# Community Noise Report

## Pepperstock

## February – March 2020

London Luton Airport

Version 1.0

# Introduction

As part of the ongoing noise monitoring programme, London Luton Airport deployed portable noise monitoring terminals in Pepperstock.

The purpose of the monitoring programme is to understand the typical noise levels created in the local community. For Pepperstock, it specifically related to westerly departures. The Standard Instrument Departures (SIDs) or Noise Preferential Routes (NPRs) are shown on the map.

The noise monitor was located at a property at Brickhill Farm Park Homes, close to the westerly departure centerline at an altitude of approximately 568 feet above sea level. The red pinpoint on the map show the location of the noise monitor.

The noise monitor in Pepperstock was in place between 1st February and 29th March 2020.

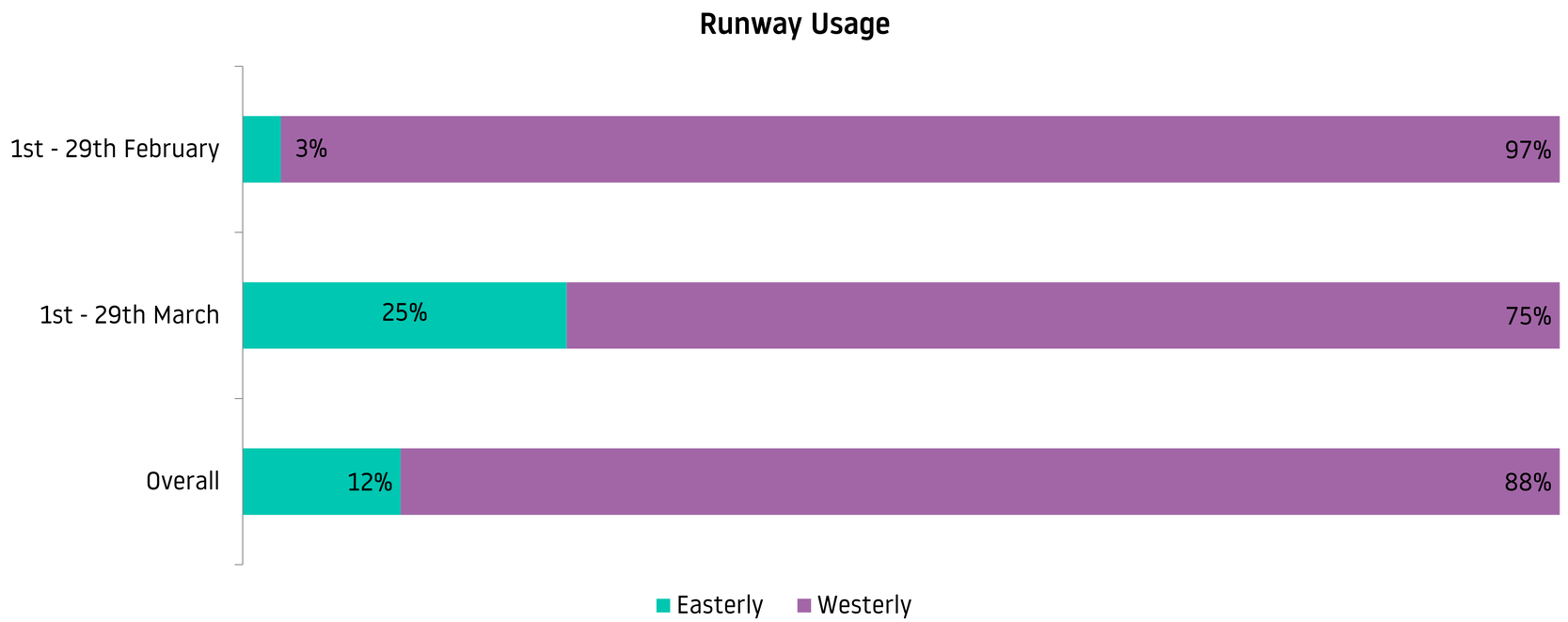
Aircraft noise and tracks recorded were extracted from LLA's noise and track-keeping system. This document evaluates the lateral and vertical positioning of aircraft near the monitor as well as the noise recorded at ground level.

# LLA Operations During the Monitoring

There are two directions of operation, depending on the wind direction as aircraft are required to take off and land into the wind for 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 weather.

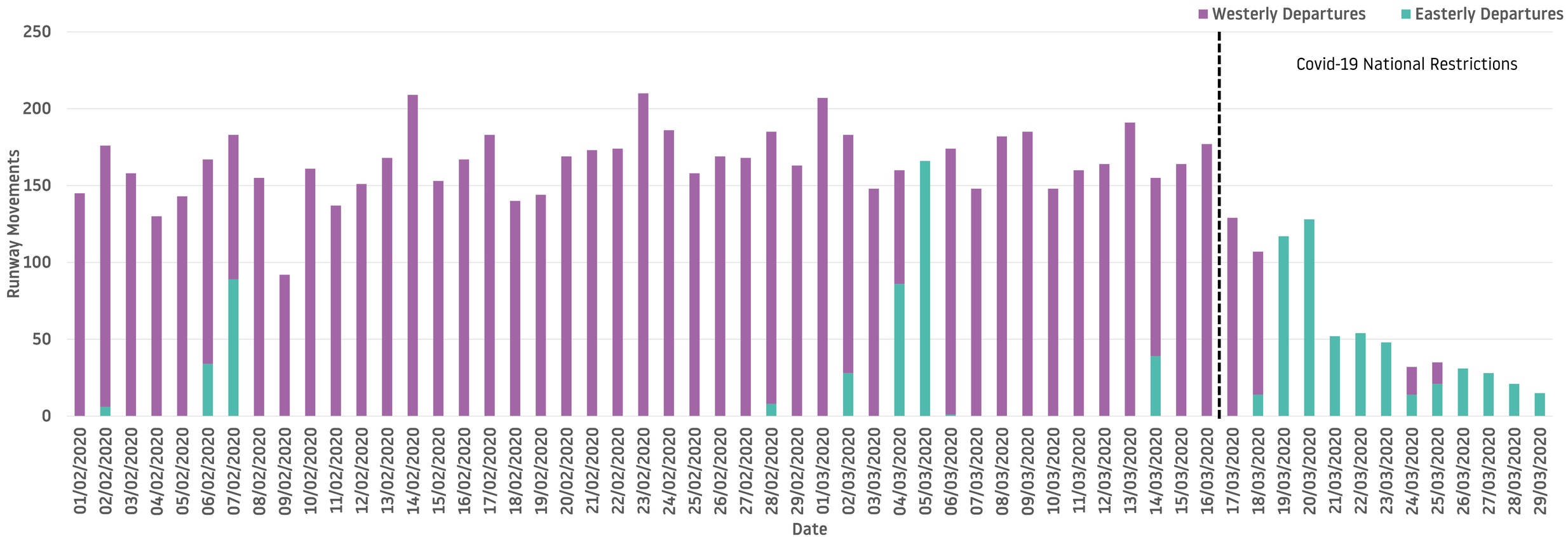
During the monitoring period, the direction of operation was 12% easterly and 88% westerly. The 5 year average for this time of year is 30% easterly vs 70% westerly.

There were 7,224 aircraft using the westerly departure route during the monitoring period.



# Daily Movements During Monitoring Period

The chart below shows the number of daily westerly departures that passed near the noise monitor. Due to the location of Pepperstock, all flights that departed on our Standard Instrument Departure (SID) routes during westerly operations would have flown near the monitor. The busiest day of westerly departures during the monitoring period was the 23rd of February – total departure movements of 210. Residents in the area may experience more frequent aircraft noise on busier days. The aircraft movement dropped significantly after the 16th of March due to the Covid-19 national lockdown restrictions.



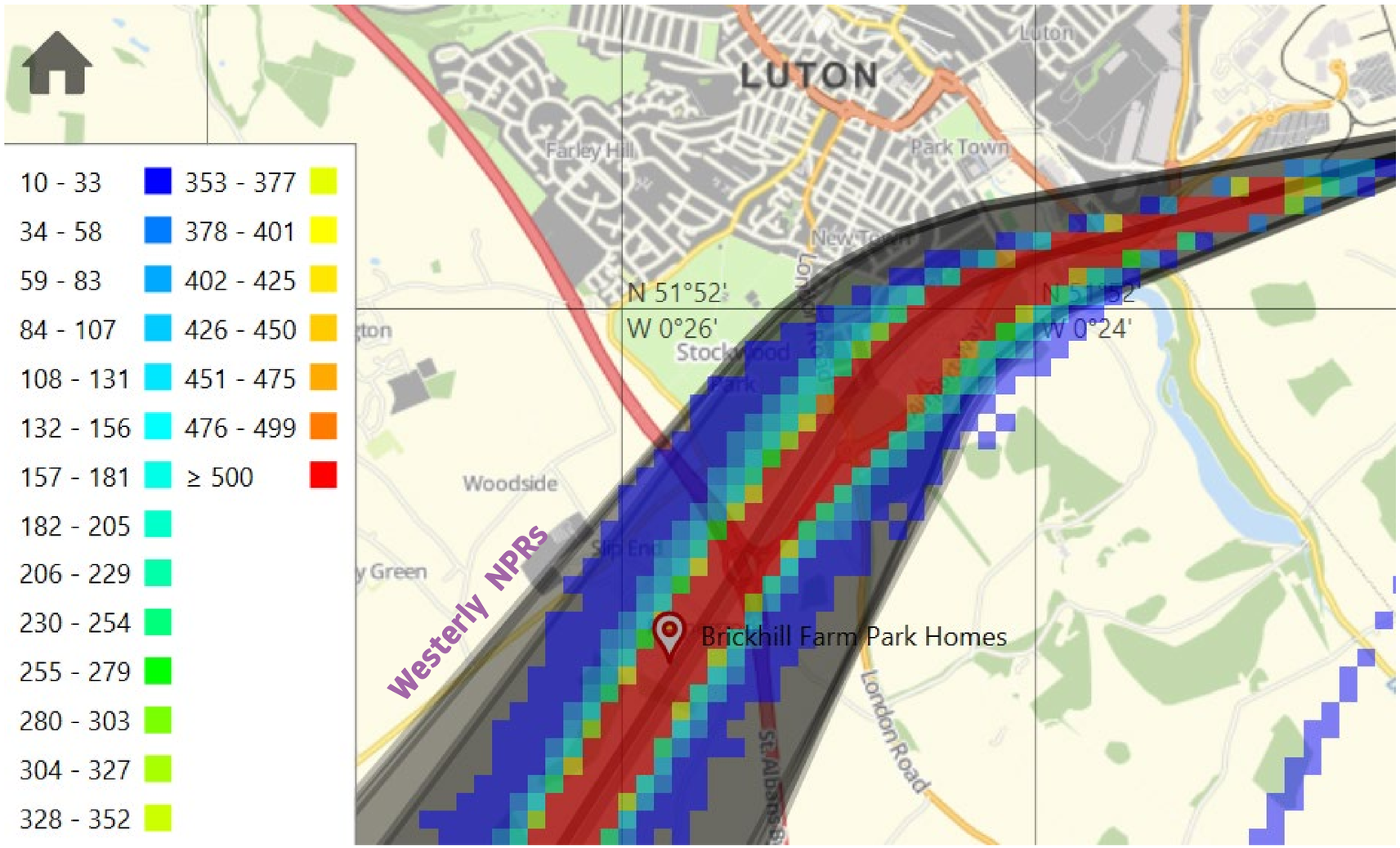
# Operations During the Monitoring Period

The graph below represents the average number of air transport movements during the monitoring period. Depending the operating direction on the day, residents in Pepperstock may experience different flight patterns. During the peak periods, local residents of Pepperstock may notice more aircraft. In general, the morning peak starts at 07:00 and can last for four hours and the afternoon peak starts at 15:00.

During the core night period of 23:30hrs – 06:00hrs in the monitoring period, there was an average of 6 air transport movements, less than previous year but partly due to the national Covid-19 lockdown towards the end of the monitoring period.

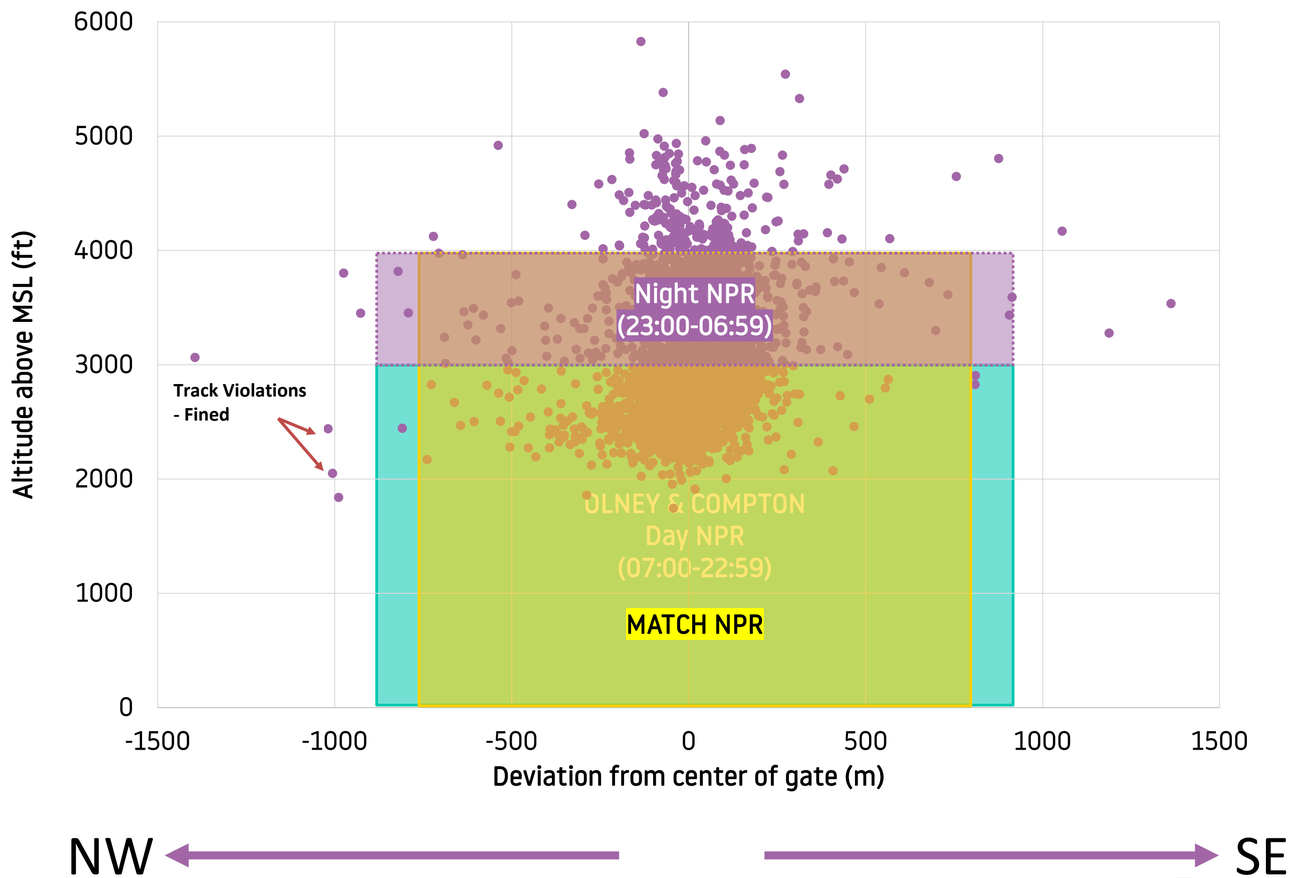
# Aircraft Tracks During the Monitoring Period

The heat maps below show the representative flight tracks that passed near the noise monitor terminals during the monitoring period. The red pinpoints indicate the location of the noise monitor in Pepperstock.



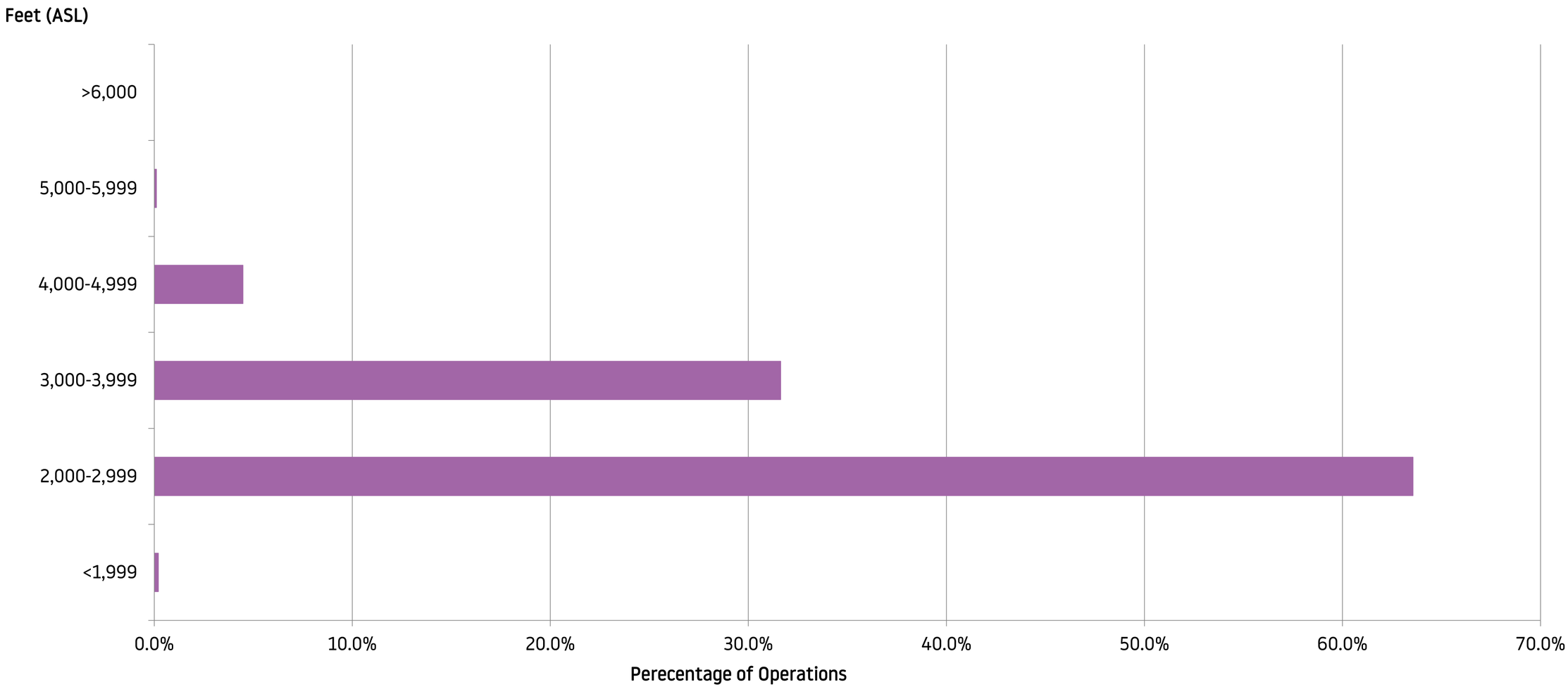
# Altitude Analysis During Monitoring Period

The altitude analysis for Pepperstock 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 across perpendicular to the NPRs from north-west to south-east and will gather information on 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. The largest noise preferential routes (NPRs) are displayed by the shaded area. Departing aircraft must remain within this NPR until reaching release altitude of 3,000ft during the day or 4,000ft at night. It should be noted that the Match departure route is only 2km wide.

# Altitude Analysis During Monitoring Period

The bar charts show the spread of the altitude when aircraft reach the noise monitor in Pepperstock. The average altitude of aircraft in this area was 2,971 feet above sea level (ASL) (2,403 feet above ground level [AGL]). The majority of the departing flights were above 2,000 feet ASL.



# 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. 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).

During the monitoring period in Pepperstock, the noise monitoring terminal collected readings from 4,207 departing aircraft. During the period, there were total of 7,224 westerly departures.

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.

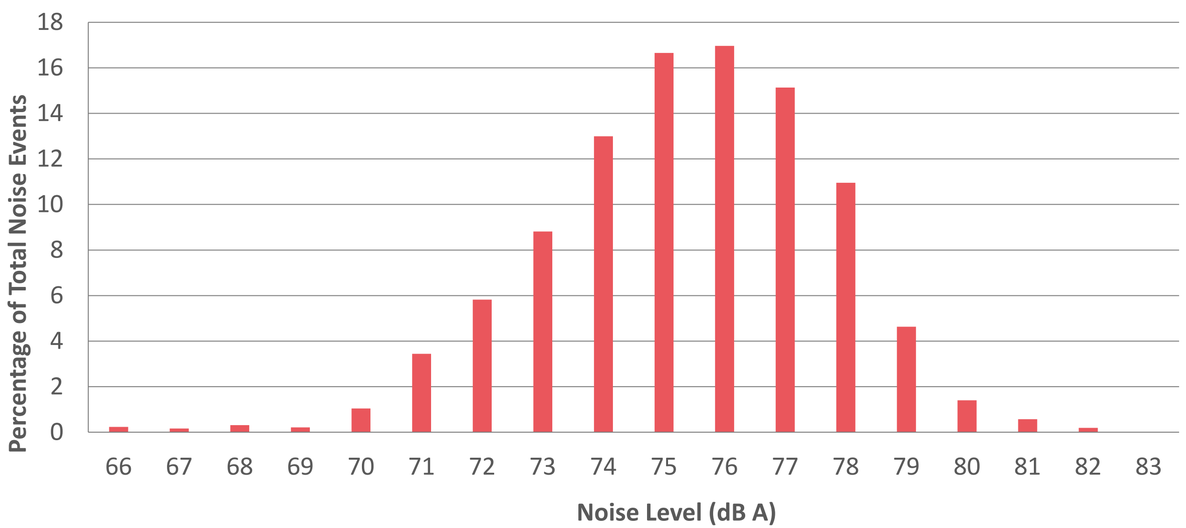
The weather also plays a big part in the data recorded and in periods of extreme weather i.e (very strong winds) the equipment can record noise incorrectly so we exclude samples from the analysis during these weather conditions. During the monitoring period, no recordings need to be excluded from the analysis for weather reason.

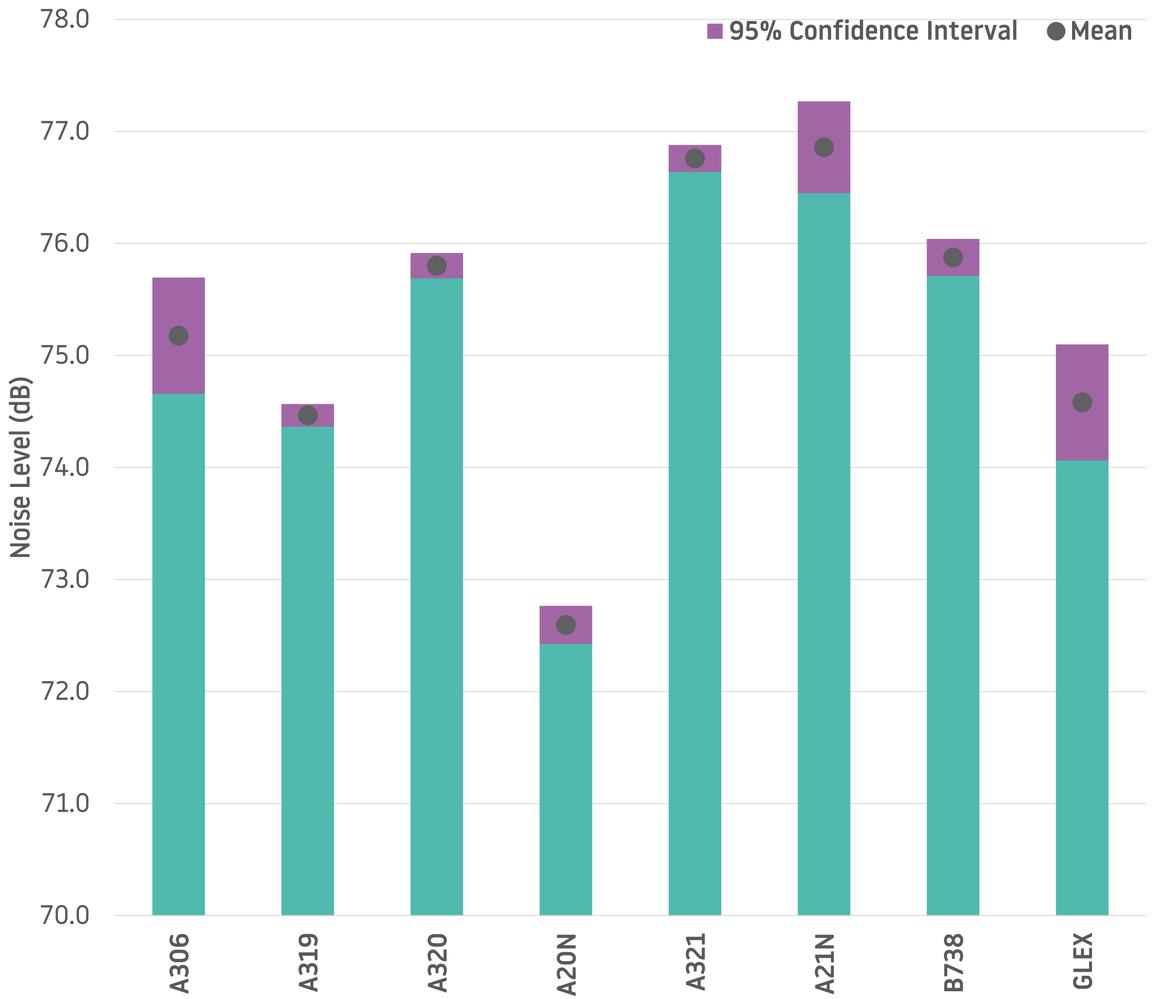
The purpose of the monitoring programme is to understand the typical noise levels created in the local community. For Pepperstock, it specifically related to westerly departures.

# Departures - Noise Results During Monitoring Period

During the monitoring period, noise recording samples were gathered from the most popular aircraft types at London Luton Airport*. The summary of the results on departing aircraft noise are shown on this page.

| Aircraft Type | Number of movements | Average Noise (dB) |
|---|---|---|
| A306 | 71 | 75.2 |
| A319 | 772 | 74.5 |
| A320 CEO | 1,201 | 75.8 |
| A20N (A320 NEO) | 254 | 72.6 |
| A321 CEO | 783 | 76.8 |
| A21N (A321 NEO) | 106 | 76.9 |
| B738 | 545 | 75.9 |
| GLEX | 141 | 74.6 |




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

# Departures - Noise Results During Monitoring Period

- The average departure noise in Pepperstock is 75.3dB, based on a sample size of 4,207.
- The table shows the average noise for each aircraft type and the purple bar on the chart shows the uncertainty caused by the spread in readings and the sample size (95% confidence interval).
- From the results, LLA's most popular aircraft, Airbus A320 CEO, has an average noise of 75.8dB in Pepperstock.
- The departure noise from the newer generation of the same type, A320 NEO, was significantly quieter than other large commercial jets.
- The data showed that the A321 NEO were 0.1dB nosier than the A321 CEO, this is unlikely to be audible to the human ear. Nevertheless, this is thought to be due to the heavier take off weight on the route which utilised the A321 NEO aircraft during the monitoring period, this is still under investigation with the operator. Furthermore, there was large difference in the sample size of the A321 CEO and A321 NEO, recording 783 and 106 samples respectively.

# Conclusion

- For Pepperstock, it specifically related to westerly departures. During the monitoring period, the airport was using westerly operations for 88% of the time, this is more than the five year average of this time period.

- The average altitude of departing aircraft in Pepperstock is 2,971 feet above sea level (ASL), and as Pepperstock is already approximately 568 feet ASL, aircraft will typically be 2,403 feet above ground level (AGL) in this area.

- Most aircraft shown in the altitude analysis flew within or above the NPR corridor. Some aircraft were fined under the airport's track violation scheme.

- The main aircraft type operating at London Luton Airport is the Airbus A320 CEO which produced an average noise of 75.8dB in Pepperstock. 8.6% of the noise events recorded in Pepperstock were created by the newer generation aircraft, A320 NEO and A321 NEO, registering average departing noise events of 72.6dB and 76.9dB respectively.

- The data showed that the A321 NEO were 0.1dB nosier than the A321 CEO, this is unlikely to be audible to the human ear. Nevertheless, this is thought to be due to the heavier take off weight on the route which utilised the A321 NEO aircraft this is still under investigation with the operator. Furthermore, there was large difference in the sample size of the A321 CEO and A321 NEO, recording 783 and 106 samples respectively. LLA will continue to investigate into this further as we collect more A321 NEO's departing noise events from the fixed noise monitors located at Grove Farm near Slip End and Pepsal End Farm in Pepperstock.

- In general, westerly operation operates for approximately 70% of the time yearly due to the prevailing wind. On a day of easterly operation which operate in the remaining approx. 30% of the time, Pepperstock residents may not notice any Luton departing aircraft.

- In Q1 2020, 53 aircraft (both westerly and easterly) were investigated as part of the Noise and Track violation scheme. Two 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

- We are looking at new ways to make our community noise reports easier for the local communities to understand as well as including the right information. If you have any suggestions about how we can make these reports better, please don't hesitate to let us know by emailing noise.enquiries@ltn.aero.

# 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 Pepperstock.

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

**Noise Preferential Route:** 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.

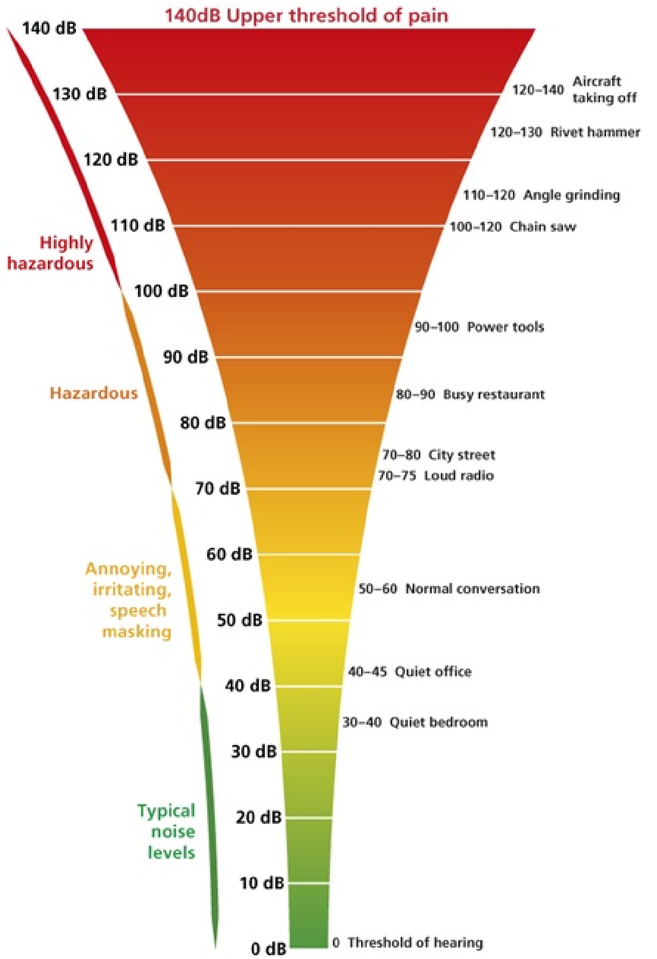
**Gate Analysis:** A gate which is drawn across an area and will gather information about every aircraft passing through the gate area.

**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