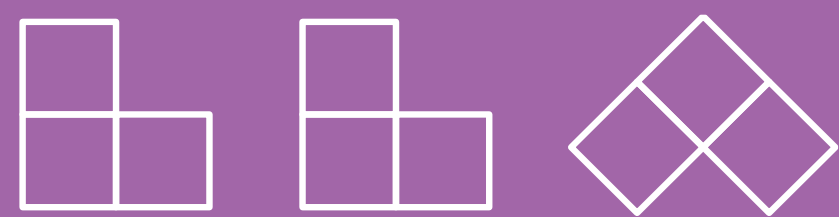


Community Noise Report

Redbourn

June – September 2022



London Luton Airport

Introduction

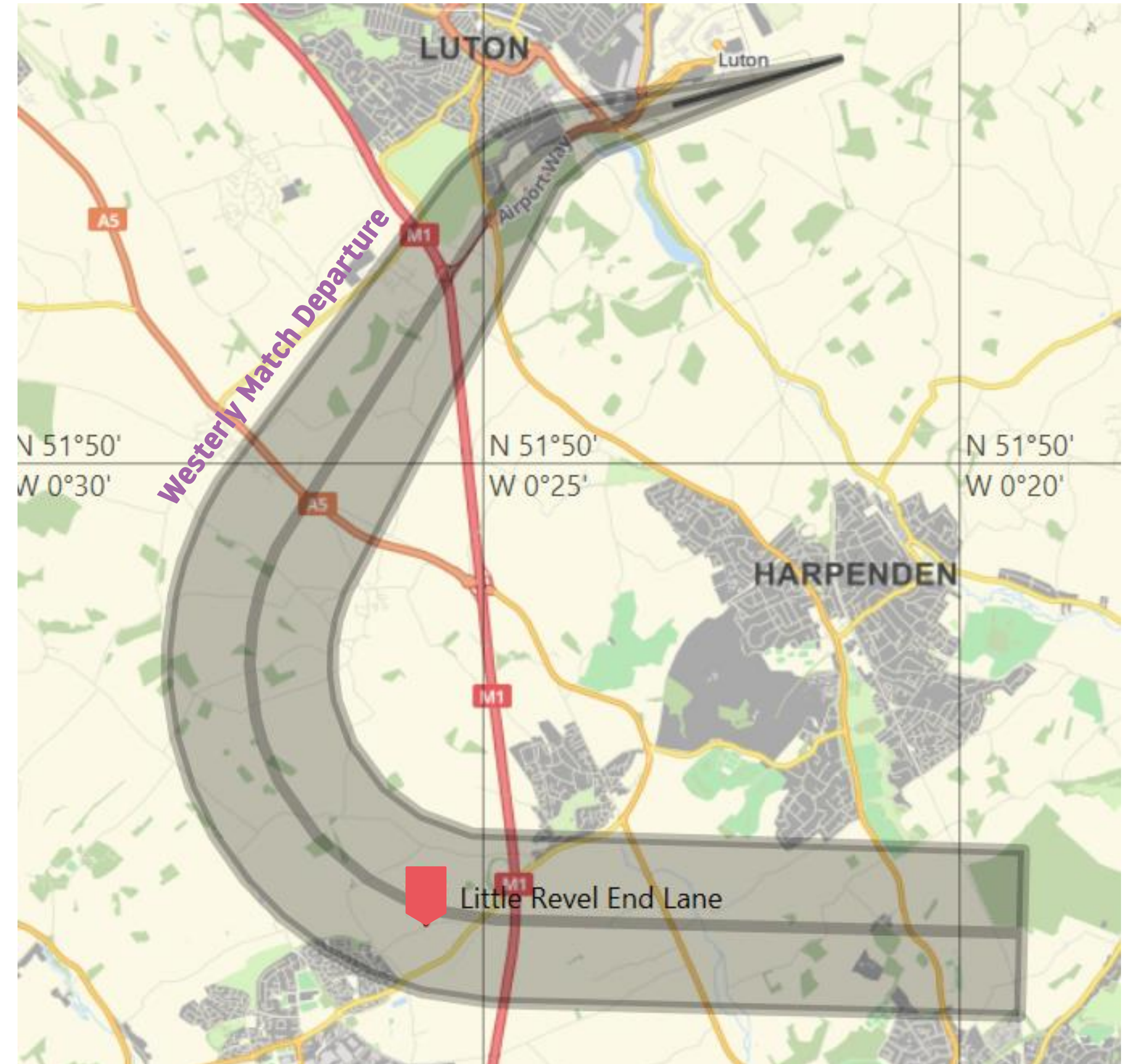
As part of the ongoing noise monitoring programme and the NADP trial*, London Luton Airport deployed a portable noise monitoring terminal in Redbourn.

The purpose of the monitoring programme is to understand the typical noise levels created in the local community. For Redbourn, it specifically related to the westerly Match departure. The Noise Preferential Route (NPR) is shown on the map.

The noise monitor was located at a property on Little Revel End Lane, close to the centreline of the westerly Match departure corridor, at an altitude of approximately 390 feet above sea level. The red pinpoint on the map shows the location of the noise monitor.

The noise monitor in Redbourn was in place between 28th June and 24th September 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.

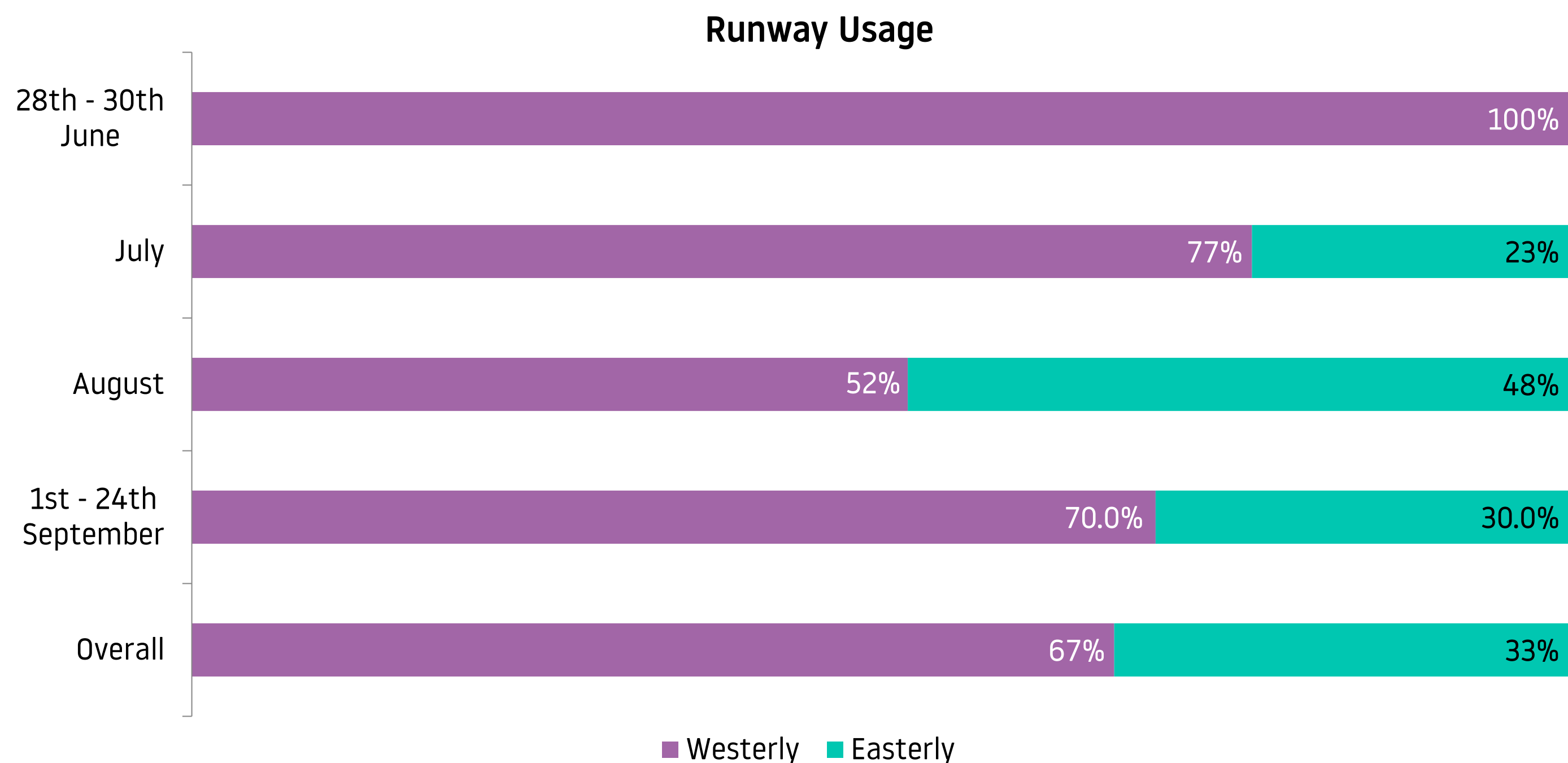


LLA Operations

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.

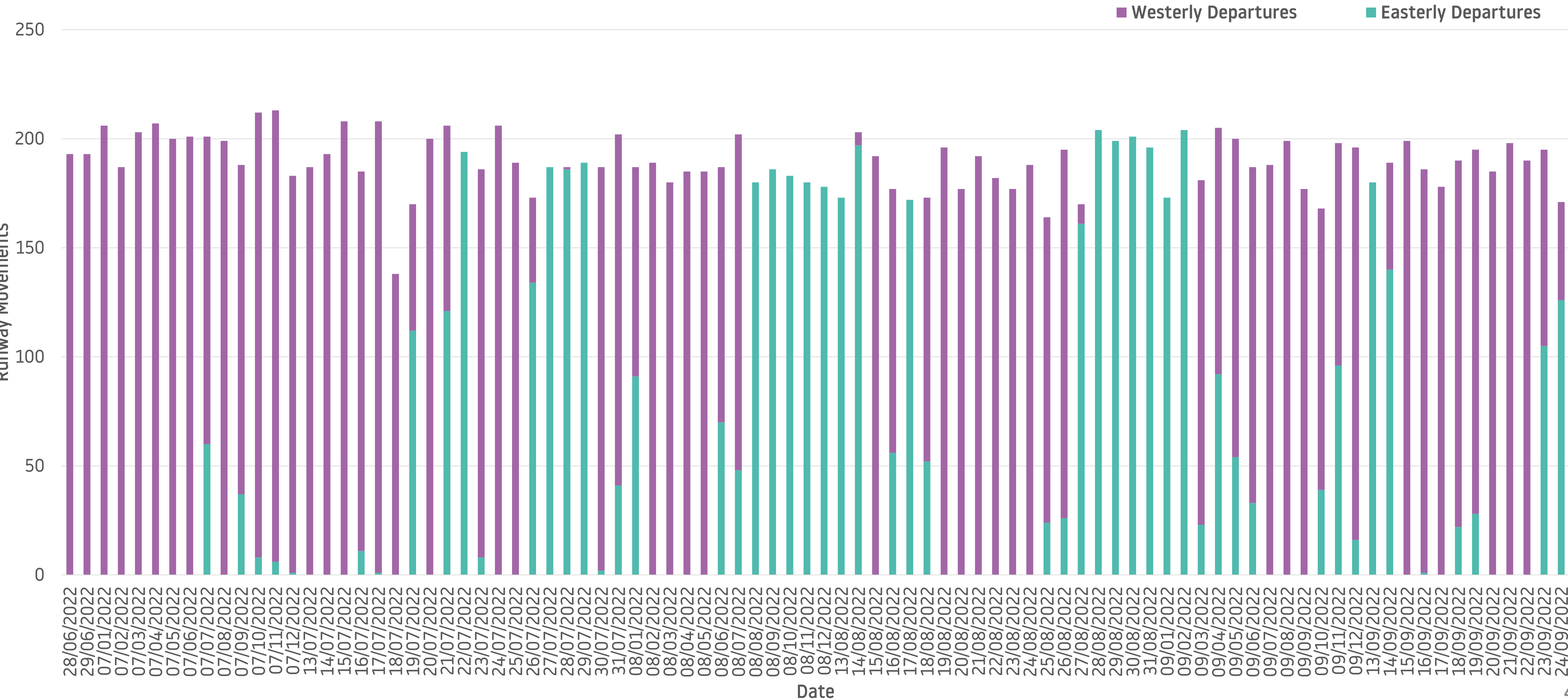
During the monitoring period, the direction of operation was 67% westerly and 33% easterly. The 5-year average for this time of the year is 70% westerly vs 30% easterly.

There were 6,710 aircraft which departed on the westerly Match route whilst the noise monitor was located in Redbourn. In terms of total air transport movements, LLA was operating at 88% of pre-pandemic level.



Daily Movement

The chart below shows the number of daily westerly and easterly departures at LLA. Due to the location of Redbourn, some flights that departed on our westerly Match route would have flown near the monitor. Therefore, aircraft noise may be noticeable in westerly operation.



Operations During the Monitoring Period

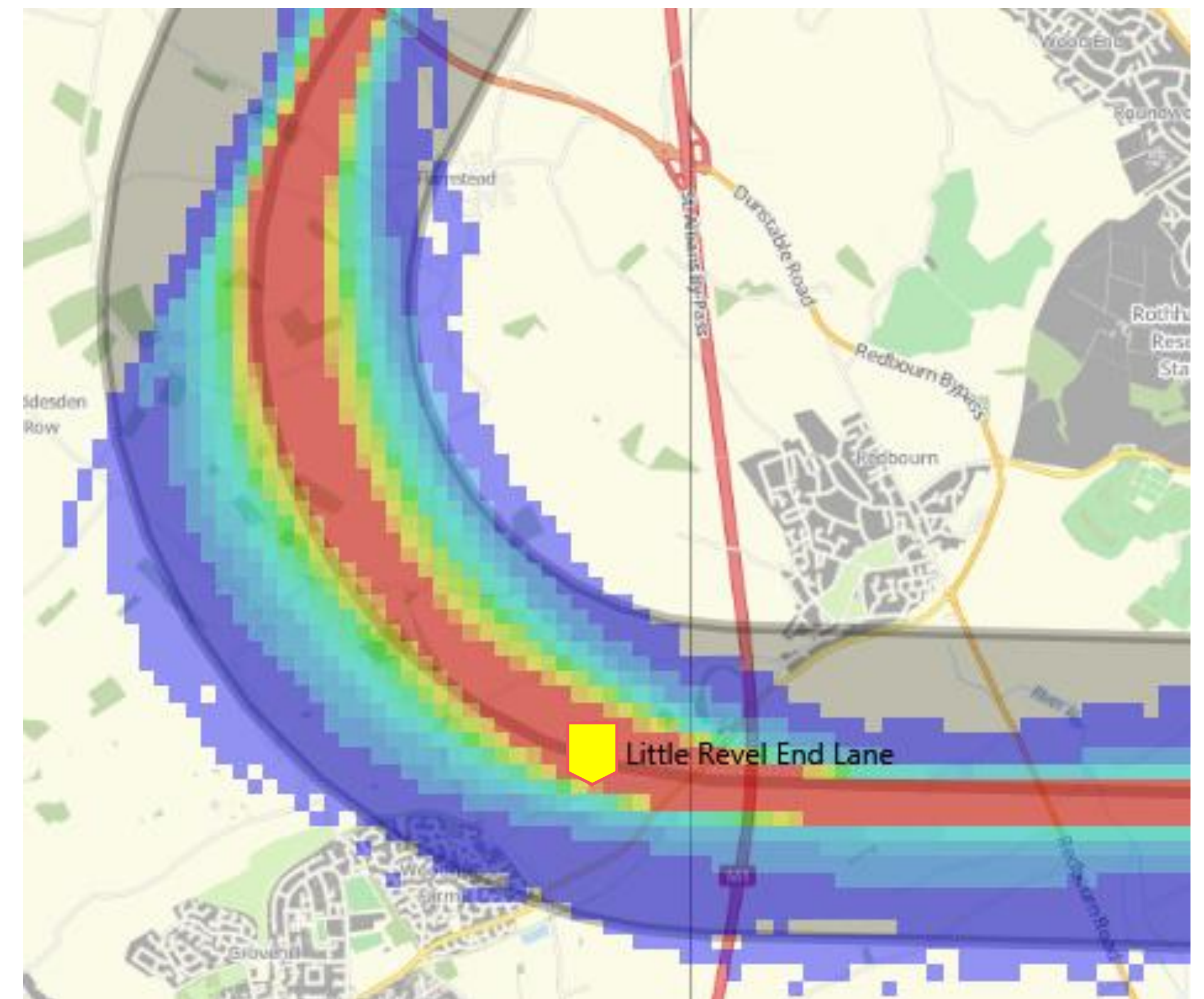
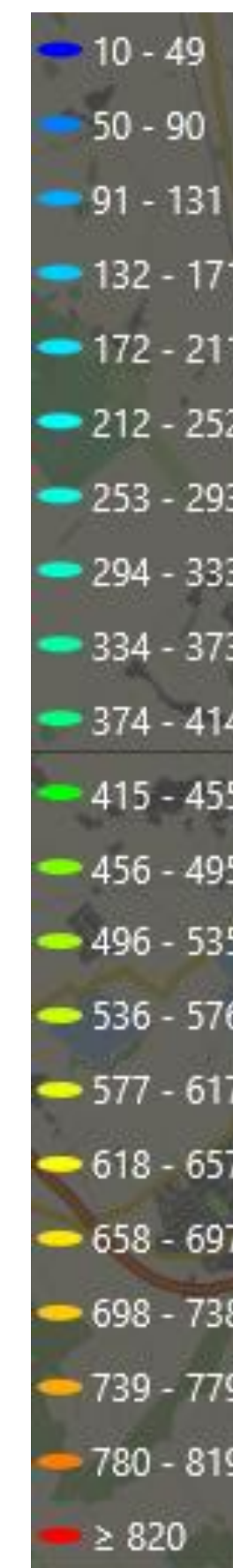
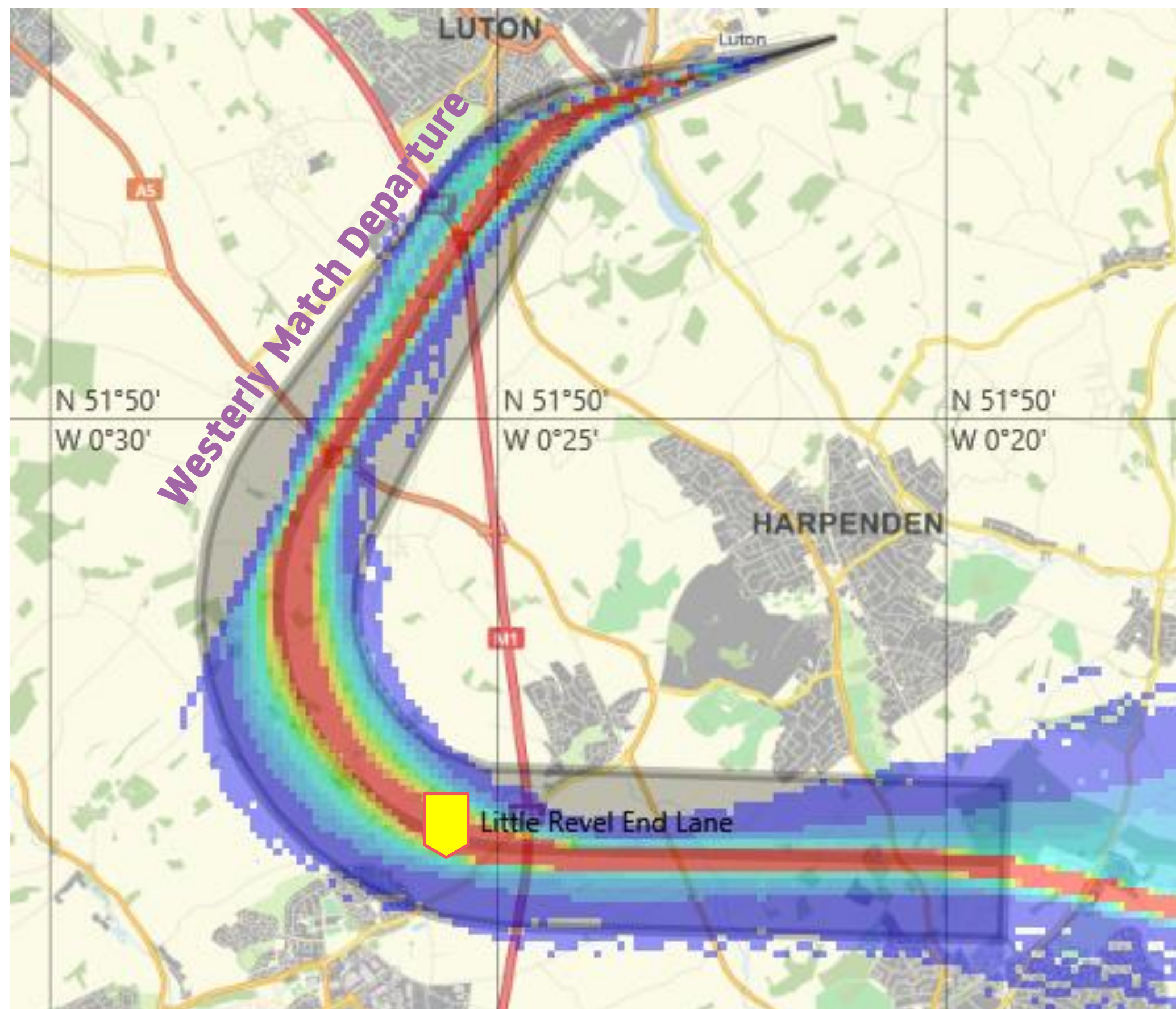
The graph below represents the average number of departures during the monitoring period. Depending on the operating direction on the day, residents in Redbourn may experience different flight patterns. During the peak periods, local residents of Redbourn may notice more frequent aircraft movements. In general, the morning peak starts at 0600 and may last up to 4 hours. On a day of westerly operation which occur approximately 70% of the time annually, residents may notice more aircraft flying close to Redbourn.

During the night period of 23:00 – 06:00 in the monitoring period, there was an average of 10 departures.



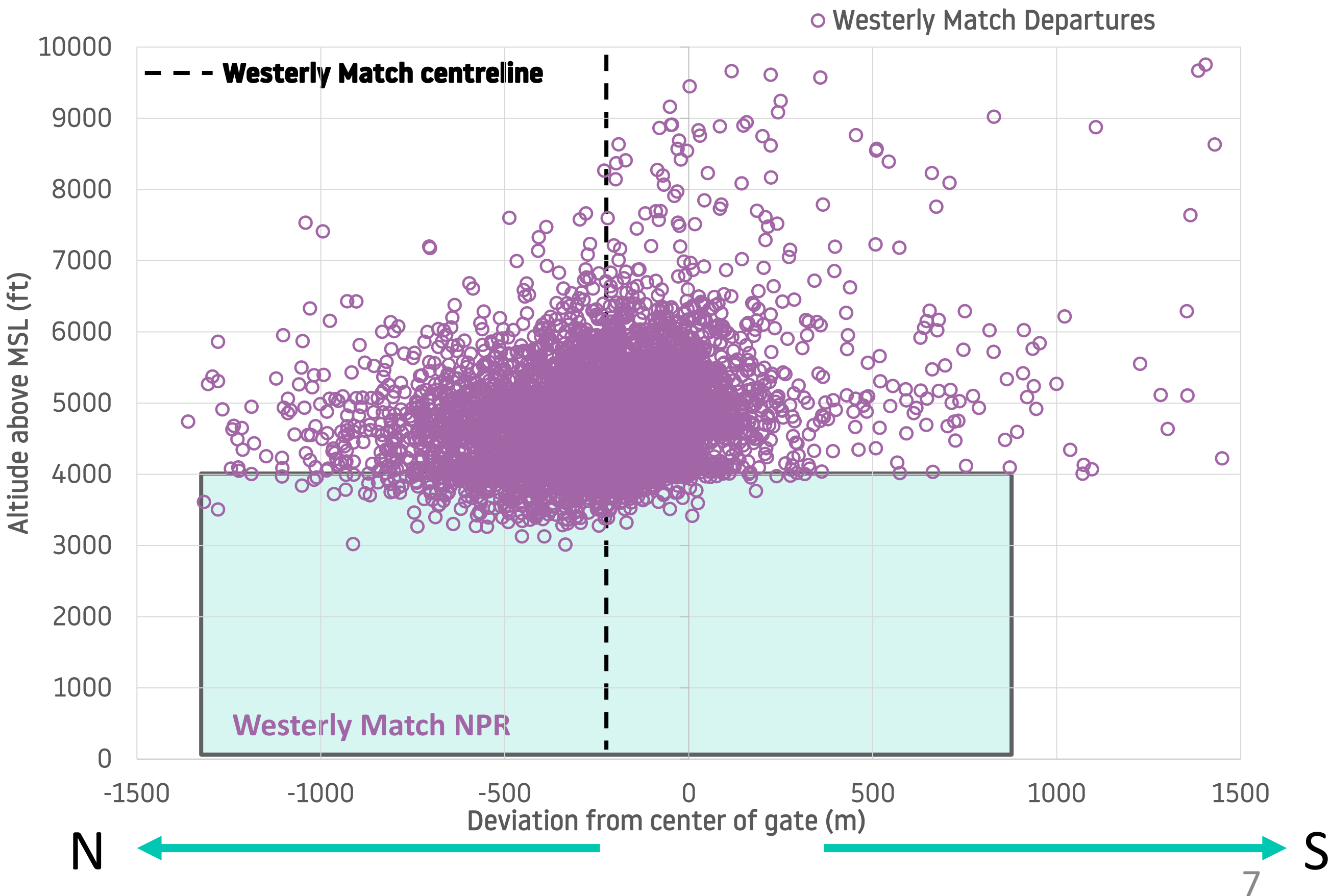
Aircraft Tracks

The heat maps below show the representative flight tracks that passed near the noise monitor terminals during the monitoring period. The yellow pinpoint indicates the location of the noise monitor in Redbourn.



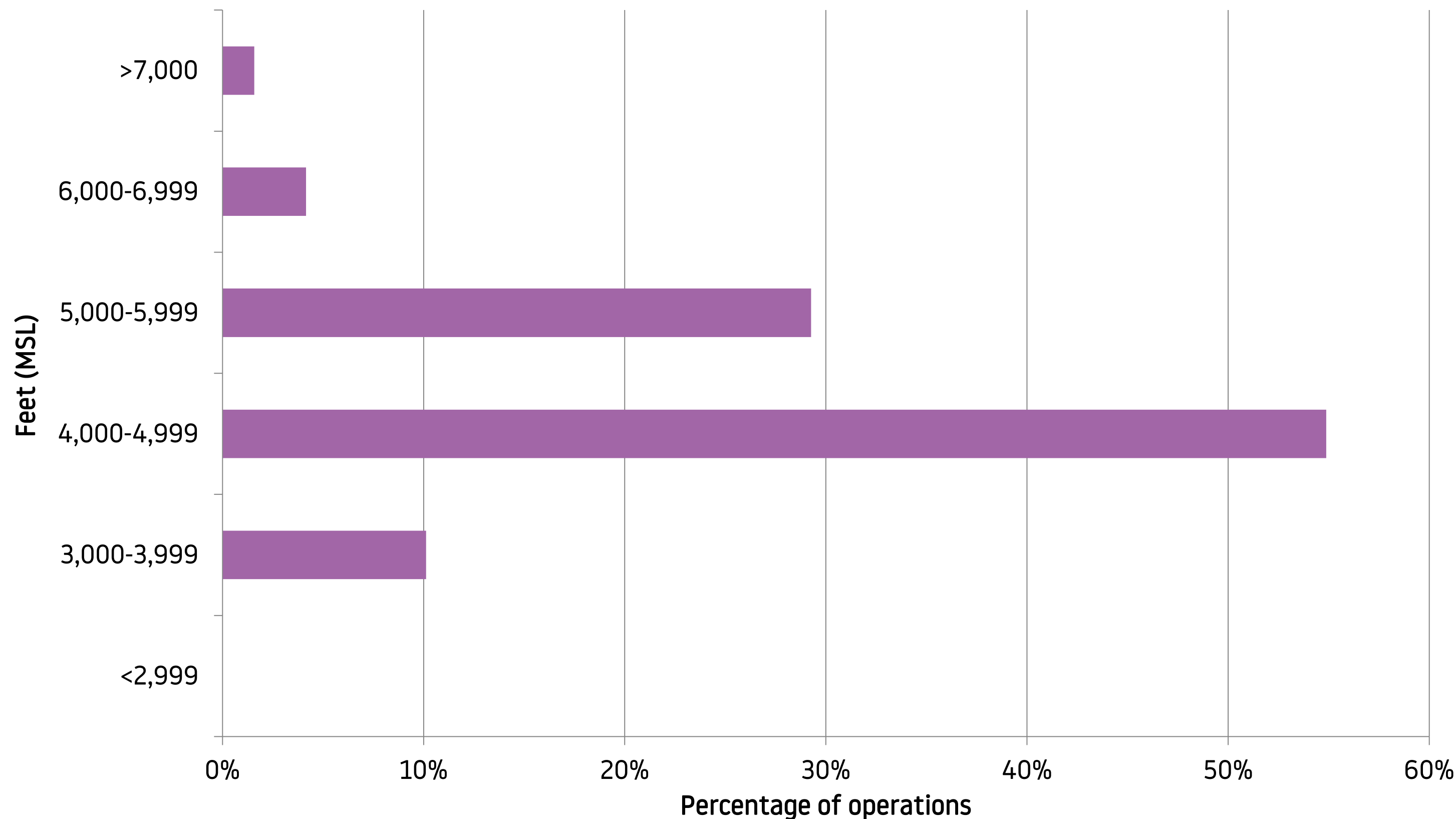
Altitude Gate Analysis

The altitude analysis for Redbourn 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 to south and will gather 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. The westerly Match noise preferential route (NPR) is labelled and displayed by the shaded area. Departing aircraft must remain within the NPR until reaching release altitude of 4,000ft at all times. Due to the close proximity of Redbourn to the departure routes, local residents may see aircraft flying near Redbourn at an altitude of above 3,000ft. There was no aircraft which flew outside the NPR below 3,000 feet within 1.5km either side of the gate. Some aircraft may have flown outside the NPR which are not displayed in this analysis, these were due to strong wind condition.



Altitude Gate Analysis

The bar chart shows the altitude spread when aircraft reach the noise monitor in Redbourn. For westerly departures, the average altitude of aircraft in this area was 4,816 feet above sea level (ASL) (4,426 feet above ground level [AGL]). It shows the majority of the flights departed on westerly Match route were above 3,000 feet ASL.



Aircraft Type	Number of movements	Average Altitude (AMSL in ft)
A306	67	5,147
A319	265	4,796
A320 CEO	1,337	4,686
A320 NEO (A20N)	423	4,974
A321 CEO	1,063	4,737
A321 NEO (A21N)	736	4,770
B737-800 NG (B738)	473	4,498
B737 Max 8 (B38M)	113	4,587
Global Express (GLEX)	119	4,894
Cessna 560X (C56X)	82	5,061
Gulfstream G560 (GLF6)	53	5,055
All	5,579	4,816

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 Redbourn, the noise monitoring terminal collected readings from 4,217 westerly Match departing aircraft. During the period, there were total of 6,710 westerly Match 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.

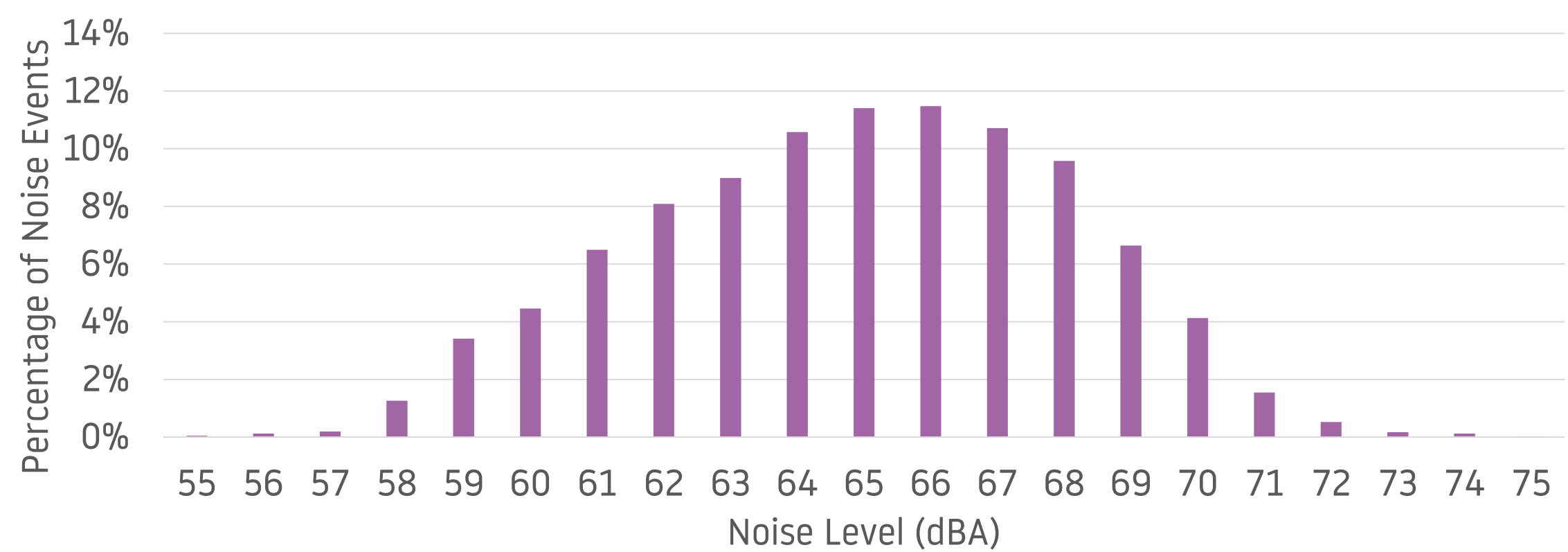
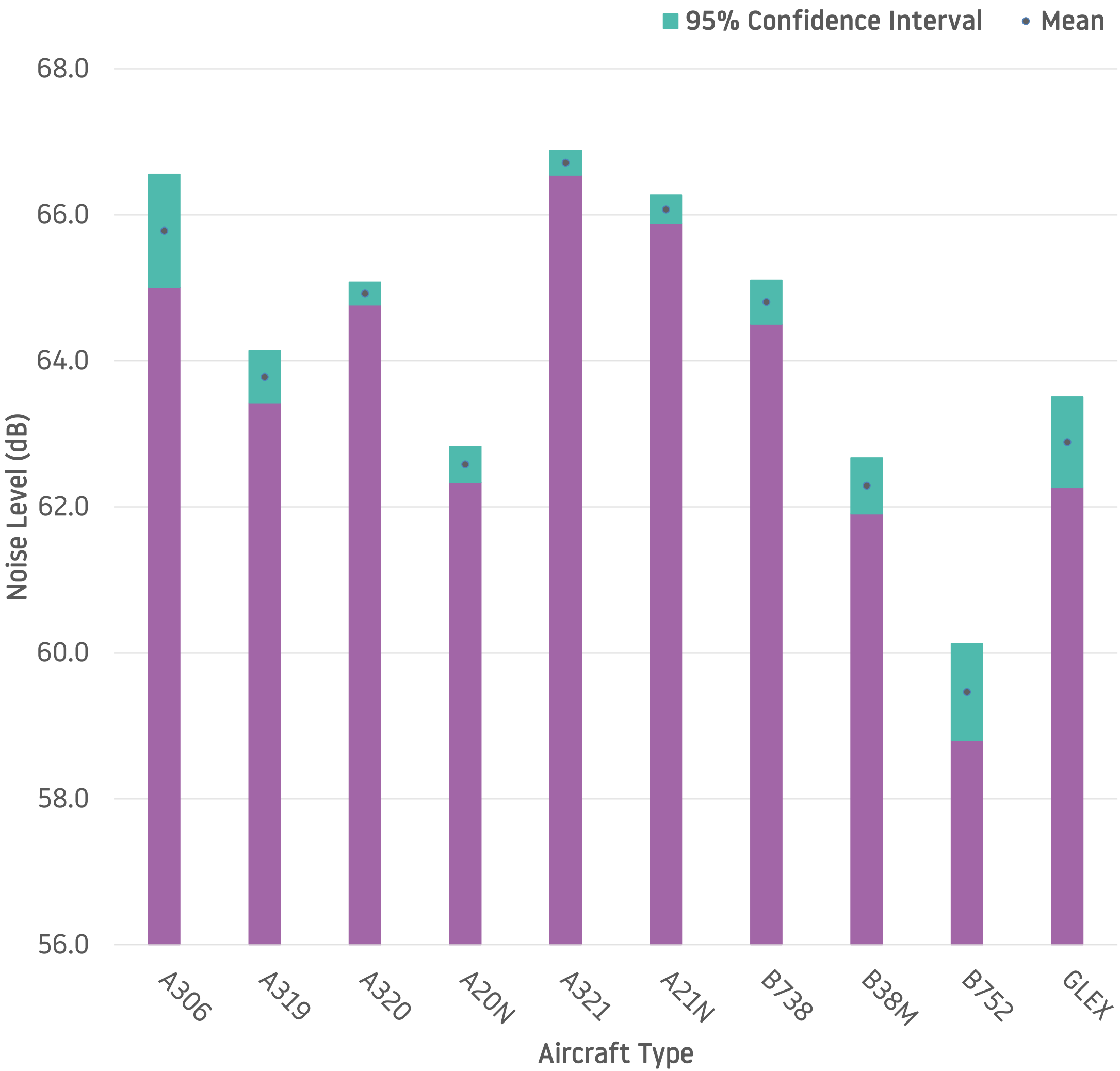
The weather also plays a big part in the data recorded and in periods of extreme weather i.e (very strong winds) the equipment can record noise incorrectly, so we exclude samples from the analysis during these weather conditions. When analysing the samples, we ensure that there is no unusual noise event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

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

Westerly Departures - Noise Results

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	56	65.8
A319	195	63.8
A320 CEO	1,111	64.9
A20N (A320 NEO)	308	62.6
A321 CEO	859	66.7
A21N (A321 NEO)	614	66.1
B738	417	64.8
B38M (B737 Max 8)	97	62.3
B752	52	59.5
GLEX (Global Express)	88	62.9
All Aircraft Types	4,217	64.9



*The noise results shown in the analysis are only for those aircraft types that recorded more than 50 events per aircraft

Noise Results - Summary

- At Redbourn, residents may experience aircraft noise as Redbourn is underneath the westerly MATCH departure route. Residents may notice there are more aircraft flying near the area on the days of westerly operation which average around 70% of the year.
- The average westerly departure noise in Redbourn is 64.9dB. During the monitoring period, the noise monitor was only able to capture 4,217 aircraft sound events from 5,579 movements passing through the gate as shown in the previous section. This is due to the high altitude of aircraft at a wider spread location and the ambient background noise.
- The table shows the average noise for each aircraft type and the green bar on the chart shows the uncertainty caused by the spread in readings and the sample size (95% confidence interval).
- From the results, Luton's most popular aircraft Airbus A320 CEO and A321 CEO have an average noise of 64.9dB and 66.7dB respectively in Redbourn.
- The departure noise from the newer generation aircraft, A320 NEO and A321 NEO, produced less noise than the CEOs, at an average of 2.3dB and 0.6dB quieter, respectively. Similar for the Boeing 737 series, the new B737 Max 8 was 2.5dB quieter than its predecessor B737-800NG. In the sample, 24% of the movements were newer generation aircraft which are more fuel efficient and quieter. Comparing to previous year, the NEO typed aircraft accounted for 6% all air transport movements in 2020.
- The A321 was the noisiest aircraft type at Redbourn during the monitoring period. It measured an average of 66.7dB. This aircraft type is an extended version of the A320 Family which carries more passengers and is typically heavier. As more engine thrust is needed to climb and maintain altitude, more noise could be experienced on the ground.
- During the monitoring period, LLA conducted a NADP trial on the westerly Match departure route. This may change the noise effect on the ground at Redbourn. A more in-depth analysis and results will be published in the NADP report which can be found on the LLA Noise webpage once published.

Conclusion

- A mobile noise monitor was installed at a residential property on Little Revel End Lane for a three-month period
- For Redbourn, it specifically related to westerly Match departures. During the monitoring period, the airport was using westerly operations for 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 average altitude of westerly departing aircraft in Redbourn is 4,816 feet above sea level (ASL), and as Redbourn is already approximately 390 feet ASL, aircraft will typically be 4,426 feet above ground level (AGL) in this area.
- All aircraft shown in the altitude analysis flew within or above the NPR corridor. Some aircraft may have flown outside the NPR which are not displayed in this analysis, this could be due to the distance of the gate analysis only covering a certain area.
- The main aircraft type operating at London Luton Airport is the Airbus A320 CEO and A321 CEO which produced an average noise of 64.9dB and 66.7dB respectively in Redbourn on a day of westerly operation. 24% of the noise events recorded in Redbourn were created by the newer generation aircraft, A320 NEO and A321 NEO, registering lower average departing noise events of 62.6dB and 66.1dB respectively. The Boeing's Max aircraft also achieved significant noise reduction at Redbourn.
- During the monitoring period, 39 aircraft (both westerly and easterly) were investigated as part of the Noise and Track violation scheme. 18 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>.
- During the monitoring period, LLA conducted a NADP trial on the westerly Match departure route. A more in-depth analysis and results will be published in the NADP report which can be found on the LLA Noise webpage once published.

Glossary of Terms

NADP Trial: At London Luton Airport, operators use a mix of Noise Abatement Departure Procedures. These are known as Noise Abatement Departure Procedure 1 (NADP1) and Noise Abatement Departure Procedure 2 (NADP2). These procedures are designed to distribute the noise from an aircraft in different ways. For more details, please read the [NADP Project Plan](#) which is available on the [LLA Noise webage](#).

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 Redbourn.

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.

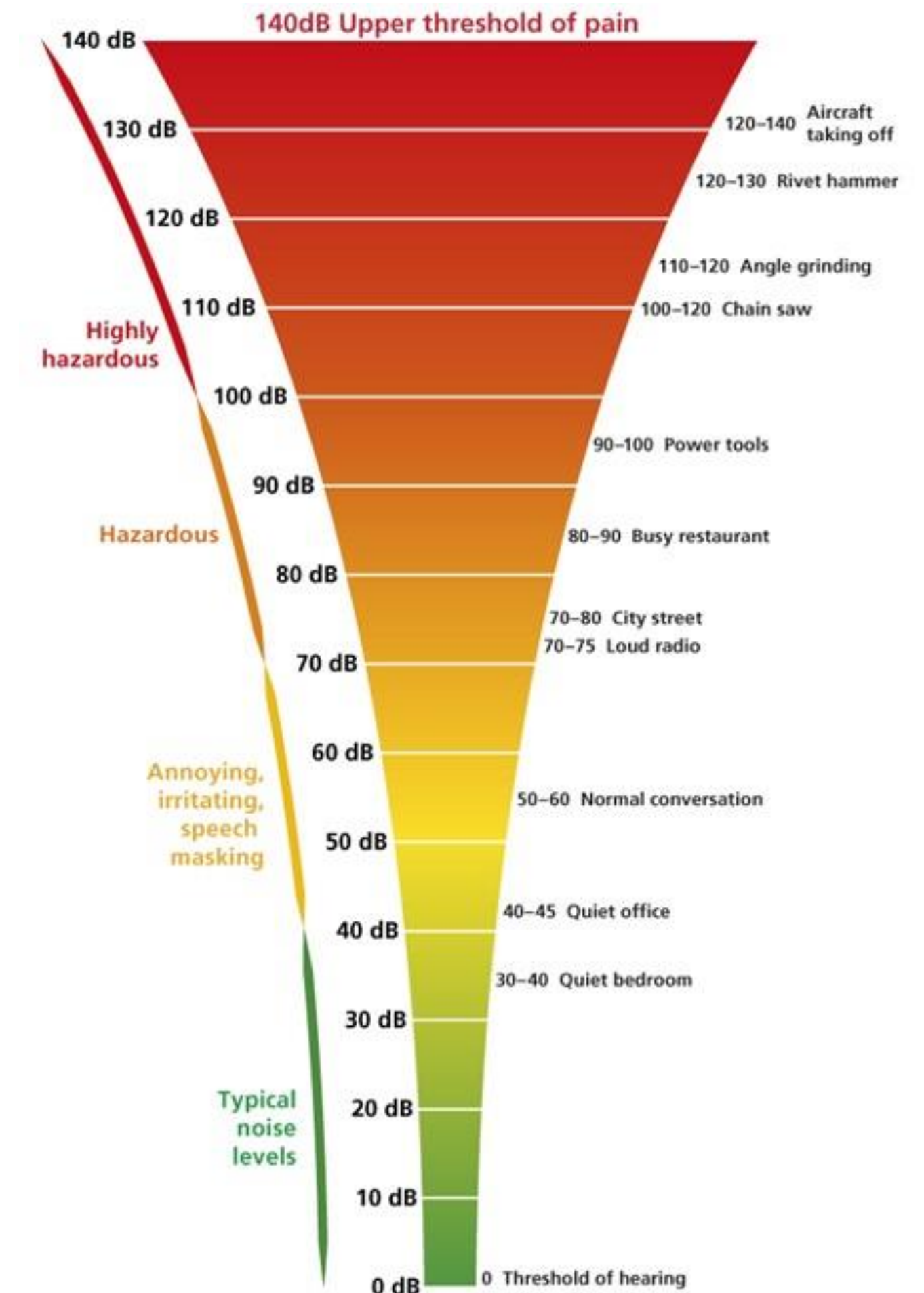
Gate Analysis: A gate which is drawn across an area and will gather information about every aircraft passing through the gate area.

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