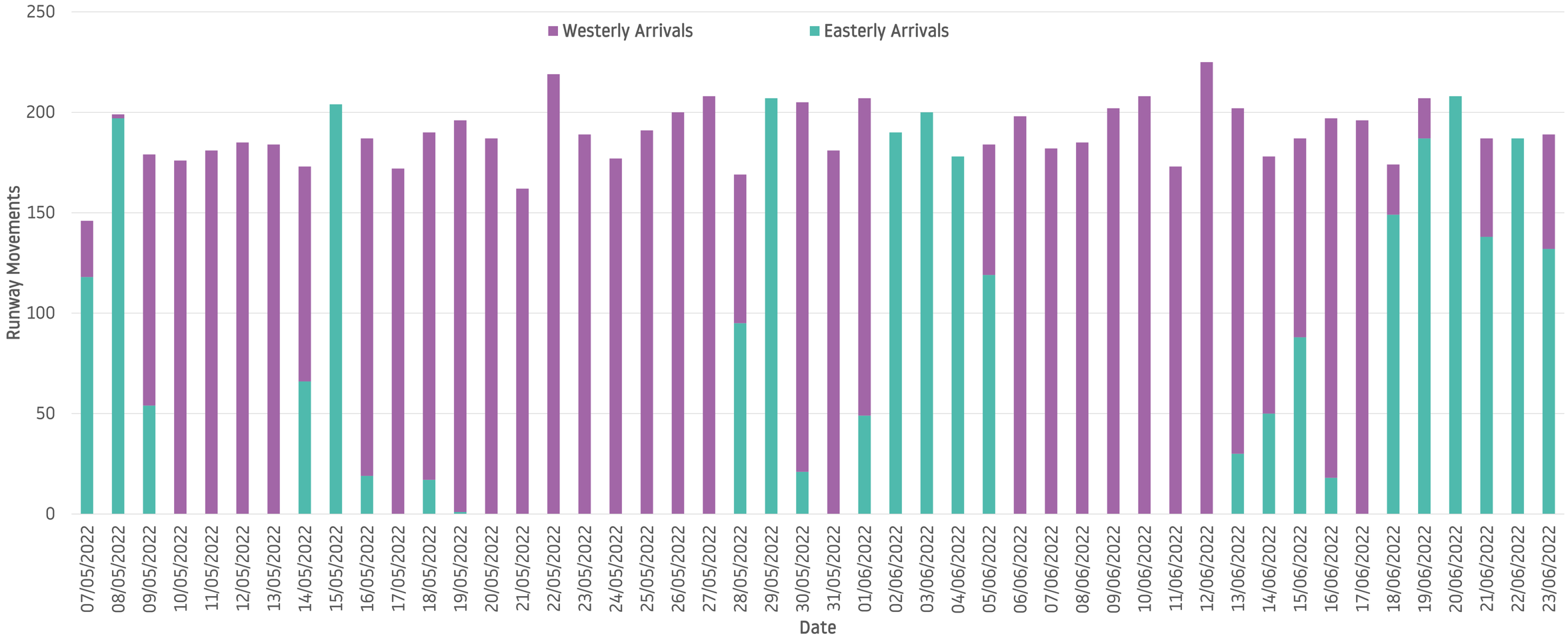
During the monitoring period, the direction of operation was 31% easterly and 69% westerly. The 5 year average for this time of year is 41% easterly vs 59% westerly.

There were 9,151 aircraft arrival on the easterly routes whilst the noise monitor was located in Dagnall.



# Daily Movements During Monitoring Period

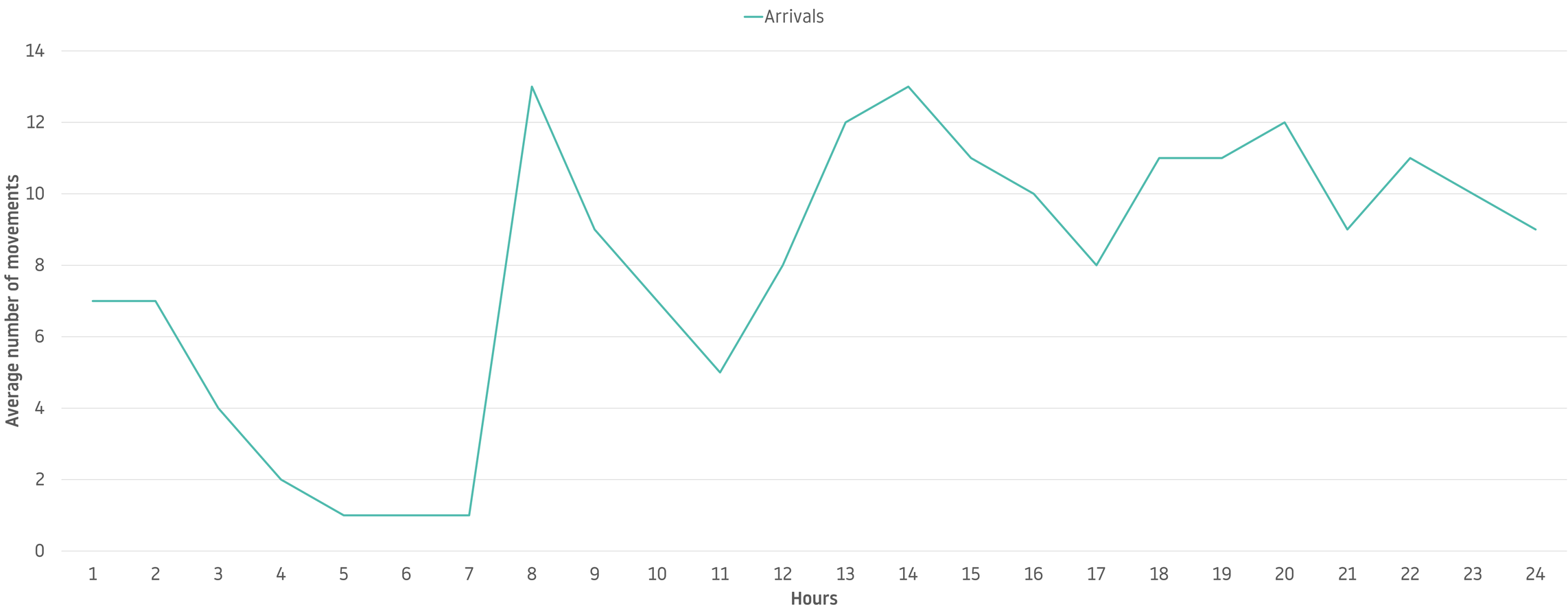
The chart below shows the number of daily arrivals that passed over the noise monitor. Due to the location of Dagnall, all flights that have landed whilst on easterly runway would have flown above the noise monitor terminal. This graphs shows the easterly arrivals (green) as well as westerly arrivals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



# Operations During the Monitoring Period

The graph below represents the average aircraft movement by hours during the monitoring period. During the peak periods, local residents of Dagnall may notice more frequent aircraft movements. Shown below highlights the peak periods, during a 24hr period which were between 0800-0900, 1300-1500 and 1900-2100.

During the night period of 23:00 – 06:00 in the monitoring period, there were average of 31 arrivals.

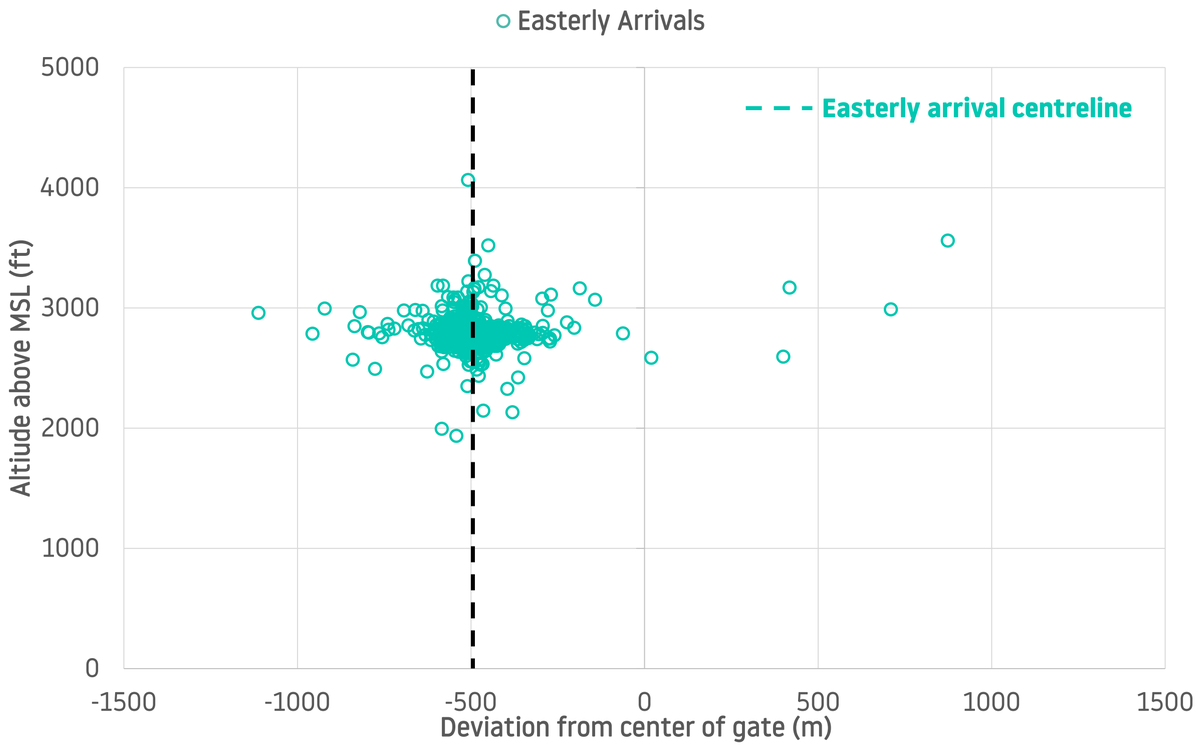


# Aircraft Tracks

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 Dagnall. At this location, it is affected by easterly arrivals.

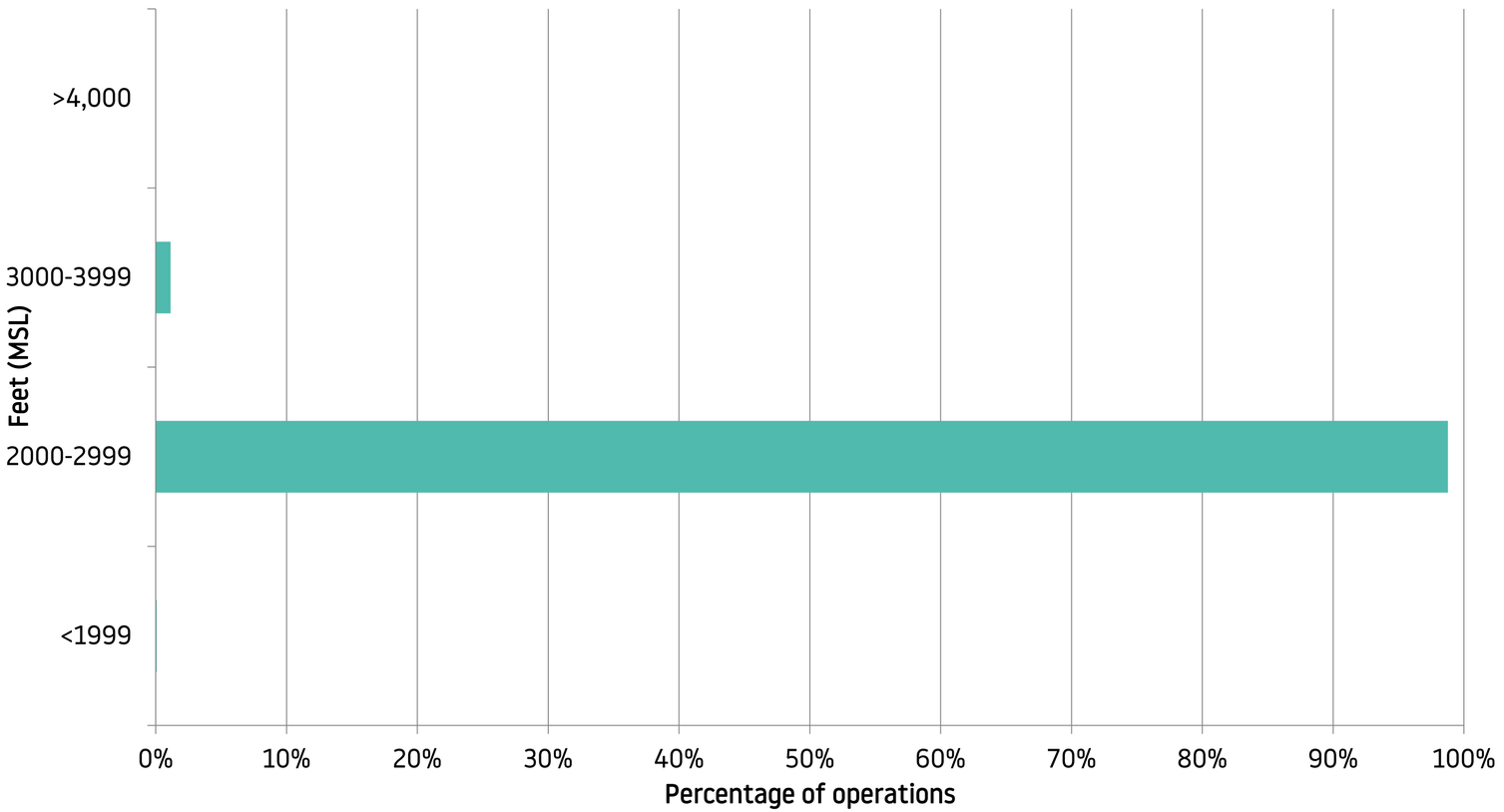
# Altitude Gate Analysis

The altitude analysis for Dagnall 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 runway extended centreline 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. Residence in Dagnall will see aircraft flying near Dagnall on the days of easterly operations.

# Altitude Gate Analysis – Easterly Arrivals

The altitude analysis is showing the arrivals. The bar charts in this section show the concentration of the aircraft when aircraft reach the noise monitor in Dagnall. The average altitude of aircraft in this area was 2,764 feet AMSL (2,312 feet AGL).




| Aircraft Type | Number of movements detected | Average Altitude (AMSL in ft) |
|---|---|---|
| A306 | 23 | 2,724 |
| A319 | 434 | 2,750 |
| A320 CEO | 574 | 2,741 |
| A320 NEO (A20N) | 249 | 2,769 |
| A321 CEO | 285 | 2,758 |
| A321 NEO (A21N) | 194 | 2,764 |
| B737-800 NG (B738) | 362 | 2,761 |
| B737 Max 8 (B38M) | 31 | 2,753 |
| Global Express (GLEX) | 104 | 2,800 |
| Cessna 560X (C56X) | 53 | 2,825 |
| Gulfstream G560 (GLF6) | 34 | 2,817 |
| All | 2,921 | 2,764 |

# 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 Dagnall, the noise monitoring terminal collected readings from 2,501 easterly arriving aircraft. During the period, there were 9,151 easterly arrivals.

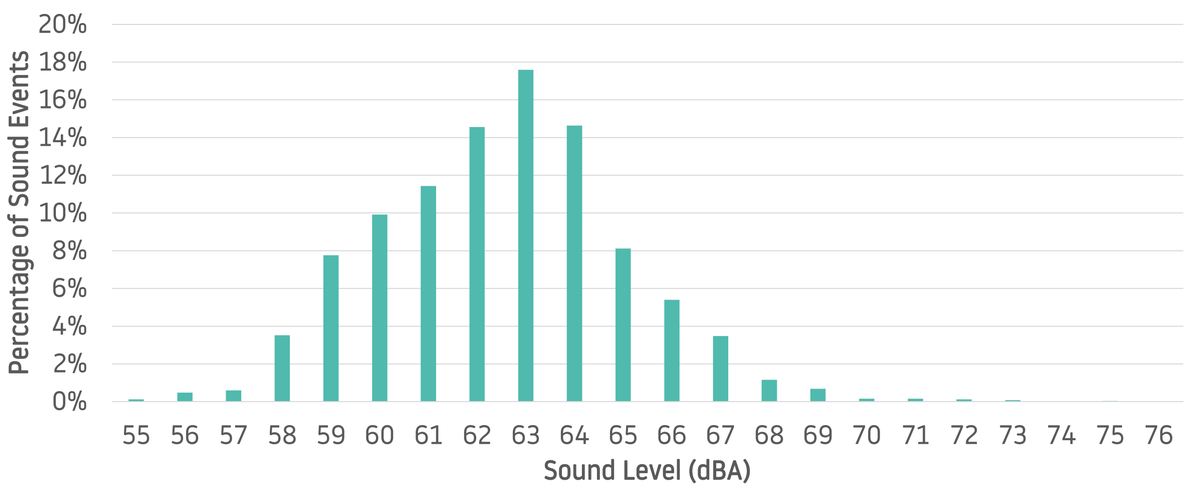
It is noteworthy that the noise monitor may not be able to record every aircraft noise event if the aircraft noise level is below ambient background noise. Therefore, there may be a difference between the number of actual air transport movements and number of aircraft noise events collected during the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

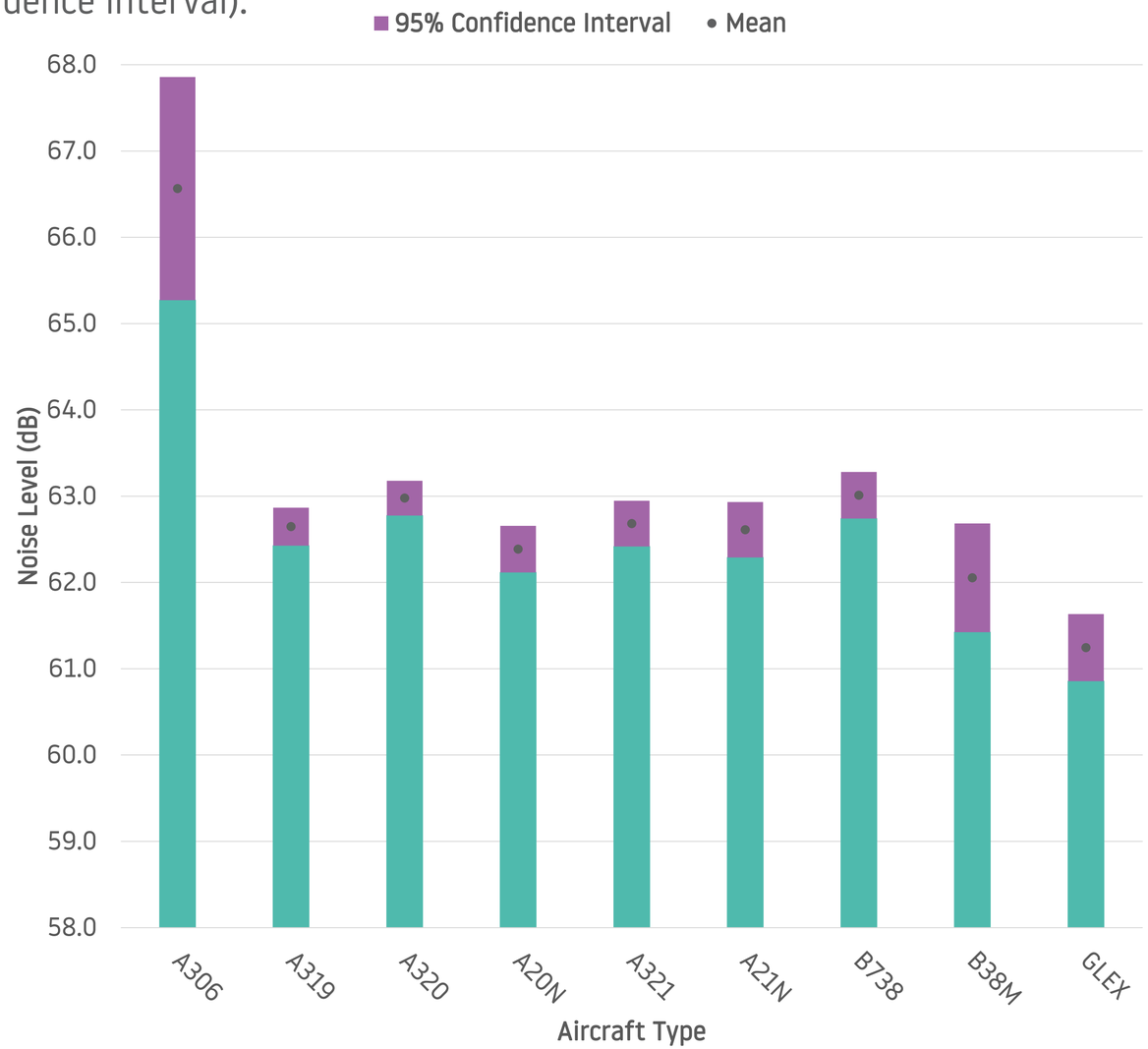
The weather also plays a big part in the data recorded and in periods of extreme weather i.e (very strong winds) the equipment can record noise incorrectly so we exclude samples from the analysis during these weather conditions. When analysing the samples, we ensure that there is no unusual noise event present which might not be caused by aircraft (i.e. vehicles or wildlife). In this analysis, no recording was 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 | 23 | 66.6 |
| A319 | 422 | 62.6 |
| A320 CEO | 553 | 63.0 |
| A320 NEO (A20N) | 239 | 62.4 |
| A321 CEO | 263 | 62.7 |
| A321 NEO (A21N) | 184 | 62.6 |
| B737-800 NG (B738) | 339 | 63.0 |
| B737 Max 8 (B38M) | 28 | 62.1 |
| Global Express (GLEX) | 82 | 61.2 |




*The noise results shown in the analysis are only for those aircraft types that recorded more than 50 events per aircraft (A306 and B737 Max 8 included for comparison).

# Noise Results - Summary

- In Dagnall, residents may experience aircraft noise when the airport is operating in the easterly direction as the arrival aircraft follow the final approach flightpath towards the runway at low altitude.

- The average arrival noise in Dagnall was 62.5dB, based on a sample size of 2,501.

- From the results, Luton's most popular aircraft type by operators, Airbus A320 CEO, had an average noise of 63.0dB.

- The departure noise from the newer generation aircraft, A320 NEO, produced slightly less noise than A320 CEOs, at an average of 0.6dB quieter. The Boeing aircraft fleet, similar to the Airbus A320 family, the new B737 Max 8 was 0.9dB quieter than its predecessor B737-800NG. However, the Max's sample is small. In the sample, 18% of the movements were newer generation aircraft which are more fuel efficient and quieter.

- The freight aircraft A306 was the noisiest aircraft type at Dagnall, at average of 66.6dB. This aircraft type is generally deployed in the daytime period.

# Conclusion

- A mobile noise monitor was installed at a property in Dagnall for two months period.
- For Dagnall, it specifically related to easterly arrivals. During the monitoring period, the airport operated in the direction of easterly and westerly for 31% and 69% of the time respectively. Generally, over the year, LLA operate in the easterly direction for 30-40% 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 arriving aircraft in Dagnall is 2,764 feet above mean sea level (AMSL), and as Dagnall is already approximately 452 feet AMSL, aircraft will typically be at 2,312 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 63.0dB at Dagnall.
- 18% of the noise events recorded in Dagnall were created by the newer generation aircraft, A320 NEO, A321 NEO and B737 Max 8. The A320 NEO registered average noise of 62.4dB, 0.6dB lower than A320 CEOs. More noticeably, the B737 Max 8 was significantly quieter than its predecessor B737-800NG with a difference of 0.9dB. Operators and LLA are in the process of bringing more of these newer generation aircraft fleet into LLA so we will see more share of the more environmentally friendly aircraft in the coming future.
- 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

**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 Dagnall when they line up towards the easterly runway on final approach.

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

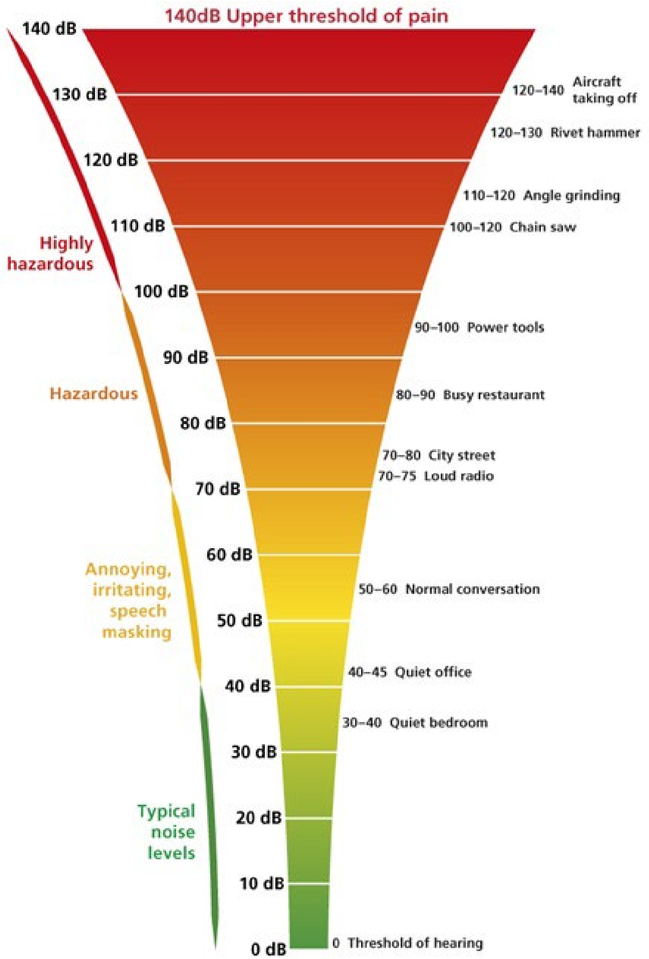
**Altitude Gate Analysis:** A gate which is drawn across an area and will gather flight date about every aircraft passing through the gate area.

**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