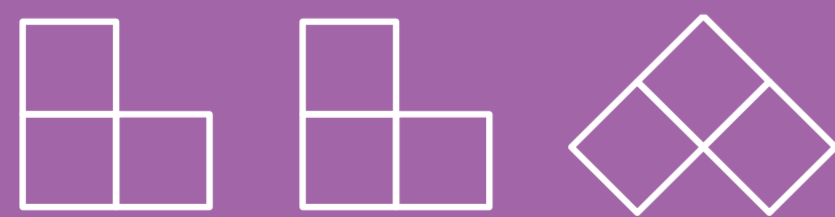


Community Noise Report

Sheffield

April – July 2022



London Luton Airport

Introduction

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

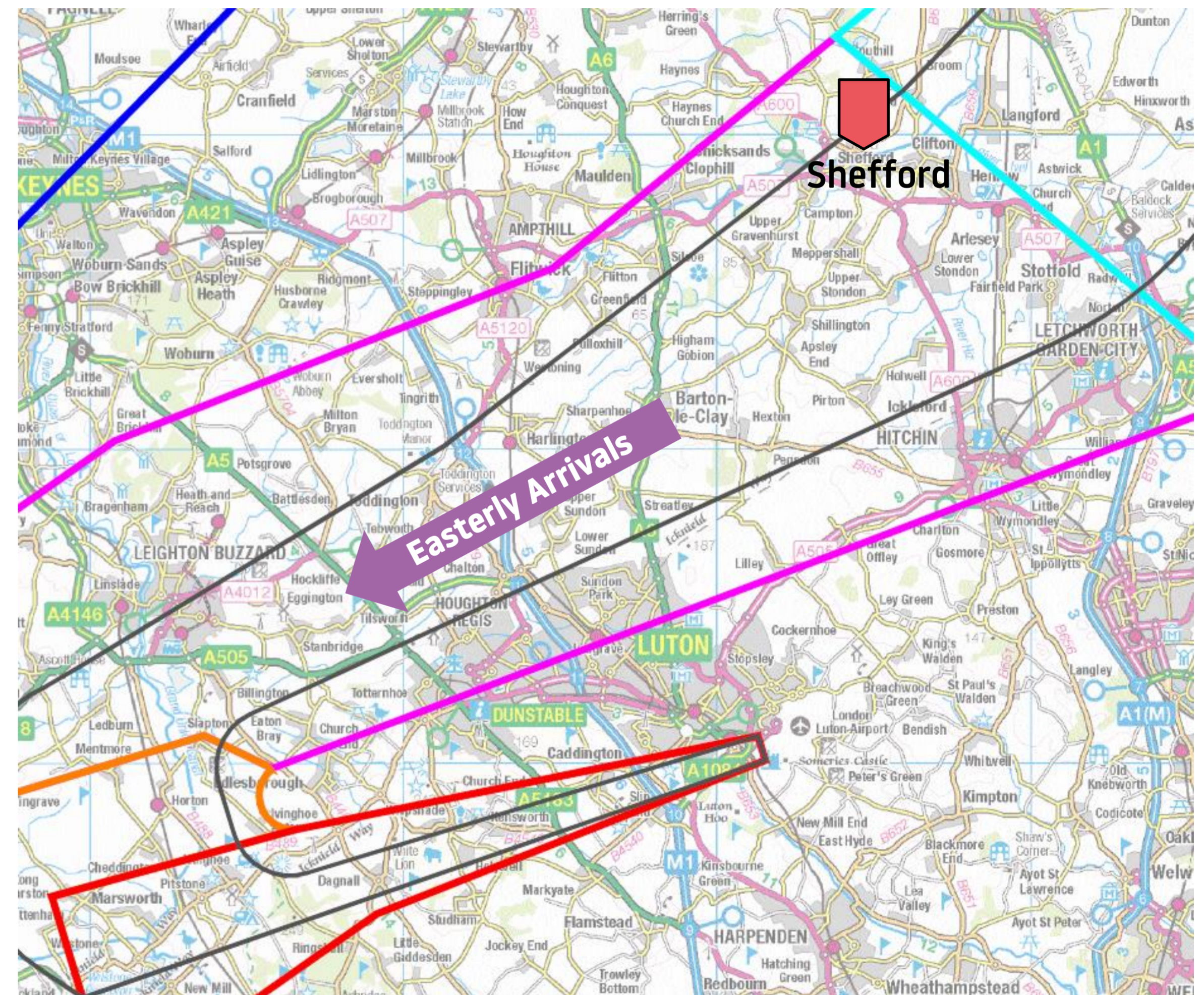
The purpose of the monitoring in Shefford is to understand the typical noise levels created in the local community. For Shefford, it is specifically related to the Luton arrivals. The arrival vectoring area is shown on the map. Aircraft tend to fly at approx. 5,000ft in this area.

In Feb 2022, an airspace change was implemented in this area, this was a co-sponsored proposal from both NATS and London Luton Airport. The aim of this airspace change was to separate Luton's arrival routes from Stansted's arrival routes.

The noise monitor was located at a residential property on Stanford Road, underneath the arrival vectoring area where aircraft will fly near or over Shefford. The red pinpoint on the map shows the noise monitor location, at an altitude of 133 feet above sea level.

The noise monitor in Shefford was in place between 28th April and 19th July 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.



Greatest concentration of traffic within black line area

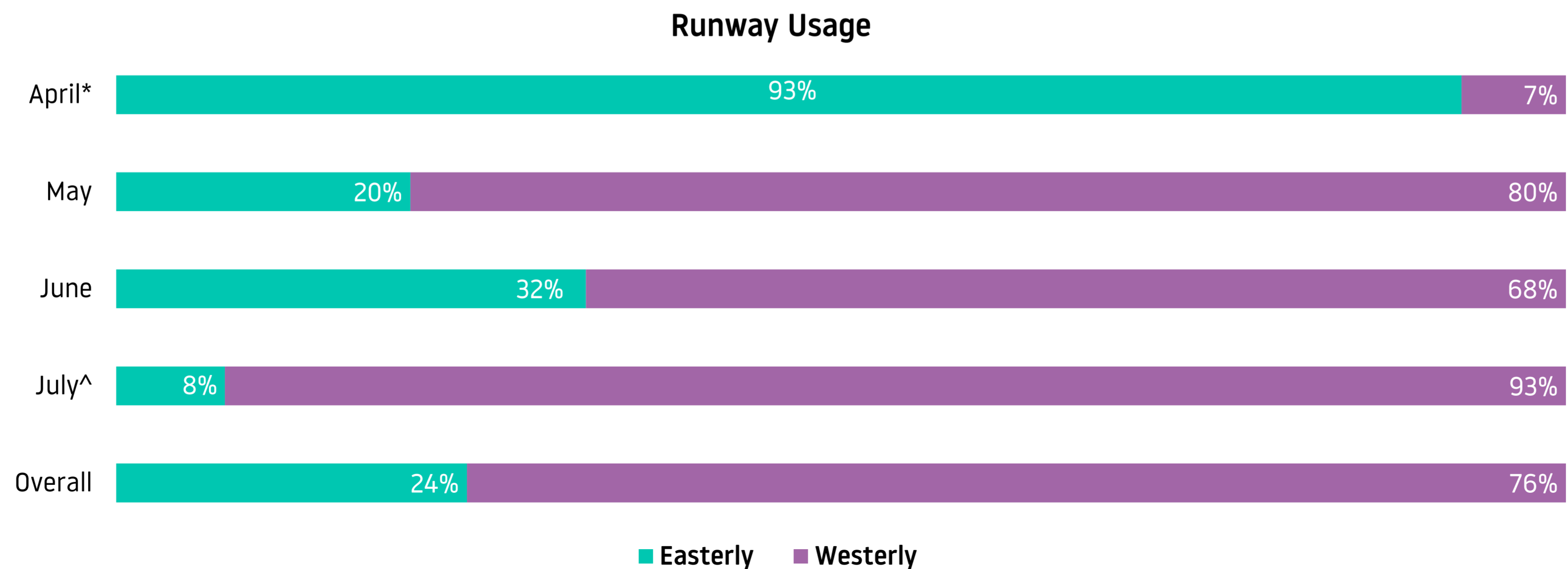
- Level at 5,000ft
- 5,000ft-4,000ft
- 4,000ft & below

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 24% easterly and 76% westerly. The five-year average for this time of year is 39% easterly vs 61% westerly.

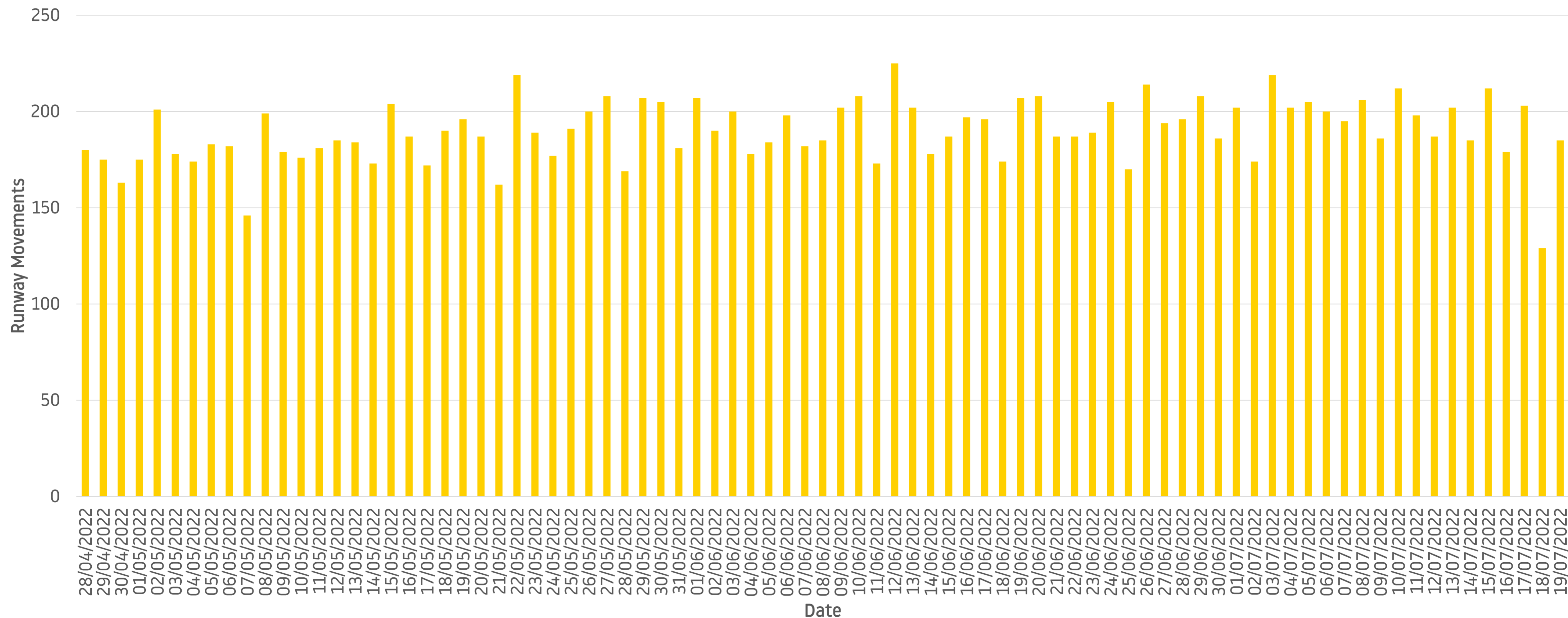
There were 15,841 aircraft arrived on the easterly and westerly runway whilst the noise monitor was located in Shefford. In terms of total air transport movements, LLA was operating at 88% of pre-pandemic level. In the days of easterly operation, residents in Shefford may see more arriving flights flying near or above Shefford as the aircraft is instructed to fly towards the direction of Leighton Buzzard in order to sequence aircraft to the easterly runway.



*28th – 30th April 2022
^1st – 19th July 2022

Daily Movements During Monitoring Period

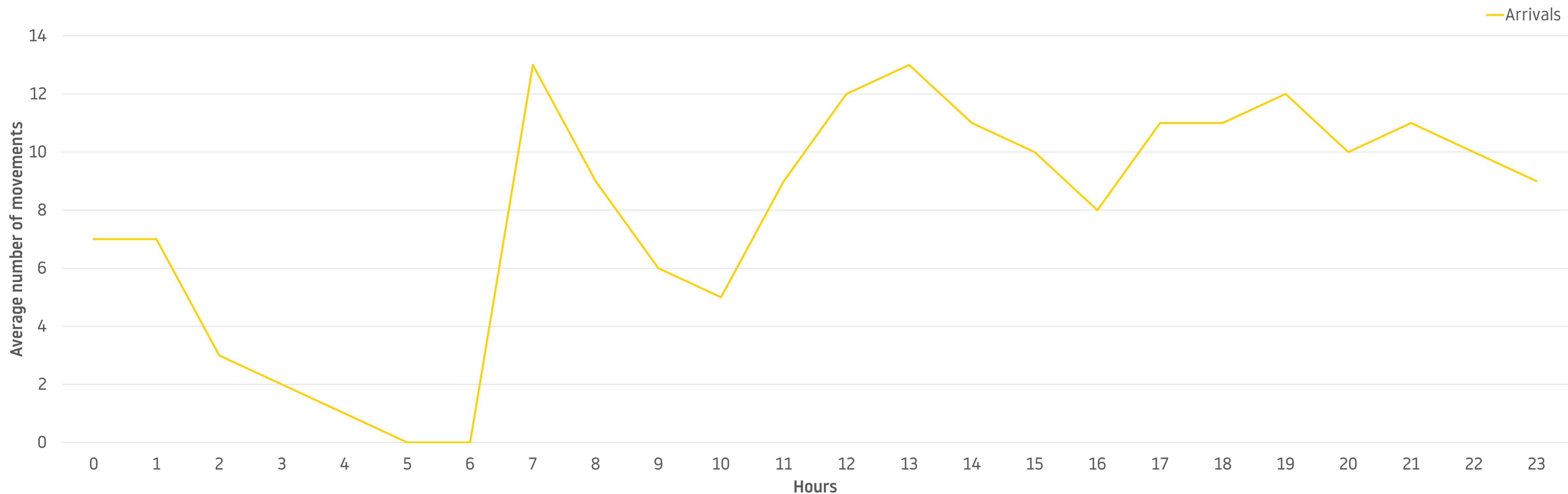
The chart below shows the number of daily arrivals that passed over the noise monitor. Due to the location of the noise monitor, some flights on arrival into Luton would have passed Shefford.



Operations During the Monitoring Period

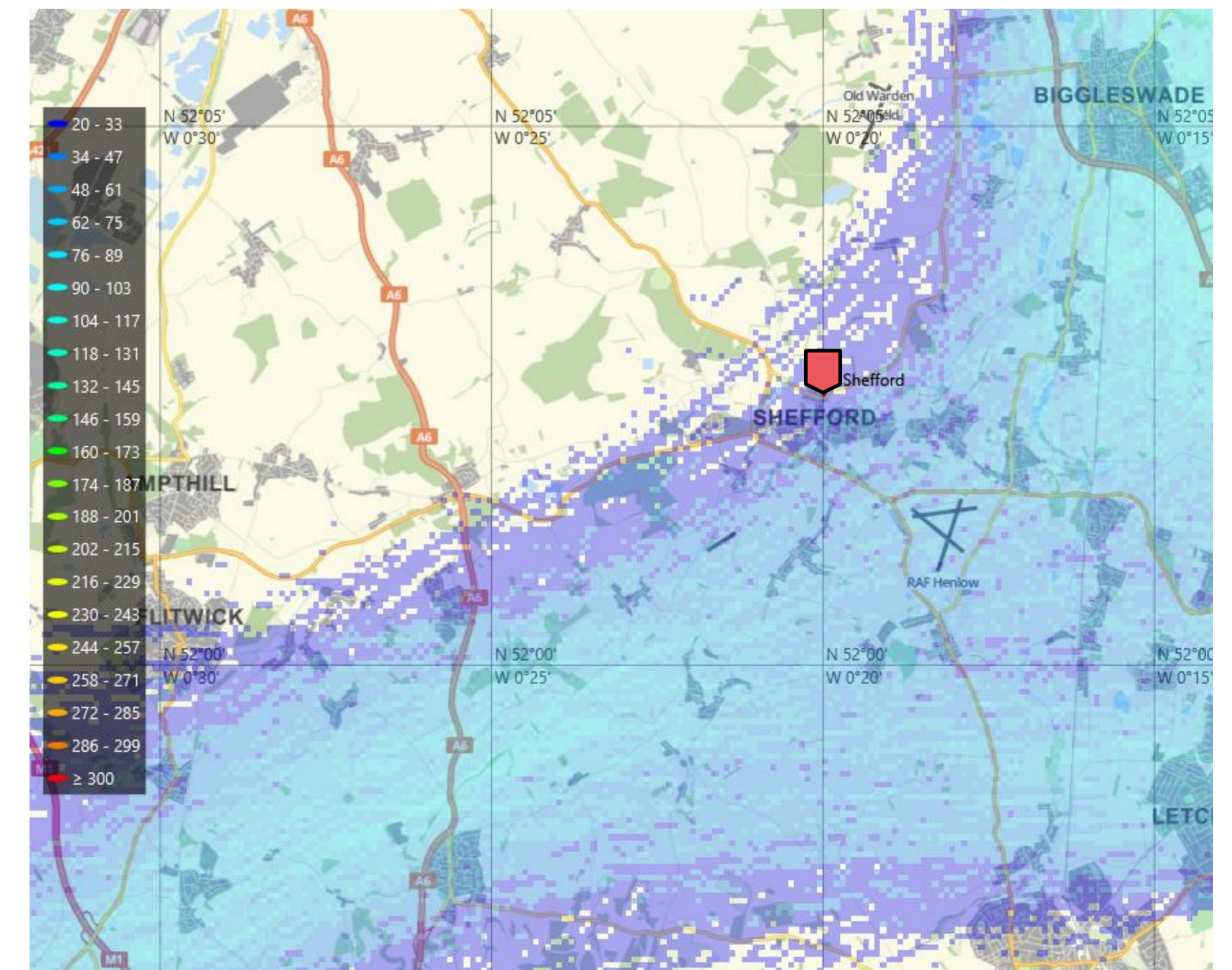
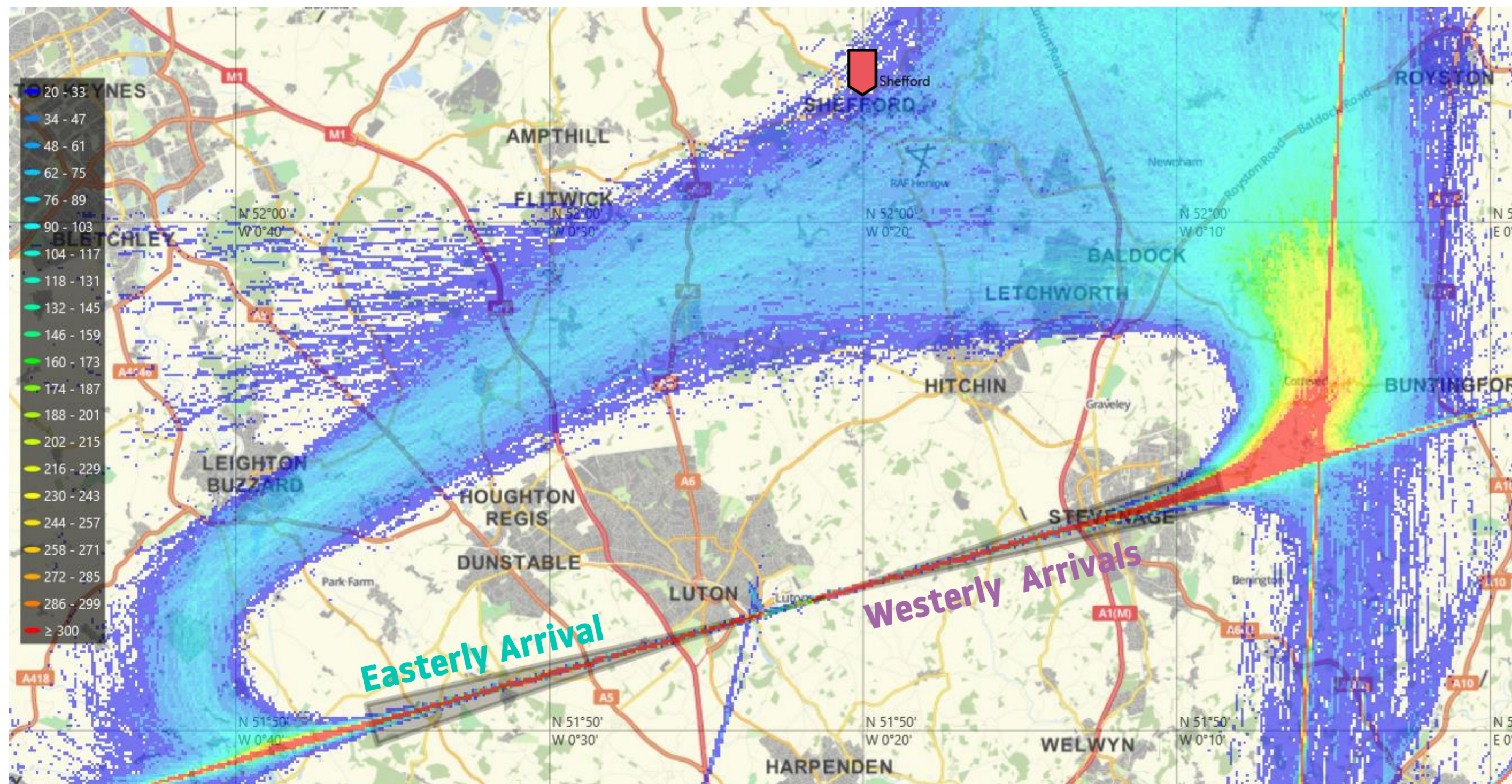
The graph below represents the average aircraft movement by hours during the monitoring period. Depending on the operating direction on the day, residents in Shefford may experience different flight patterns. During the peak periods, local residents of Shefford may notice more frequent aircraft movements. The graph below shows the peak times periods, during a 24hr period over the noise monitor terminal. Residents will notice the morning peak begin at 07:00 and another peak at 13:00 during the day.

During the night period of 23:00 – 06:00 in the monitoring period, there were average of 29 arrivals during this period.



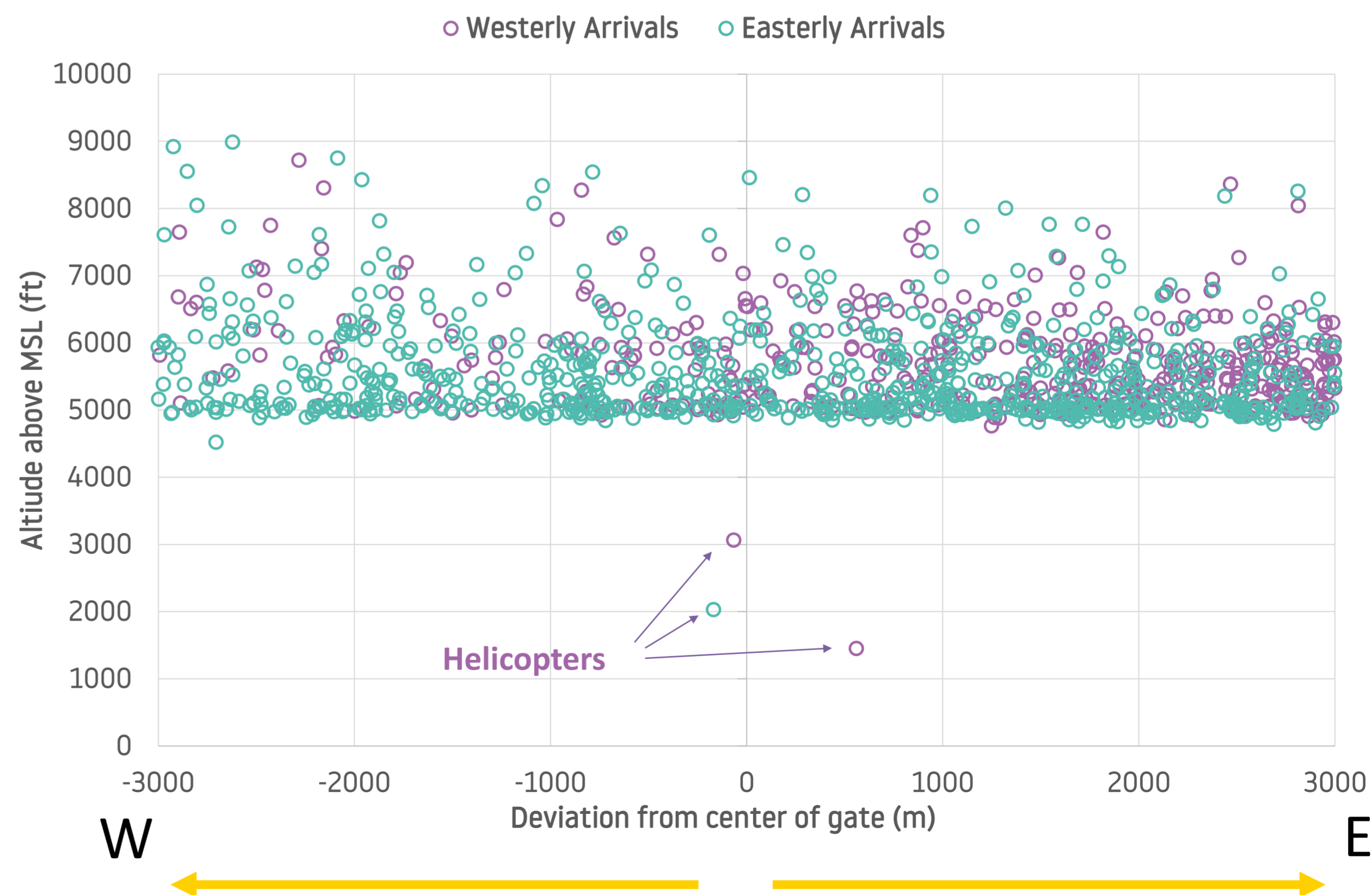
Aircraft Tracks

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 Shefford. At this location, it is affected by arrivals. The map below highlights the density of flights, on the westerly arrivals the density can be seen to fly further to the east of Shefford, for easterly arrivals it is more likely to fly close or over Shefford. This is shown in more detail in the next section - Altitude Analysis.



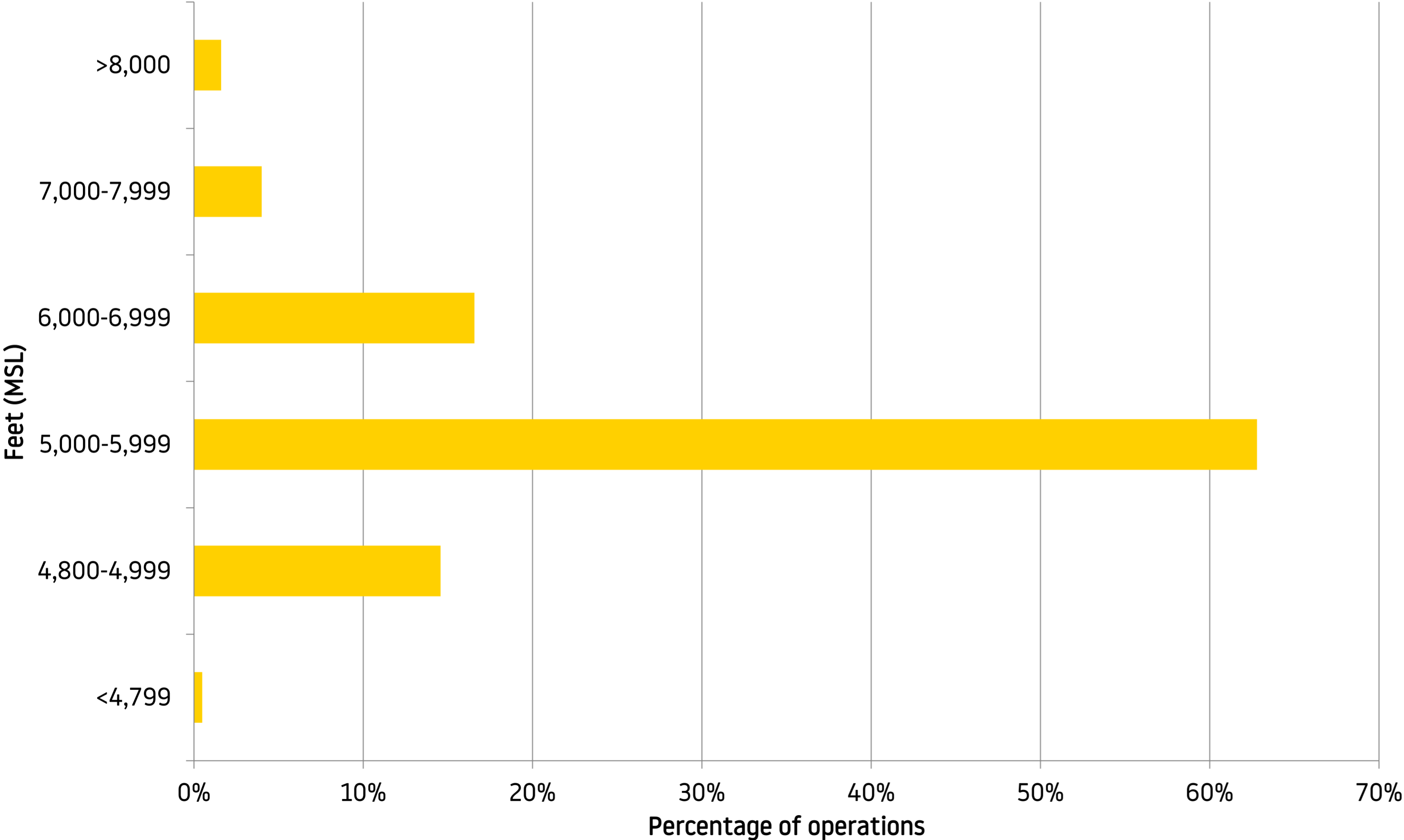
Altitude Gate Analysis

The altitude analysis for Shefford shows the vertical and lateral dispersion of aircraft 3km either side of the noise monitor. The map below shows the 6km gate which is drawn west to east 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. At lower altitude on the chart, helicopters are identified, these are flying with visual reference points and are typically lower than commercial movements. Due to the distance of the noise monitor from the arrival routes, local residents may see aircraft flying above Shefford at altitude above 5,000ft.



Altitude Gate Analysis – Arrivals

The altitude analysis shows arriving aircraft that flew close or over Shefford. The bar charts in this section shows the concentration of the aircraft when aircraft reach the noise monitor in Shefford. For arrivals, aircraft tend to be at above 5,000 feet, due to the proximity to the runway at Shefford. The analysis shows that most aircraft fly above 5,000 feet when arriving aircraft reach Shefford. The average altitude of aircraft in this area was 5,602 feet AMSL (5,469 feet AGL).



Aircraft Type	Number of movements detected	Average Altitude (AMSL in ft)
A306	12	5,903
A319	119	5,515
A320 CEO	288	5,610
A320 NEO (A20N)	87	5,736
A321 CEO	158	5,587
A321 NEO (A21N)	102	5,582
B737-800 NG (B738)	130	5,874
B737 Max 8 (B38M)	22	5,759
Global Express (GLEX)	40	5,271
Cessna 560X (C56X)	26	5,373
Gulfstream G560 (GLF6)	20	5,670
Challenger 350 (CL35)	20	5,420
All	1,250	5,602

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 Shefford, the noise monitoring terminal collected readings from 323 arriving aircraft. During the period, there were 15,841 arrivals.

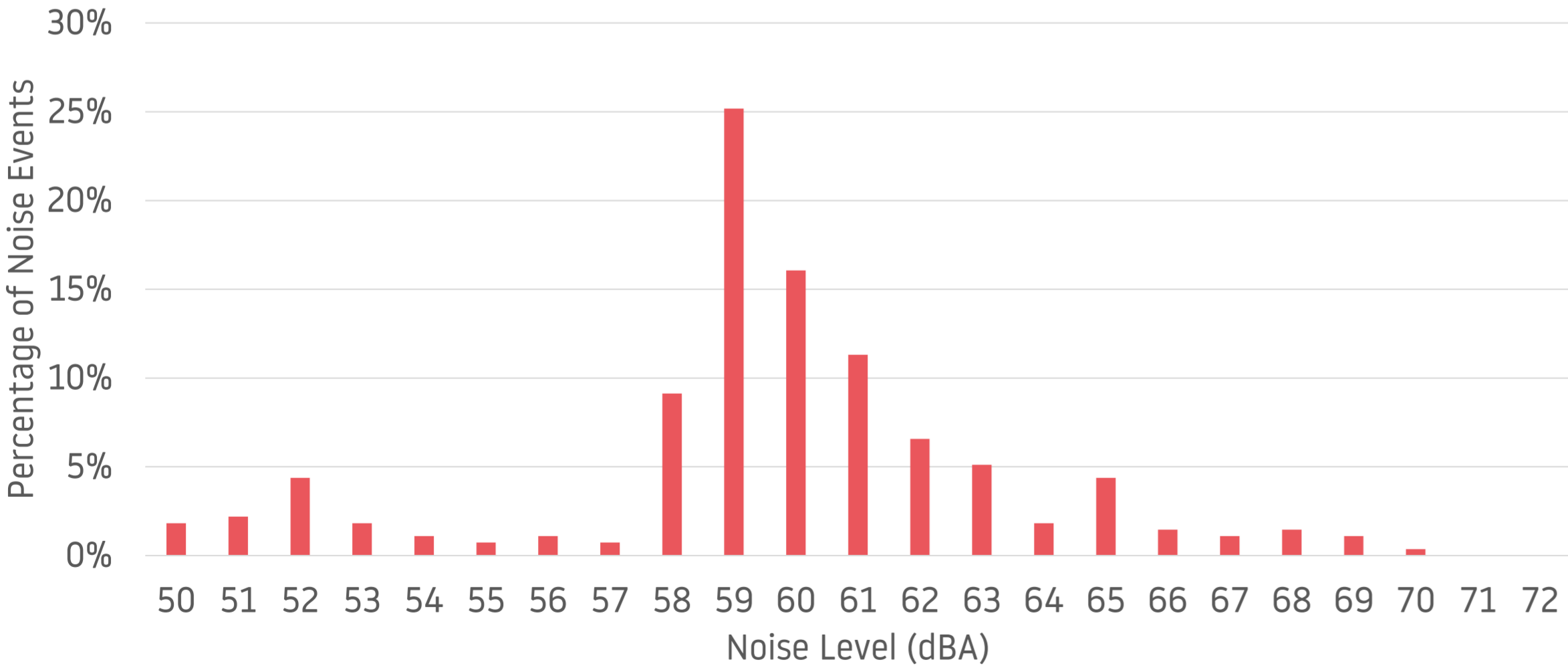
It is noteworthy that the noise monitor may not be able to record every aircraft noise event if the aircraft noise level is below ambient background noise. In addition, not all aircraft flew near the noise monitor. Therefore, there may be a difference between the number of actual air transport movements 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, it was ensure that there is no unusual noise event present which might not be caused by aircraft (i.e. vehicles or wildlife). No recording was excluded from the analysis for the above reasons despite some of the higher reading recordings were unable to verify that the source of sound was from aircraft.

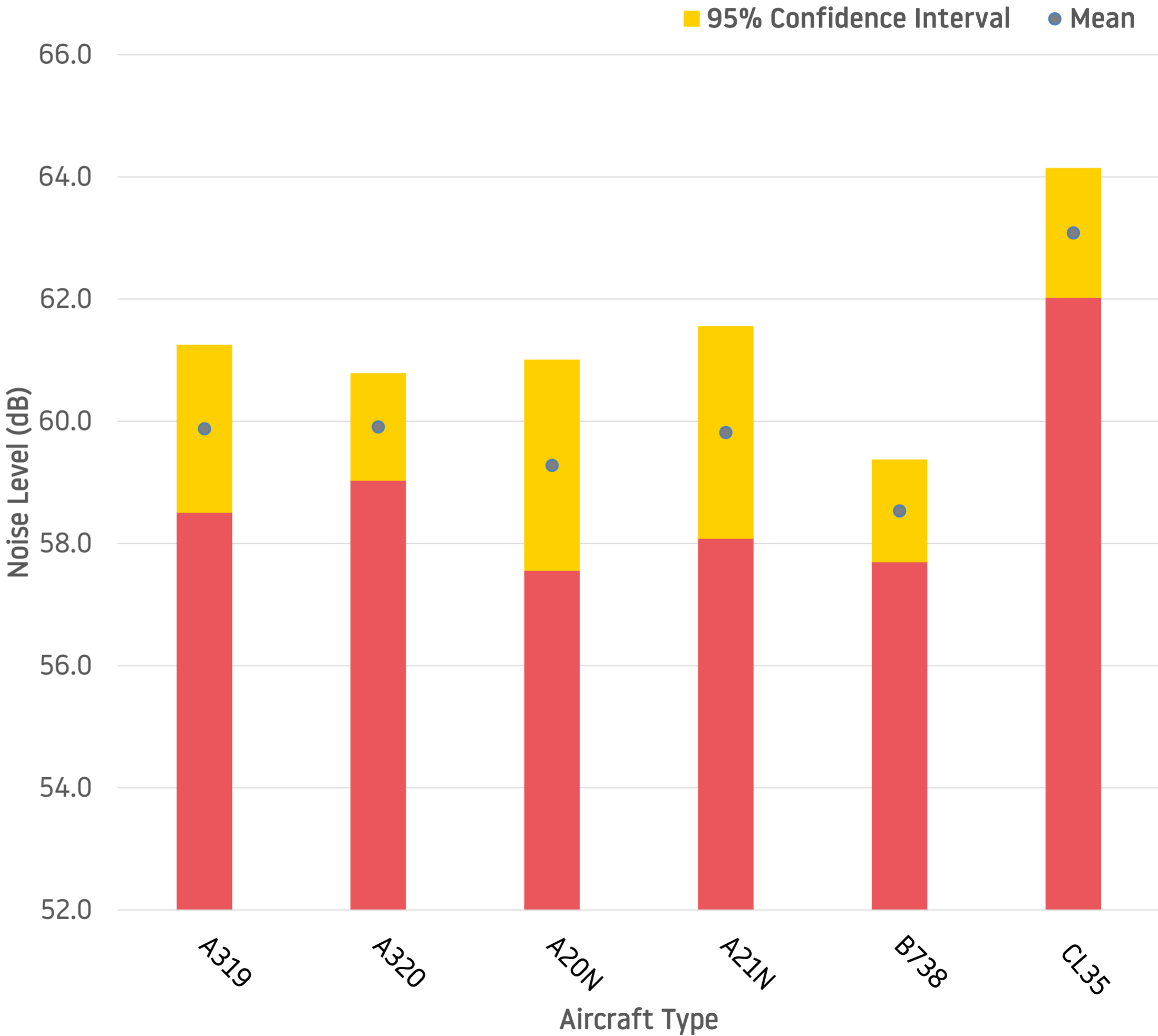
Noise Results – Easterly Arrivals

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)
A319	35	59.9
A320 CEO	65	59.9
A320 NEO (A20N)	20	59.3
A321 NEO (A21N)	35	59.8
B737-800 NG (B738)	56	58.5
Challenger 350 (CL35)	19	63.1
All Aircraft	323	59.8



*The noise results shown in the analysis are only for those aircraft types that recorded more than 15 events per aircraft.



Noise Results - Summary

- On Stanford Road in Shefford, residents may experience aircraft noise as Shefford is underneath the AD6 arrival vectoring area. Residents may notice there are more aircraft flying near the area on the days of easterly operation which average around 30% of the year.
- The average easterly arrival noise on Stanford Road in Shefford was 59.8dB, based on a sample size of 323.
- During the monitoring period, the noise monitor was only able to capture 323 aircraft sound events from 1,250 movements passing through the gate as shown in the previous section. This is due to the high altitude of aircraft and the ambient background noise.
- From the results, Luton's most popular aircraft type by operators, Airbus A320 CEO, had an average noise of 59.9dB.
- 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 true average might be lower because some of the aircraft sound events could not be captured by the noise monitor due to the ambient background sound level.
- The Challenger 350 (CL35) was the noisiest aircraft type at Shefford. This aircraft type generally fly slightly lower than the other jet aircraft. The altitude analysis shows they were flying at average of 200ft lower.
- In Q2 2022, LLA recorded 16% of all transport movements were the newer generation aircraft which are more fuel efficient and quieter. This will continue to increase as operators at LLA operate more greener aircrafts into and out of Luton.

Conclusion

- A mobile noise monitor was installed at a residential property on Stanford Road for 12-week period.
- For Shefford, it specifically related to easterly and westerly arrivals. During the monitoring period, the airport operated in the direction of easterly and westerly for 24% and 76% 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 arriving aircraft in Shefford is 5,602 feet above mean sea level (AMSL), and as Shefford is already approximately 133 feet AMSL, aircraft will typically be at 5,469 feet above ground level (AGL) in this area. Due to the location of the noise monitor, the altitude from arriving aircraft will be at 4,000 feet or higher, majority of aircraft arriving flew above 4,800 feet when they reach Shefford.
- The main aircraft type operating at London Luton Airport is the Airbus A320 CEO which produced an average noise of 59.9dB.
- 16% of the noise events recorded in Shefford were created by the newer generation aircraft, A320 NEO and A321 NEO. The A320 NEO registered average departing noise of 59.3dB, 0.6dB lower than A320 CEOs. The noise reduction achieved by these aircraft types provide noise and fuel benefit to the community. Operators at LLA will continue to utilise more greener aircrafts into and out of Luton as they expand their greener fleet in LLA.
- LLA publish other monitoring reports on a regular basis. These reports can be viewed and downloaded from the Noise webpage on the [LLA website](#).
- For more details of the AD6 Airspace change, please visit the [CAA Airspace Change Portal](#).

Glossary of Terms

AD6 Airspace Change: This was a co-sponsored airspace change proposal from both NATS and London Luton Airport. The aim of this airspace change was to separate Luton's arrival routes from Stansted's arrival routes. The new routes were consulted upon from October 2020 – February 2021. We then submitted the airspace change proposal to the Civil Aviation Authority (CAA) in June 2021 with them granting approval in November 2021. More details can be found in the [CAA Airspace Change Portal](#).

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 data 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.

