Community Noise Report

Croydon

October – December 2023

London Luton Airport

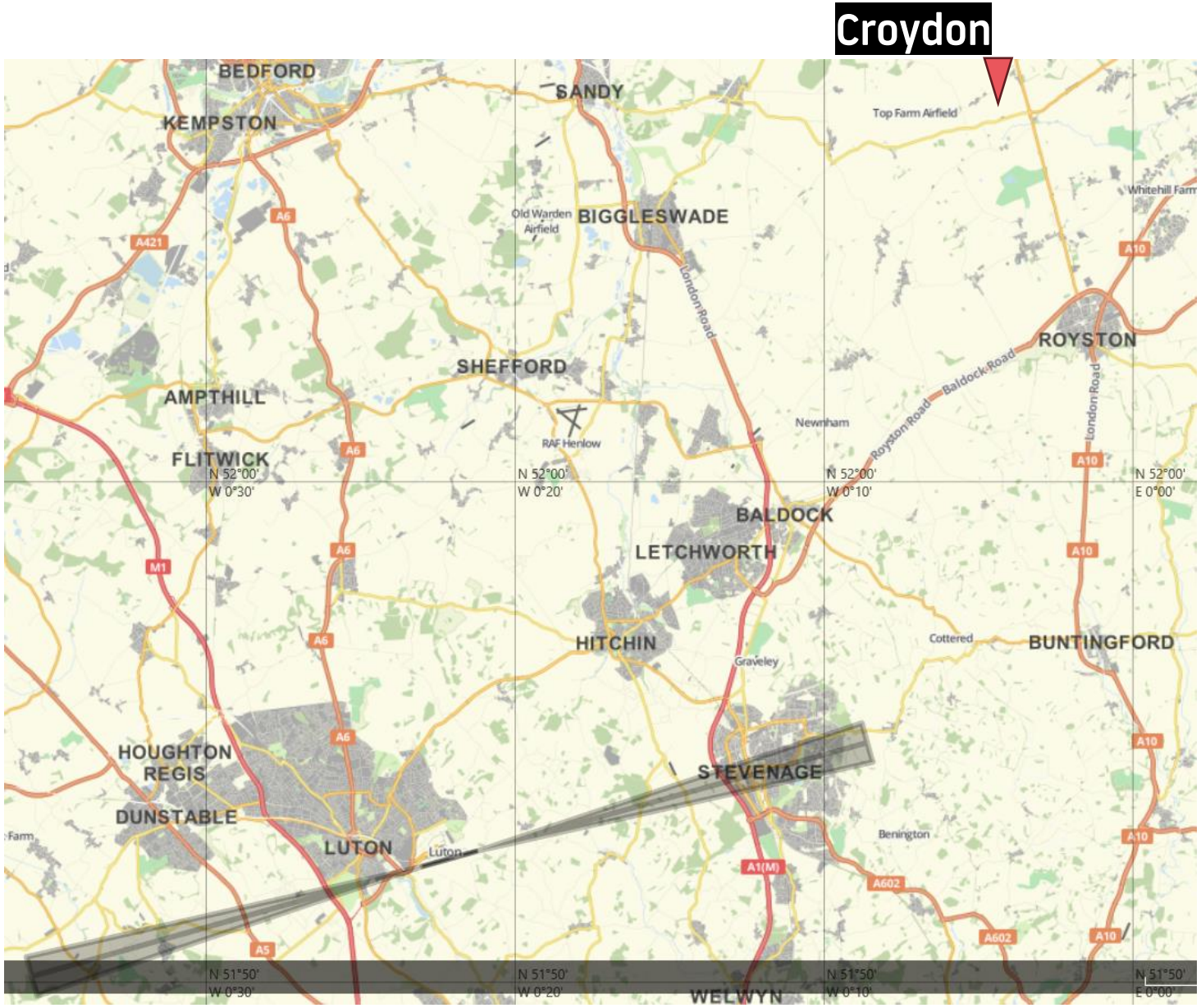
Introduction

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

The purpose of the monitoring programme is to understand the typical noise levels created in the local community. **For Croydon it specifically related to easterly and westerly arrivals. The final approach flightpath are shown on the map.** The noise monitor was located at a residential property on Main road, approximately central of the easterly arrival centreline at an altitude of 161 feet above sea level. The red pinpoint on the map shows the noise monitor location.

The noise monitor in Croydon was in place between the 9th October 2023 and 4th December 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.

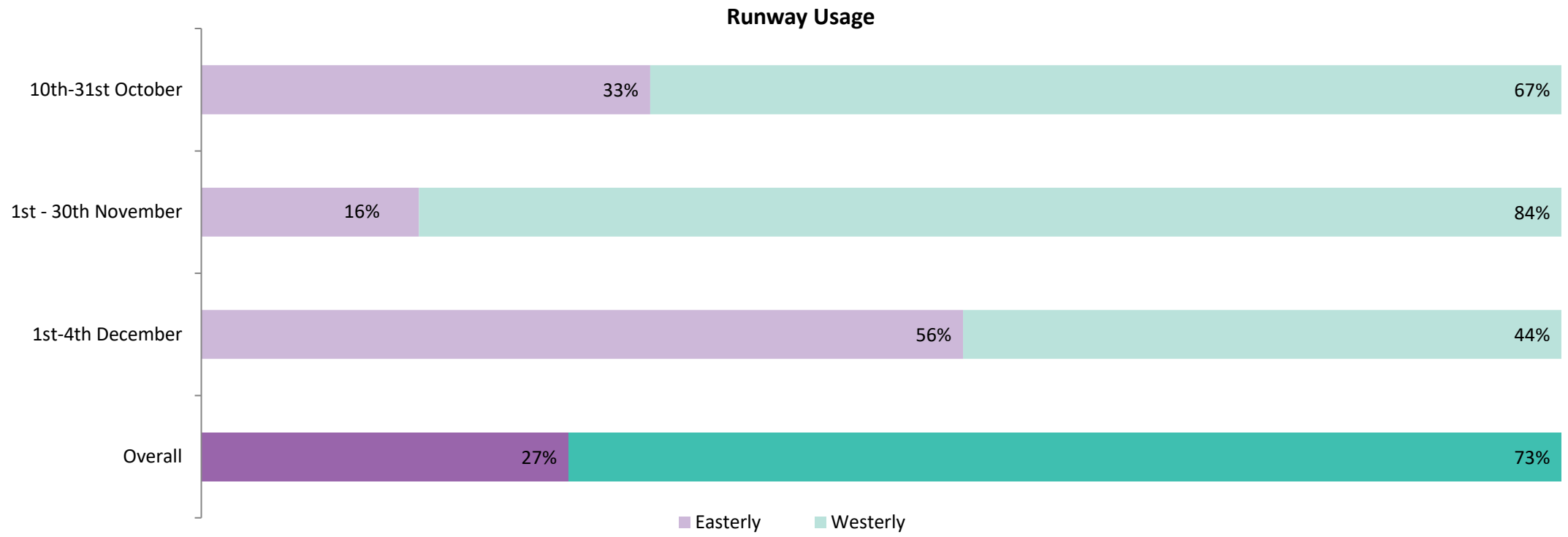


LLA operations during the monitoring period

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.

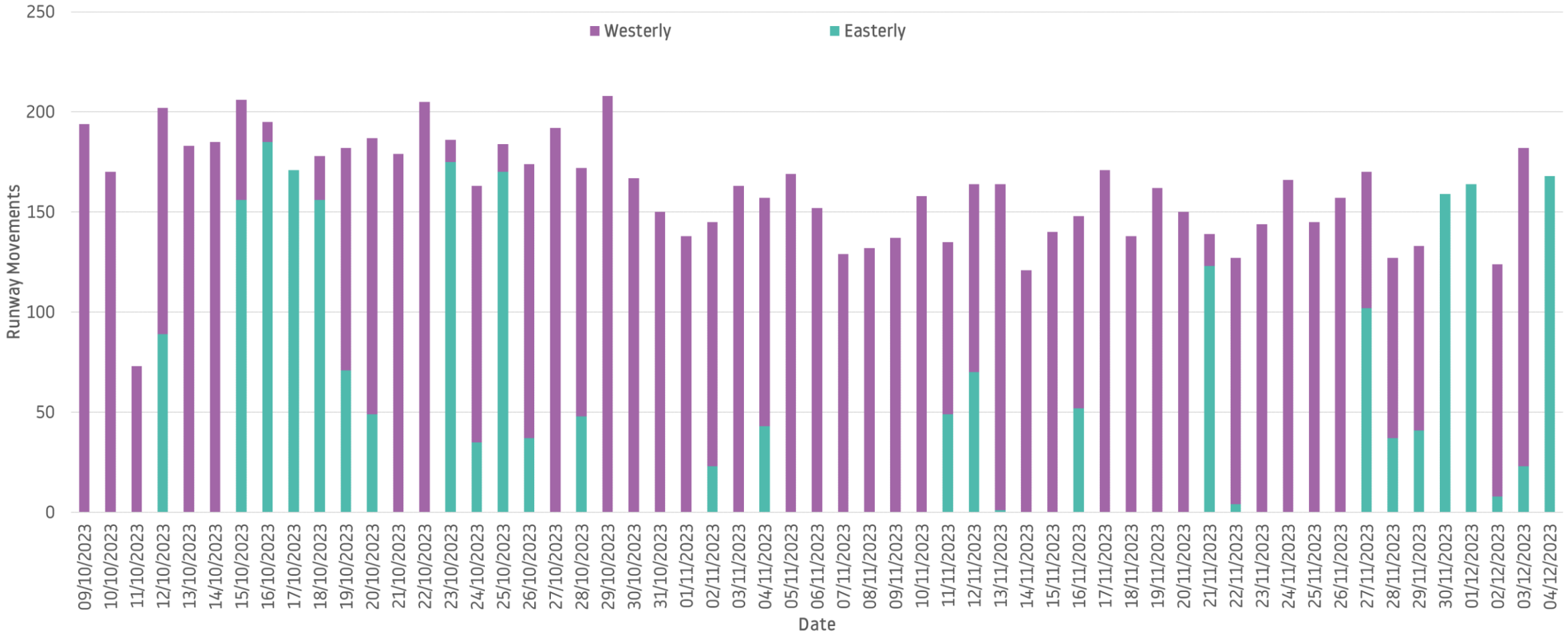
During the period of monitoring, the direction of operation was 27% Easterly and 73% Westerly. The 5-year average for this time of year is 20% easterly vs 80% westerly.

There were 2,741 aircraft arriving on the easterly route in Q4 2023 and 11,967 on arrivals on the westerly route.



Daily Movements during monitoring period

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

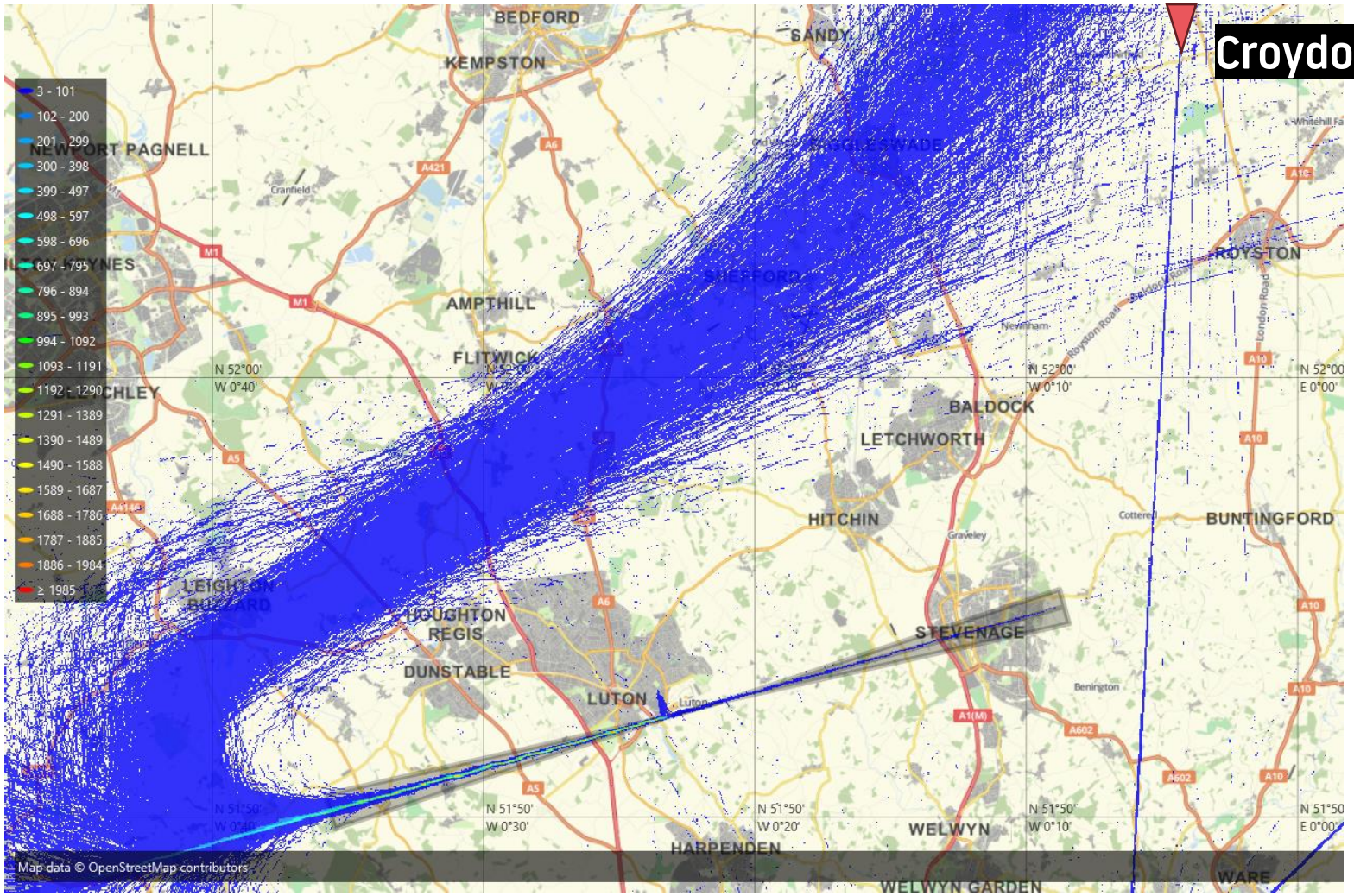


Operations during monitoring period

The graph below represents the average aircraft movement by hours during the monitoring period. Depending on the operating direction on the day, residents in Croydon may experience different flight patterns. During the peak periods, residents of Croydon may notice more frequent aircraft movements. In general, the morning peak starts at 6am on the days of arrival operations and these aircraft would be lower at altitude and more noticeable as the dwellings at this location are just next to the aircraft approach flightpath travelling south to the airport. During the night period of 23:00 – 06:00 in the monitoring period, there were an average of 6 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 Croydon. This map shows the path of easterly arrivals.



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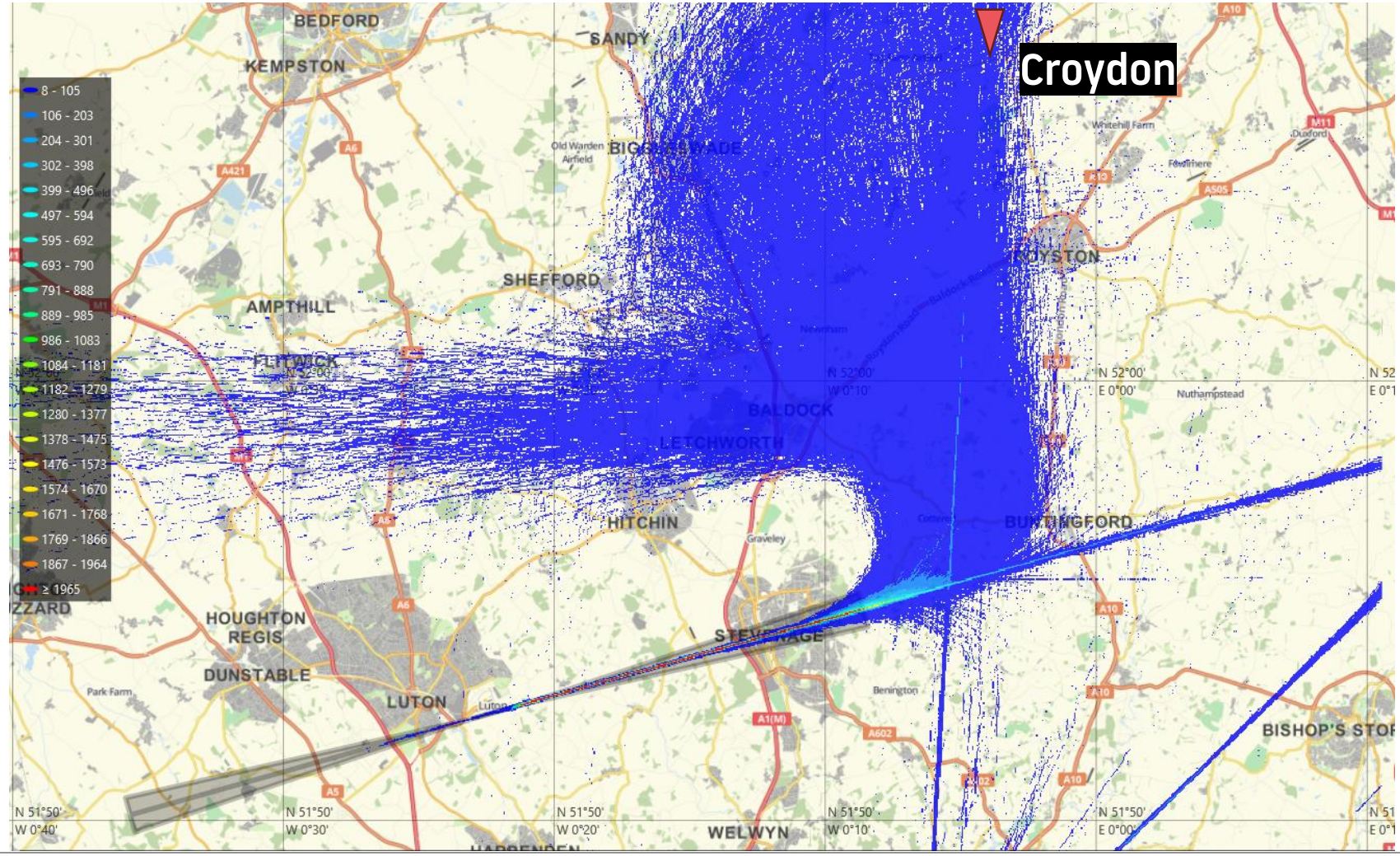
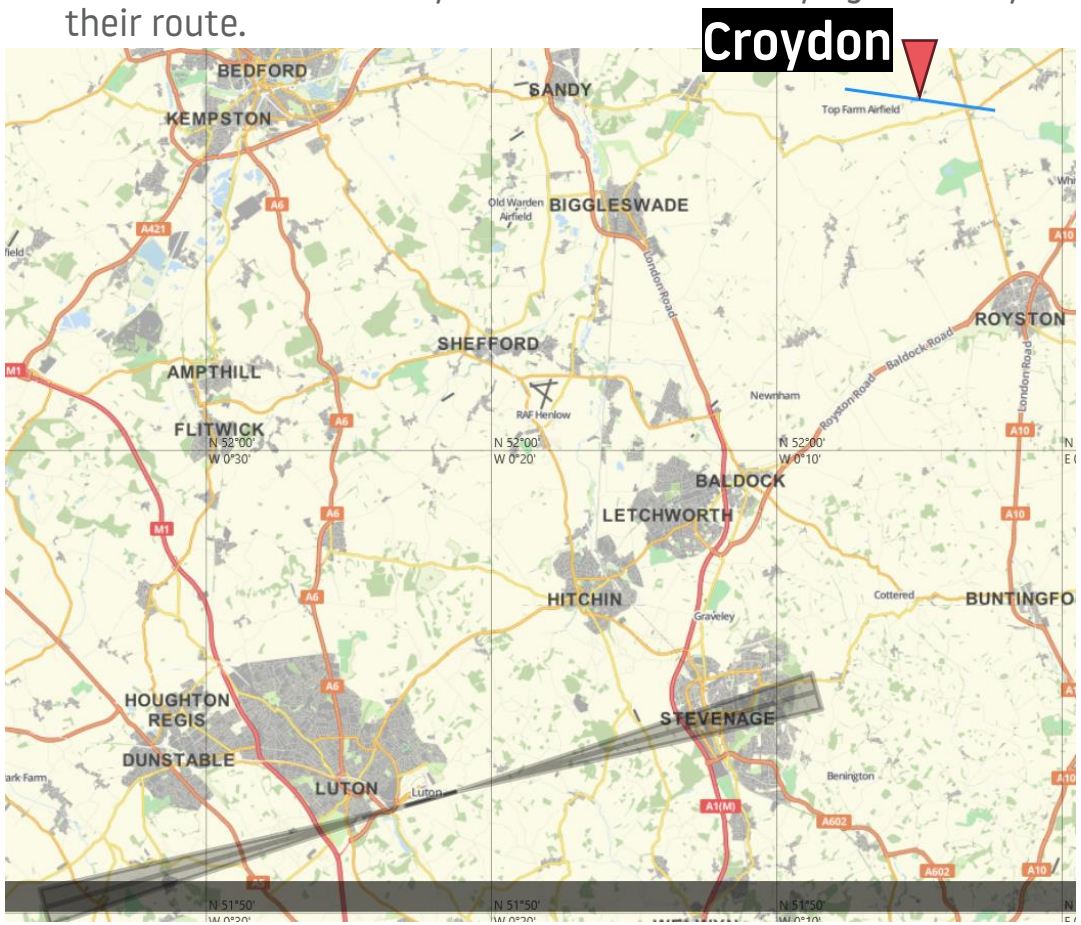
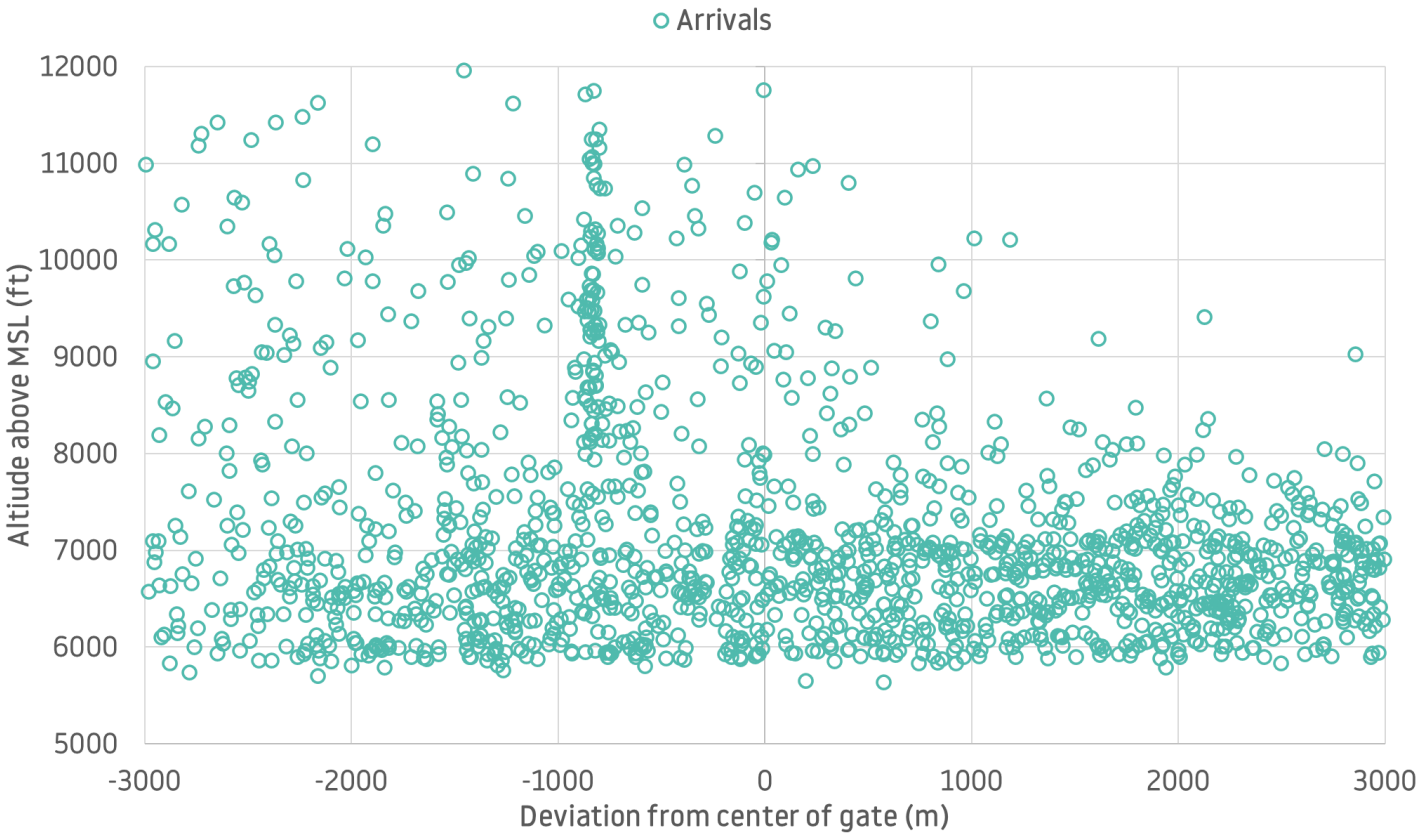


Altitude Gate Analysis

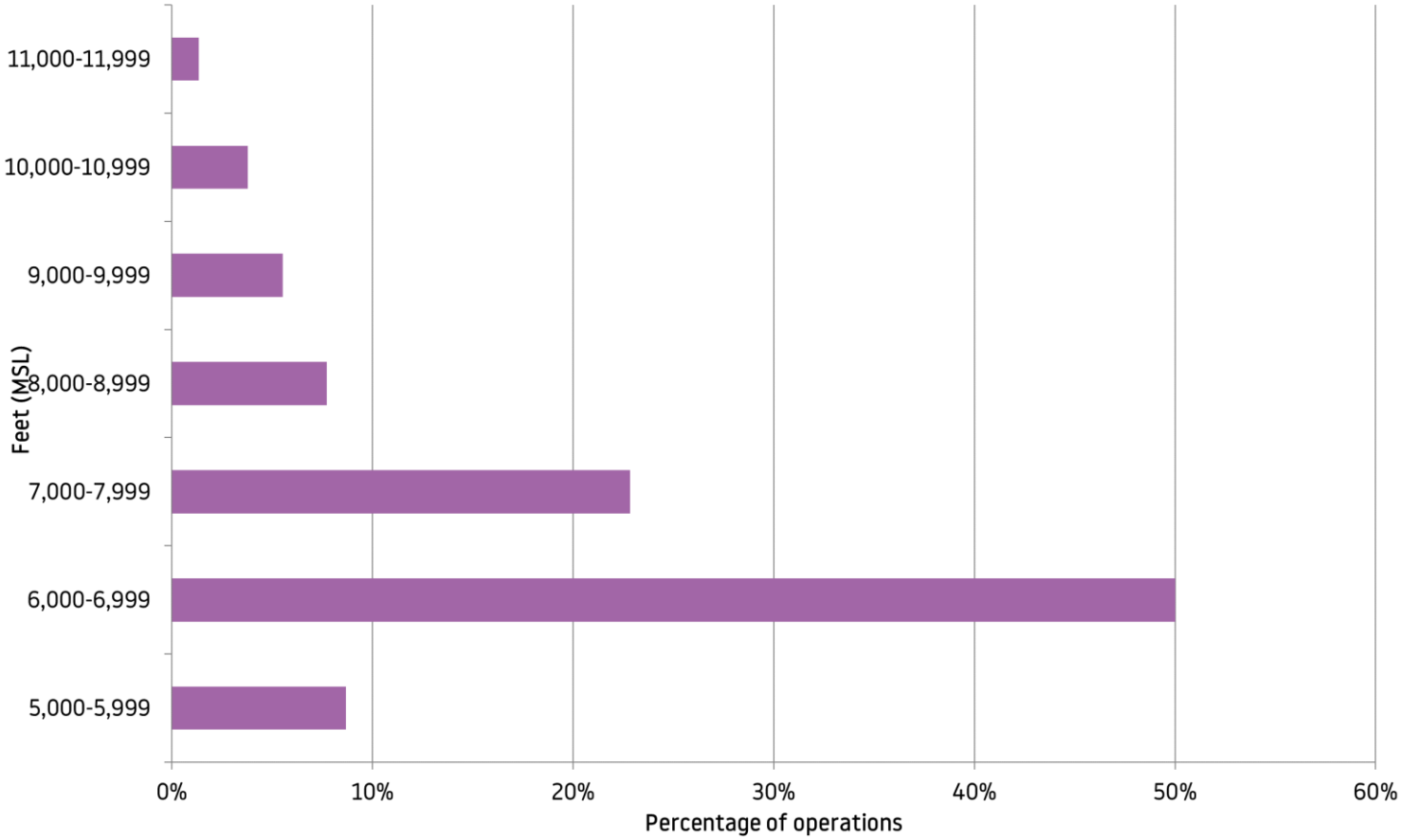
The altitude analysis for Croydon, shows the vertical and lateral dispersion of aircraft 3km either side of the noise monitor. The map below shows the 6km gate (blue line, top right of picture) which is drawn perpendicular to the NPR from northwest to southeast and it gathered information of every aircraft 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 Croydon will see aircraft flying over Croydon on the days of easterly and westerly operations for arrival aircraft depending on their route.





Altitude Gate Analysis – Arrivals

The average altitude of aircraft was 7,261 feet AMSL (7,100 feet AGL) when they reach above the noise monitor above Croydon. 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	7	6,829
A319	159	7,428
A320 CEO	267	7,167
A320 NEO (A20N)	160	7,323
A321 CEO	178	6,842
A321 NEO (A21N)	326	6,748
B737-800 NG (B738)	88	7,439
B737 Max 8 (B38M)	82	7,649
Global Express (GLEX)	36	7,924
Cessna 560X (C56X)	31	7,261
All	1,334	7,261

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 Croydon, the noise monitoring terminal collected 729 readings. During the period, there were 2,409 easterly arrivals and 6,775 westerly arrivals.

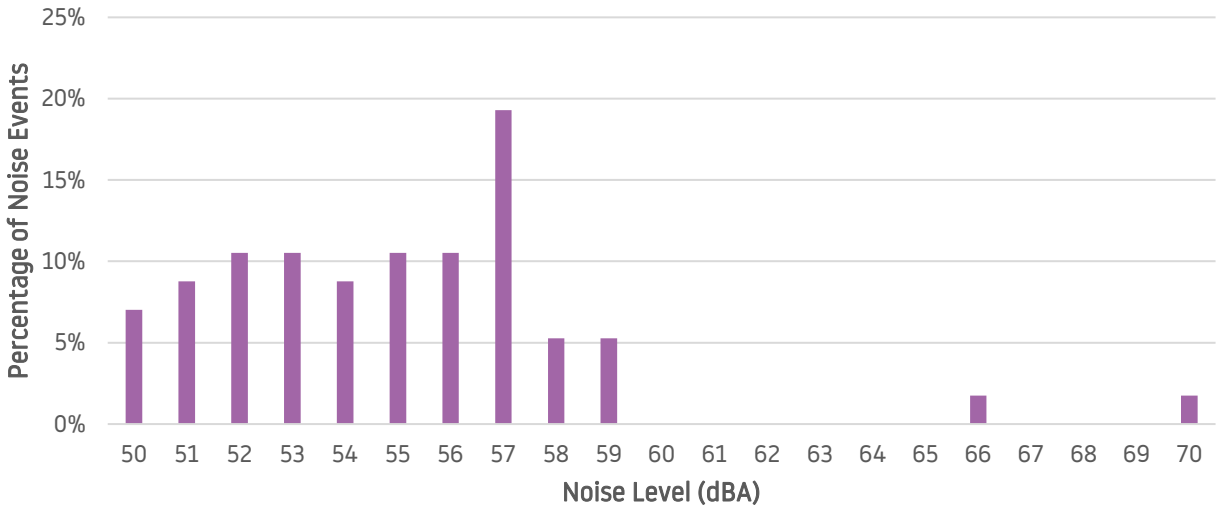
It is noteworthy that the noise monitor may not be able to record every aircraft noise event if the aircraft noise level is below ambient background noise or aircraft following a different route and not through the gate selected. Therefore, there may be a difference between the number of actual air transport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

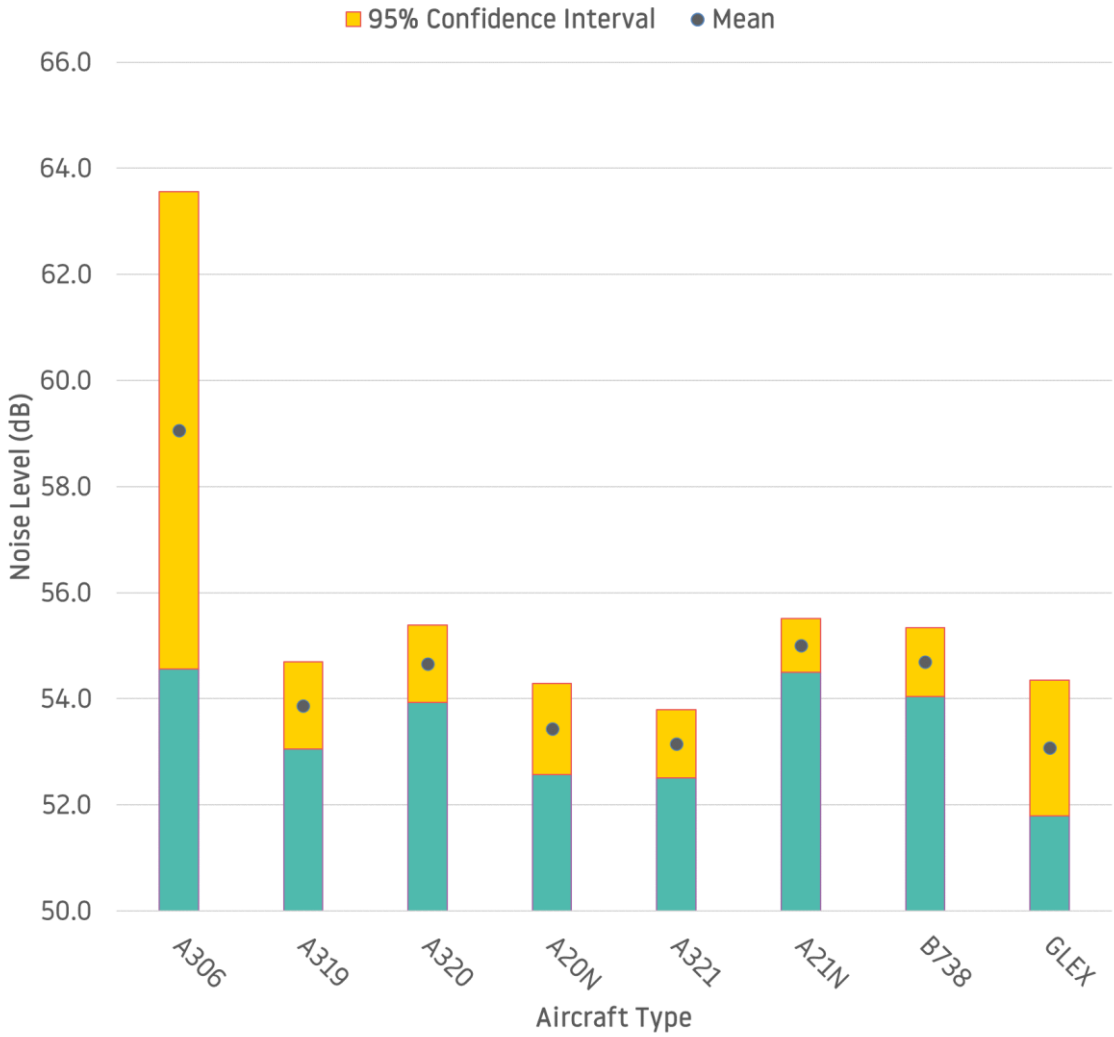
The weather also plays a big part in the data recorded and in periods of extreme weather i.e (very strong winds) the equipment can record noise incorrectly, so we exclude samples from the analysis during these weather conditions. When analysing the samples, the first thing we do is to ensure that there is no unusual noise event present which might not be caused by aircraft (i.e. vehicles or wildlife). A total of 4,946 recordings were excluded from the analysis for the above reasons.

Noise Results – 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	5	59.1
A319	54	53.9
A320 CEO	110	54.7
A320 NEO (A20N)	58	53.4
A321 CEO	78	54.7
A321 NEO (A21N)	176	55.0
B737-800 NG (B738)	48	54.7
B737 Max 8 (B38M)	33	54.0
All	562	54.9





*The noise results shown in the analysis are only for those aircraft types that recorded more than 30 events per aircraft (A306 and B737 Max 8 included for comparison).

Noise Results - Summary

- The average arrival noise in Croydon was 54.9dB, based on a sample size of 562.
- From the results, Croydon's most popular aircraft type by operators, Airbus A321 NEO, had an average noise of 55.0dB (arrival).
- The noise from the newer generation aircraft, A320 NEO, produced less noise than A320 CEOs, at an average of 1.3dB quieter. Around 48% of all noise results movements were newer generation aircraft which are more fuel efficient and quieter.

Conclusion

- A mobile noise monitor was installed at a residential property in Croydon on High street, from the 9th October to 4th December 2023.
- For Croydon, it specifically related to arrivals. During the monitoring period, the airport operated in the direction of easterly and westerly for 27% and 73% of the time, respectively. Generally, over the year, LLA operate in the westerly direction for 70% and easterly 30% of the time due to the prevailing wind.
- The main aircraft type operating at London Luton Airport is the Airbus A321 NEO which produced an average noise of 55.0dB for arrivals.
- 48% of the noise events recorded in Croydon were created by the newer generation aircraft, A320 NEO, A321 NEO and B737 Max 8. The A320 NEO registered average departing noise of 53.4dB, 1.3dB lower than A320 CEOs.
- During the monitoring period, 41 aircraft were investigated as part of the Noise and Track violation scheme. Of these, 17 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.