Community Noise Report

Flamstead and Markyate

June – October 2019

London Luton Airport

Version 1.0

Introduction

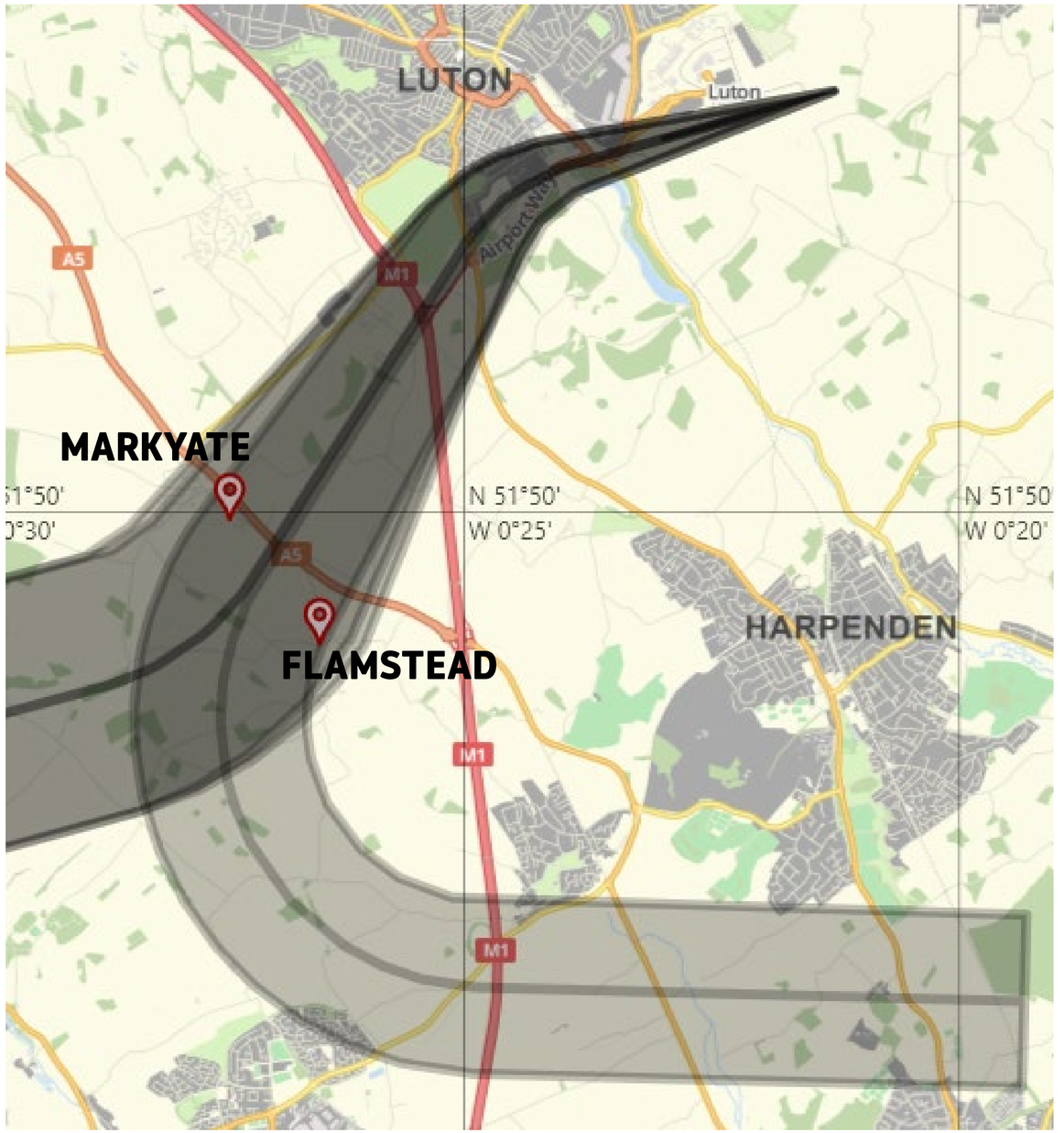
As part of the ongoing noise monitoring programme, London Luton Airport deployed portable noise monitoring terminals in Flamstead and Markyate.

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

The monitors' location were on the edge of the main westerly departure corridors approximately 7km from the Luton runway at an altitude of approximately 486 feet above sea level. The red pinpoints on the map show the locations of the noise monitor.

The noise monitor in Flamstead was in place between 25th June and 14th October 2019 whereas the noise monitor in Markyate was in place between 3rd July and 14th October 2019.

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.

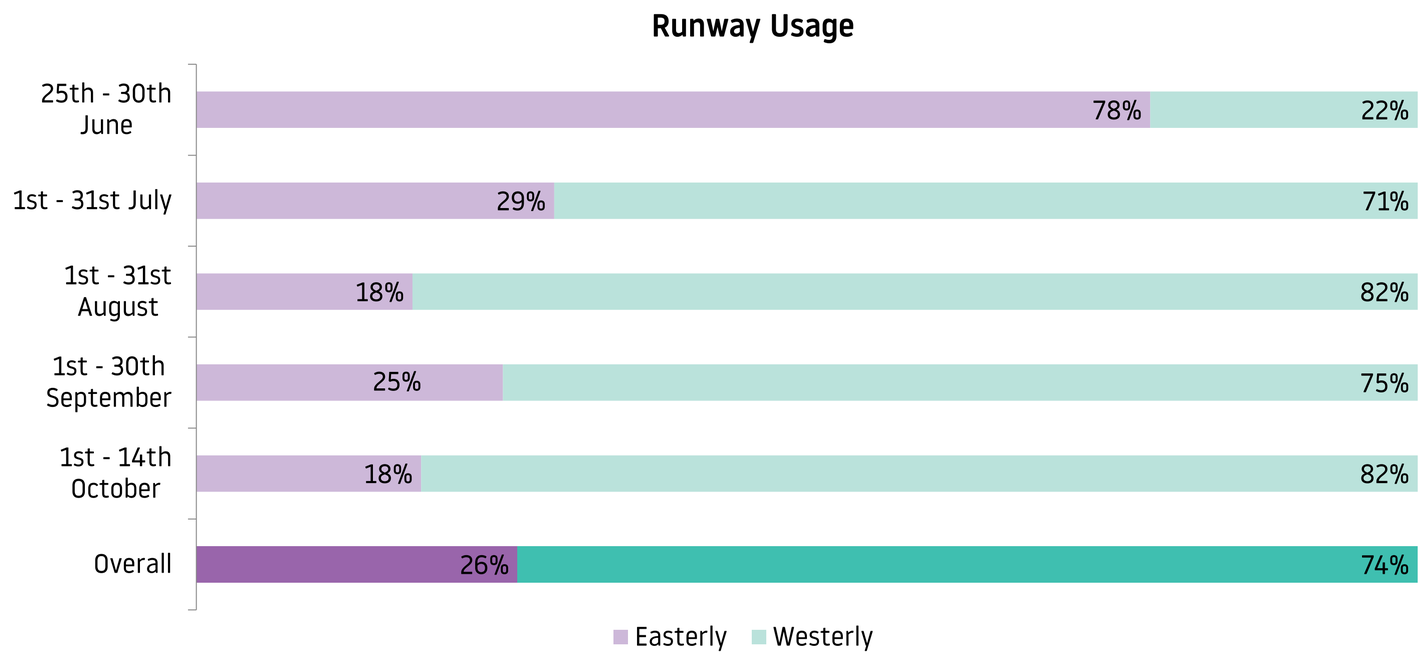


LLA Operations During the Monitoring

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.

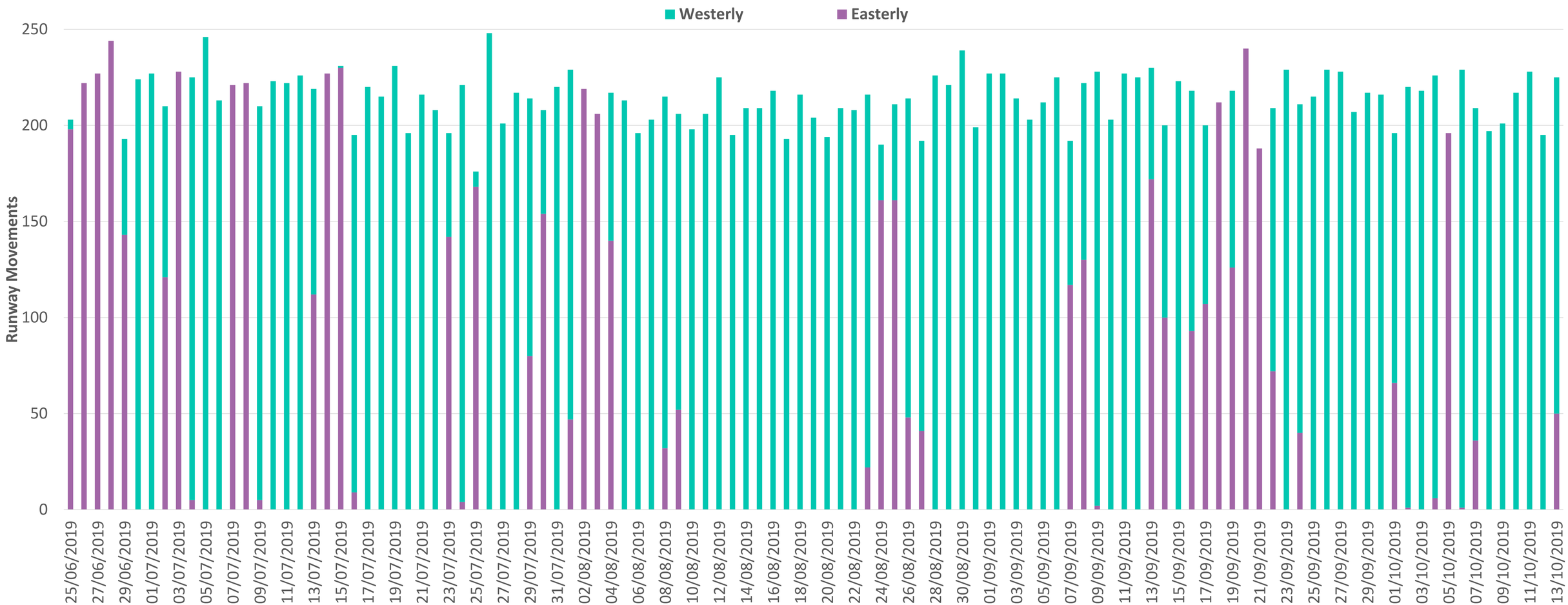
During the period of monitoring, the direction of operation was 26% Easterly and 74% Westerly. The 5 year average for this time of year is 24% Easterly vs 76% Westerly.

17,764 aircraft departed on westerly SIDs operated from the airport whilst the monitors were located in Flamstead and Markyate.



Daily Movements During Monitoring Period

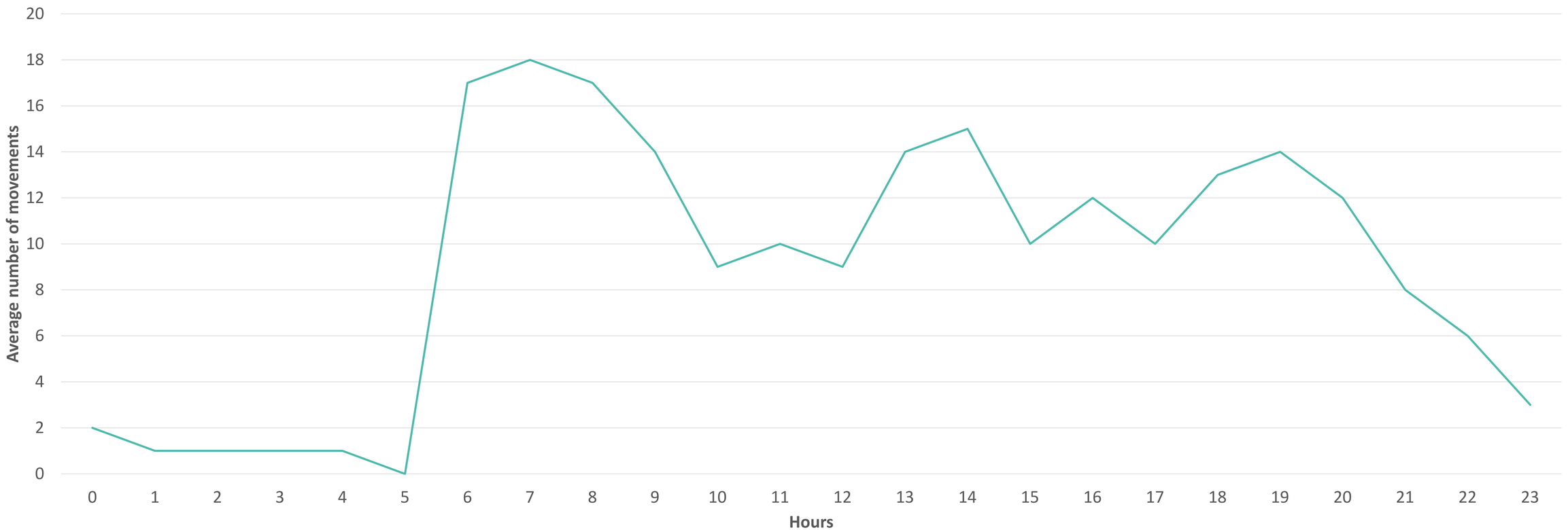
The chart below shows the number of daily departures that passed the noise monitor. Due to the location of Flamstead and Markyate, all flights that departed on our Standard Instrument Departure (SID) routes during westerly operations would have flown passed the monitors. During the monitoring period there were 13 full days of easterly operations and therefore no flight passed near the monitor on these days.



Operations During the Monitoring Period

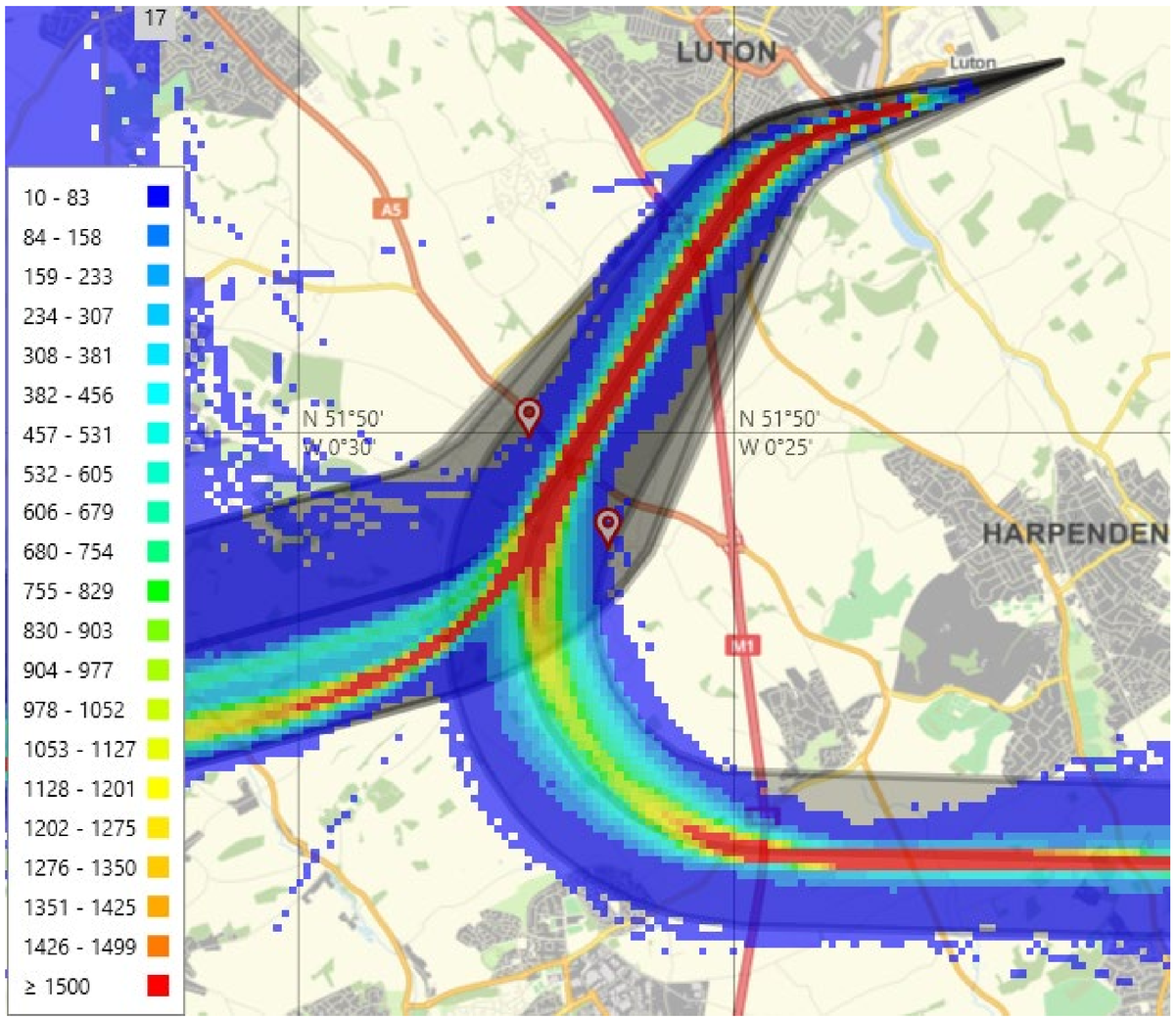
The graph below represents the average number of departures during the monitoring period. During the peak periods, local residents of Flamstead and Markyate may notice more aircraft. Peak periods were at 0600-0900, 1300-1500 and 2000-2100.

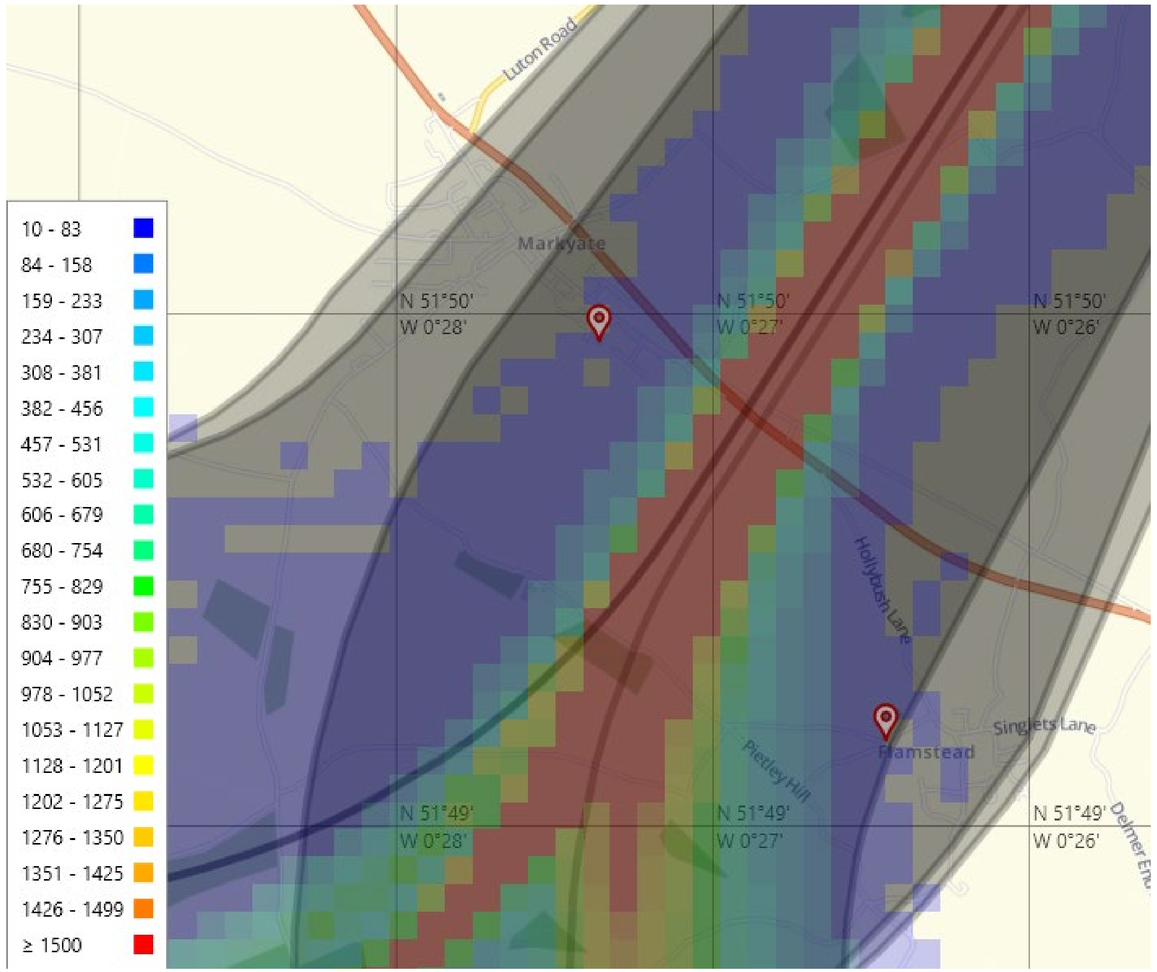
During the night period of 23:00 – 06:00, there was an average of 9 departures compared to 6 for the previous year, showing an increase in night time operations during the monitoring period.



Aircraft Tracks During the Monitoring Period

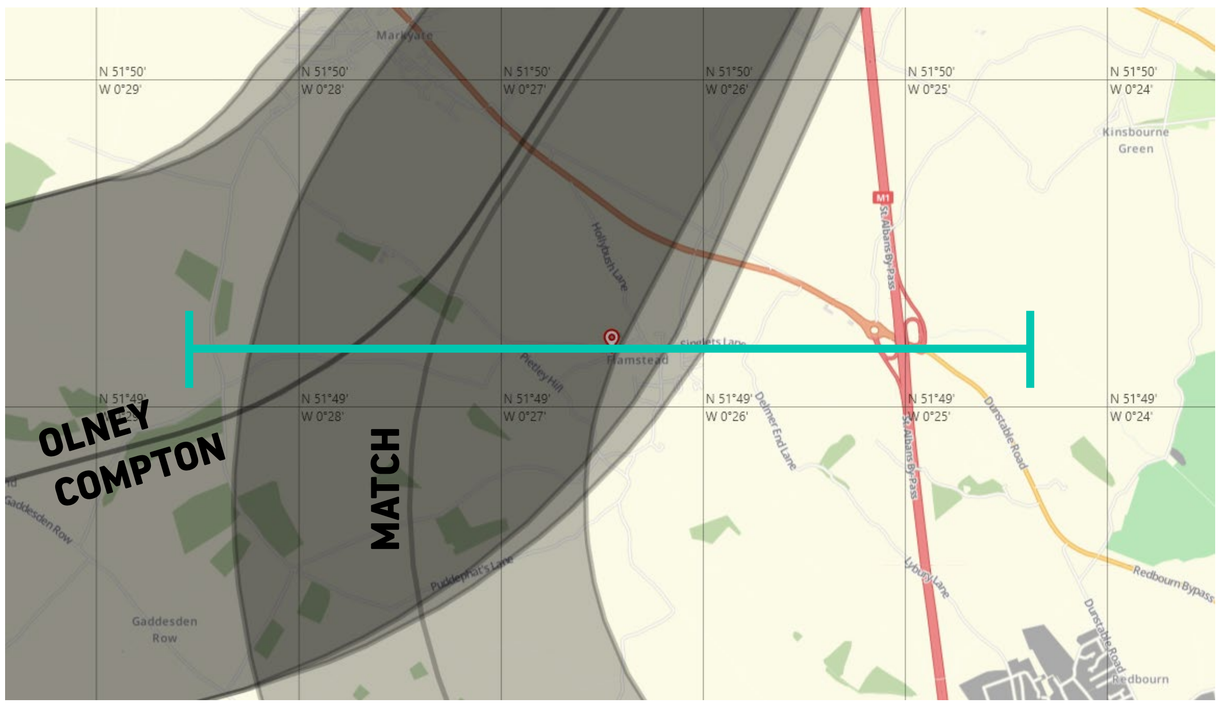
The heat maps below show the representative flight tracks that passed near the noise monitor terminals during the monitoring period. The red pinpoints indicate the locations of the noise monitors in Flamstead and Markyate.

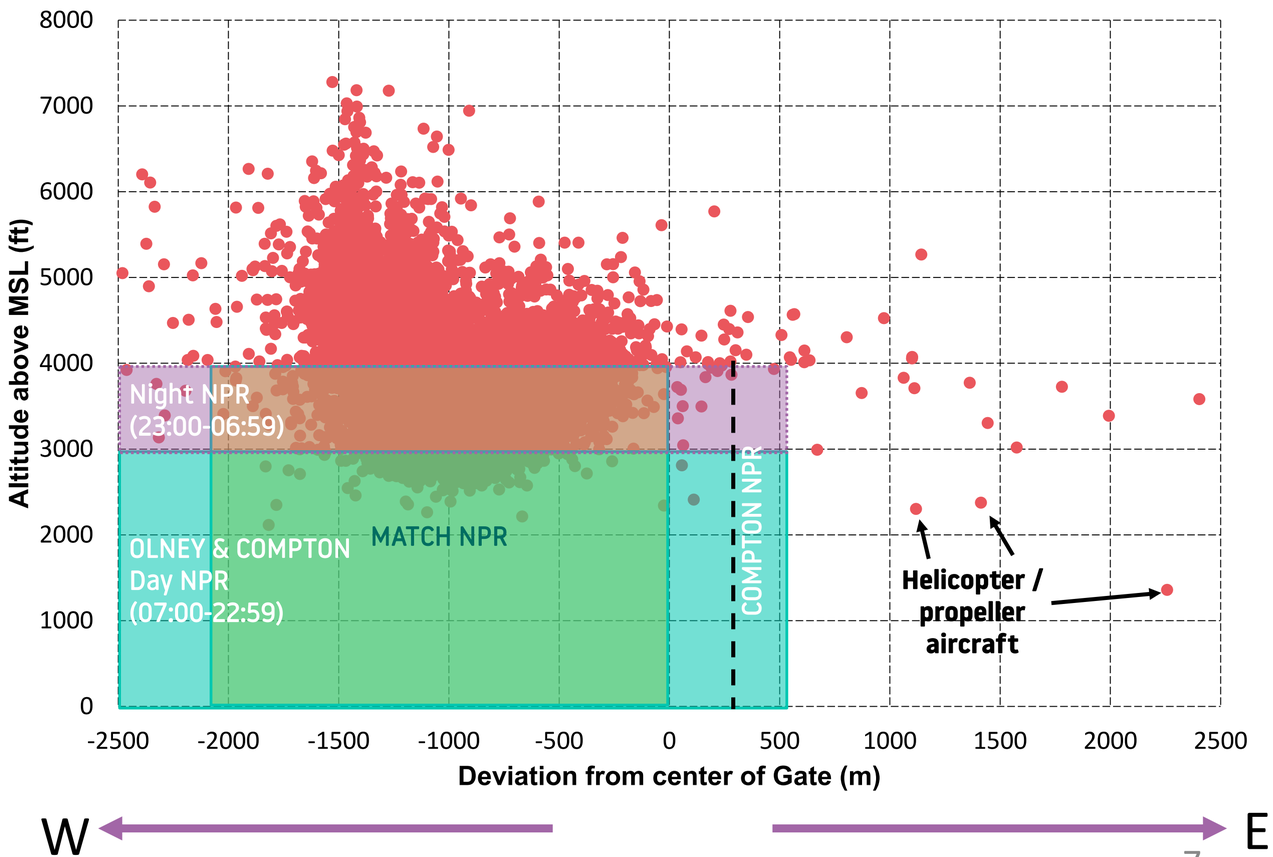




Flamstead Altitude Analysis During Monitoring Period

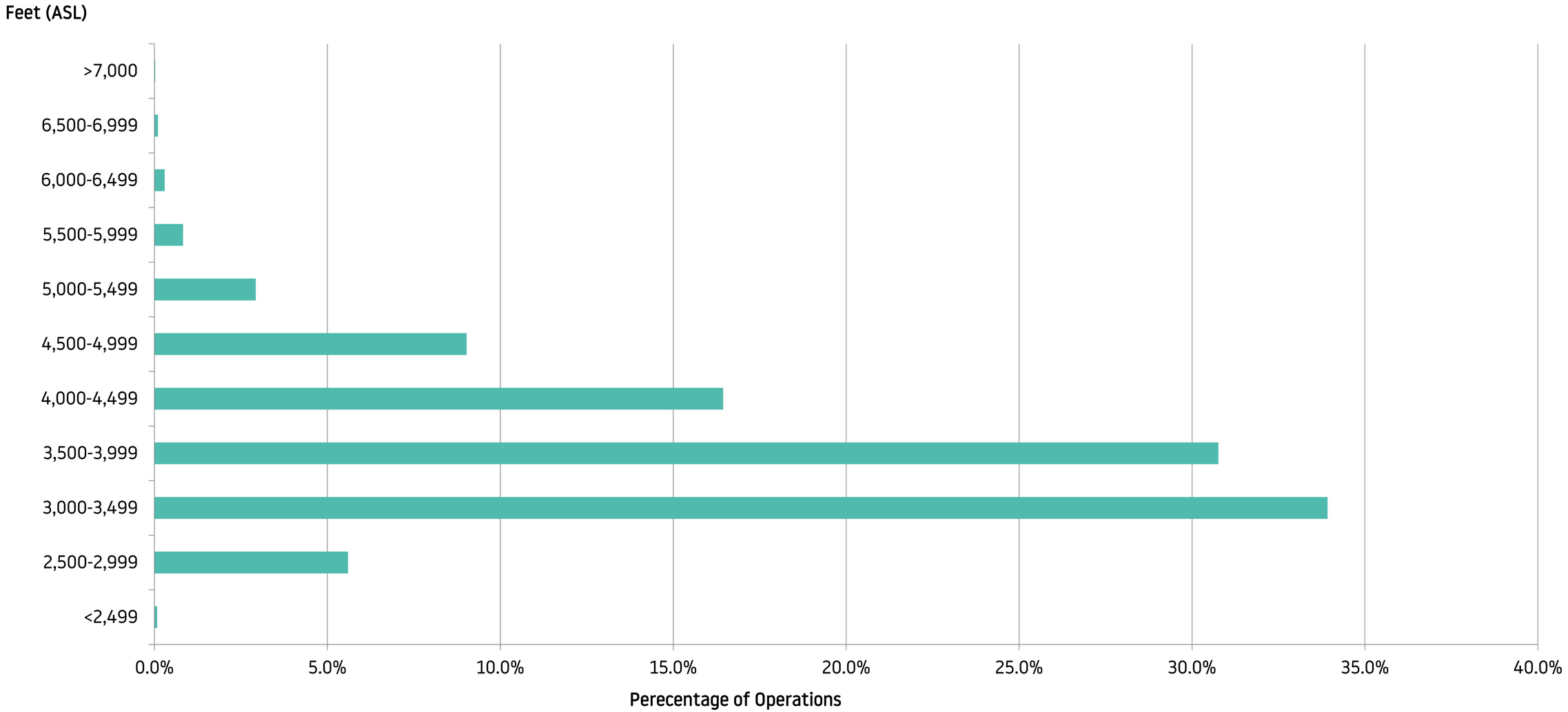
The altitude analysis for Flamstead shows the vertical and lateral dispersion of aircraft 2.5km either side of the noise monitor. The map below shows the 5km gate which is drawn across from west to east and will gather information about every aircraft passing through the gate area. The scatter graph below shows the distance and altitude of aircraft from the noise monitor during the monitoring period. The noise preferential routes (NPRs) are displayed by the shaded area. Departing aircraft must remain within the NPR until reaching release altitude of 3,000ft during the day or 4,000ft at night (4,000ft at all times for Match route). Most aircraft were within or above the NPR corridor when they reached near Flamstead. Therefore, local residents may see aircraft directly overflying Flamstead. There were 3 flights which flew to the east of Flamstead at a low altitude. These were helicopter and propeller aircraft which are not subject to NPR rule.





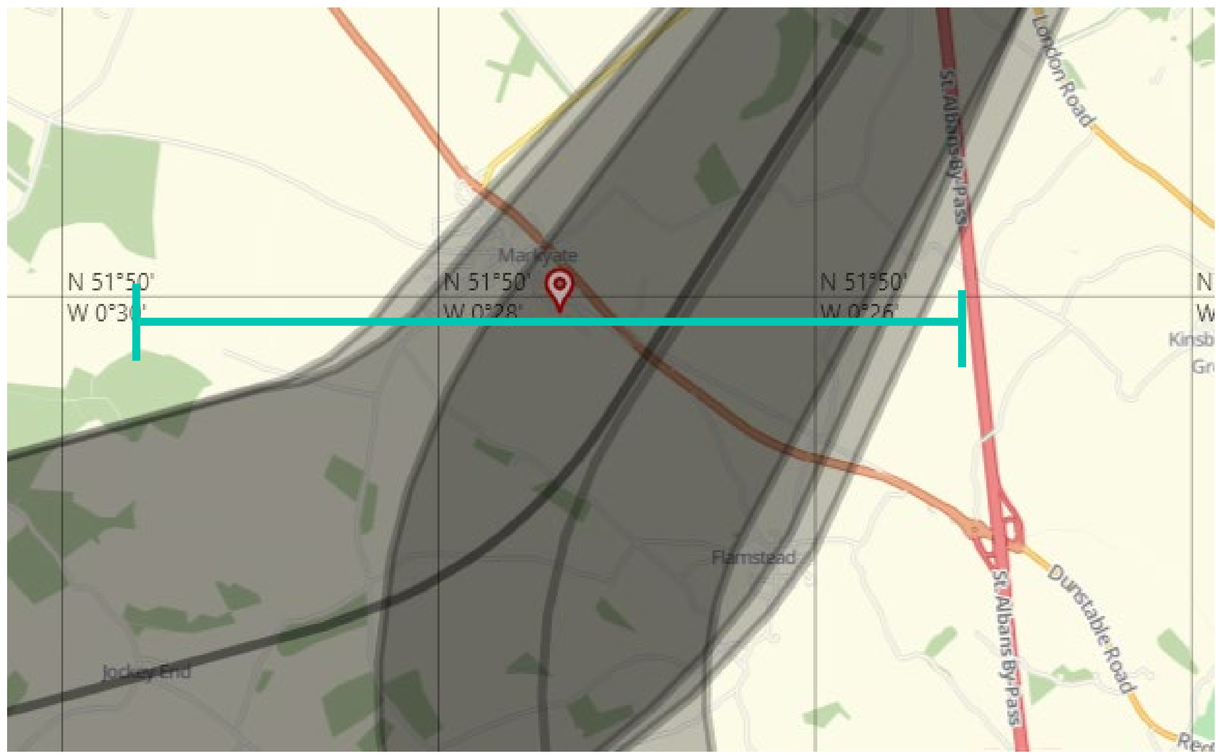
Flamstead Altitude Analysis During Monitoring Period

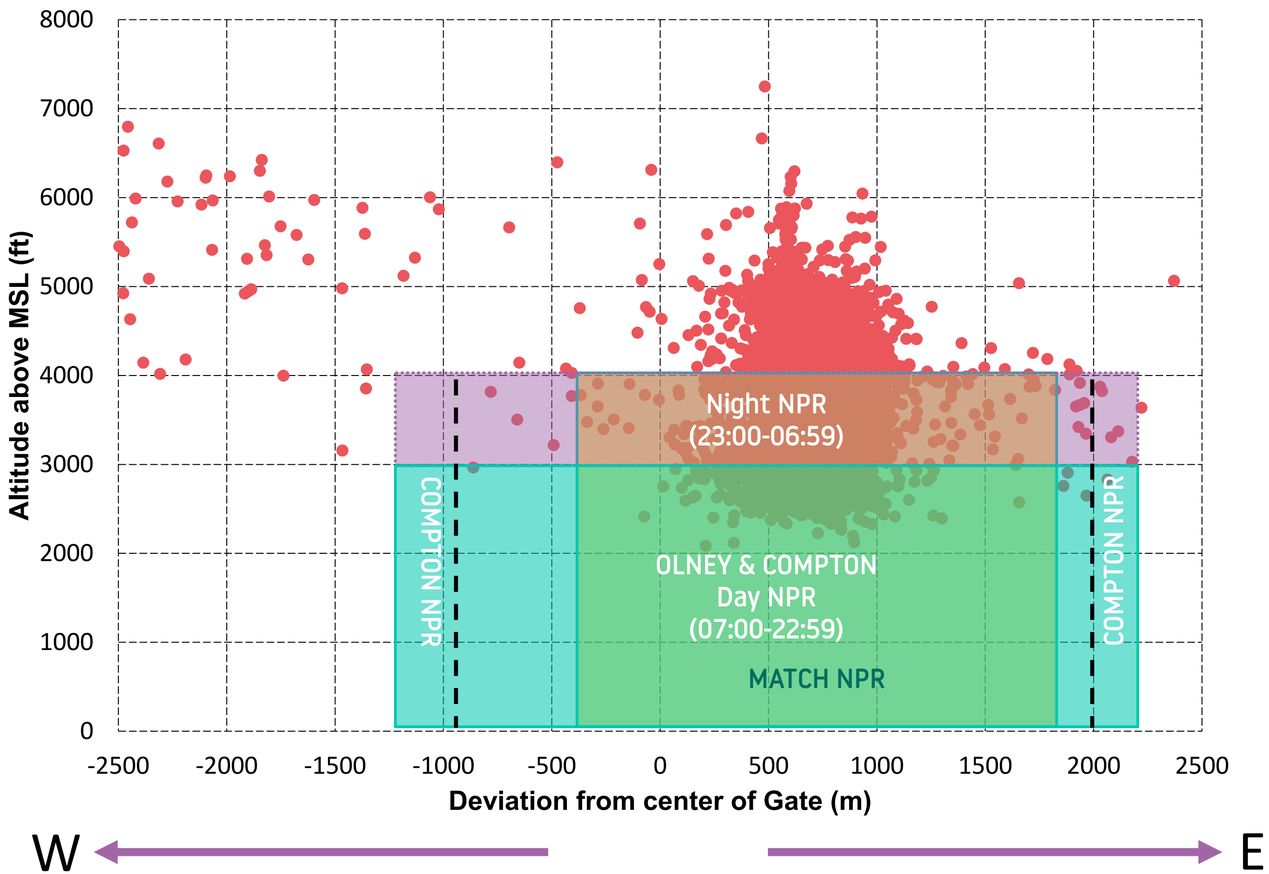
The average altitude of aircraft in this area was 3,764 feet ASL (3,278 feet above ground level). The bar chart shows that 65% of flights were between 3,000-3,999 feet above sea level (ASL) and most flights (94%) were above 3,000 feet ASL.



Markyate Altitude Analysis During Monitoring Period

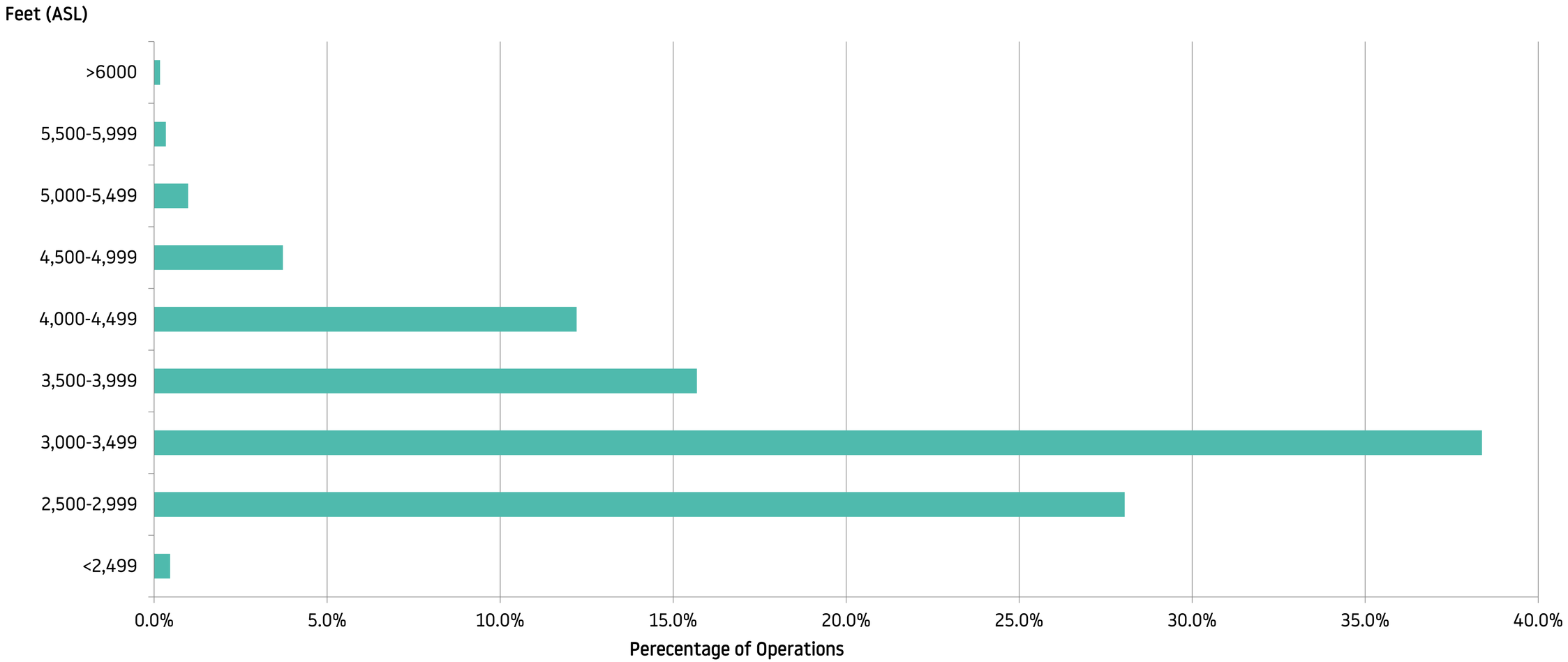
The altitude analysis for Markyate shows the vertical and lateral dispersion of aircraft 2.5km either side of the noise monitor. The map below shows the 5km gate which is drawn across from west to east and will gather information about every aircraft passing through the gate area. The scatter graph below shows the distance and altitude of aircraft from the noise monitor during the monitoring period. The noise preferential routes (NPRs) are displayed by the shaded area. Departing aircraft must remain within the NPR until reaching release altitude of 3,000ft during the day or 4,000ft at night (4,000ft at all times for Match route). Most aircraft were within or above the NPR corridor when they reached near Markyate. Therefore, local residents may see aircraft directly overflying Markyate.





Markyate Altitude Analysis During Monitoring Period

The average altitude of aircraft in this area was 3,397 feet ASL (2,957 feet above ground level). The bar chart shows that 66% of flights were between 2,500-3,499 feet above sea level (ASL) and 72% of flights were above 3,000 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).

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 data need to be excluded from the analysis for weather reason.

During the monitoring period in Flamstead, the noise monitoring terminal collected readings from 14,045 aircraft. During the period, there were total of 17,764 westerly departures. Of those departures, 17,649 flights flew within 2.5km of Flamstead as shown on the previous page (17,624 within 2km; 7,098 within 1km).

For Markyate, the noise monitoring terminal collected readings from 12,663 aircraft. During the period, there were total of 17,169 westerly departures. 17,052 flights flew within 2.5km of Markyate as shown on the previous page (17,024 within 2km; 16,771 within 1km).

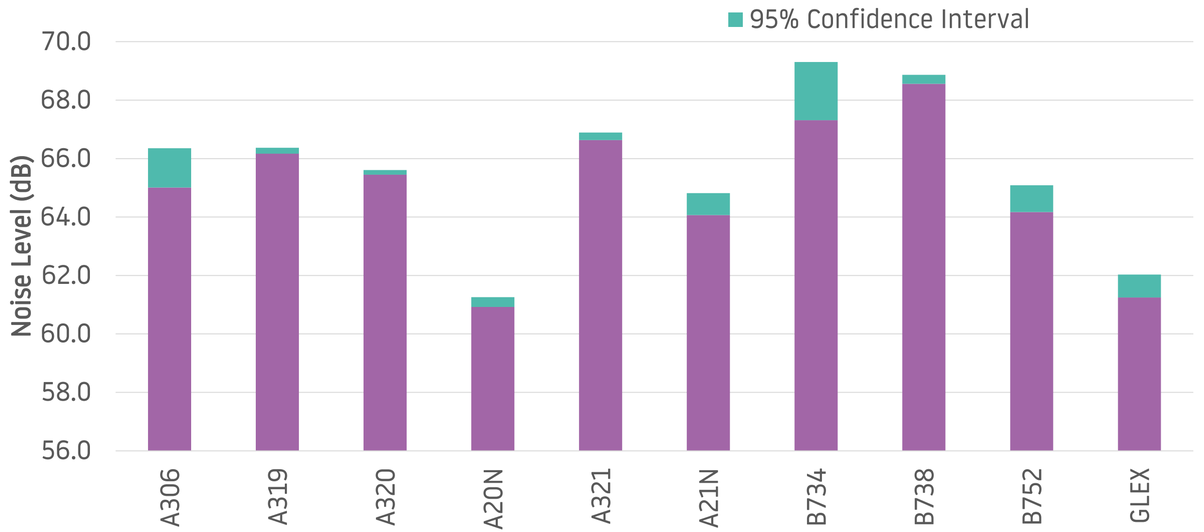
Unfortunately, there were internal power outages to the noise monitors in which the noise monitors were not able to collect any noise reading during the outage. There were total of 113 hours of outage in Flamstead and 245 hours in Markyate.

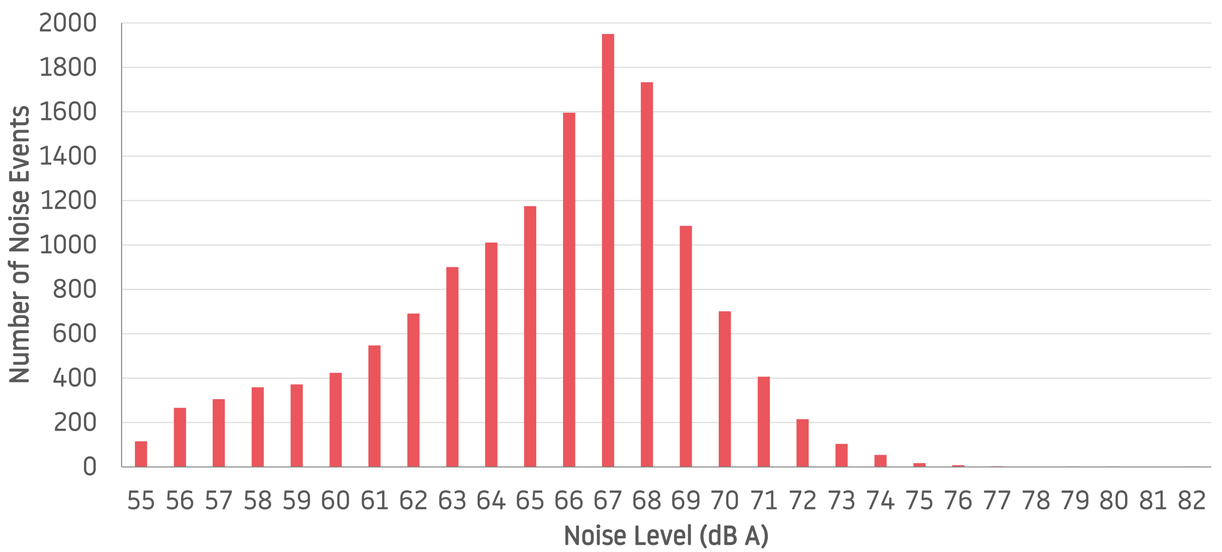
It is noteworthy that the noise monitor may not be able to record every aircraft noise event if the aircraft noise level is below ambient background noise. Therefore, there may be a difference between the number of actual air transport movements and number of aircraft noise events collected during the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

Flamstead 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 are shown on this page.

Aircraft Type	Number of movements	Average Noise (dB)
A306	127	65.7
A319	2,373	66.3
A320 CEO	4,792	65.5
A20N (A320 NEO)	609	61.1
A321 CEO	1,983	66.8
A21N (A321 NEO)	186	64.4
B734	61	68.3
B738	1,611	68.7
B752	180	64.6
GLEX	313	61.6





The average noise in Flamstead is 65.3dB, based on a sample size of 14,045. 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 has an average noise of 61.1dB in Flamstead. The A320 NEO and A321 NEO produced less noise than A320 and A321 CEOs. The new NEO aircraft are advertised as more fuel efficient and quieter aircraft by the aircraft manufacturer. The B734 and B738 continued to be the noisiest aircraft type at Flamstead during the monitoring period.

*The noise results shown in the analysis are only for those aircraft types that recorded more than 140 events per aircraft (A306 and B734 included for comparison).

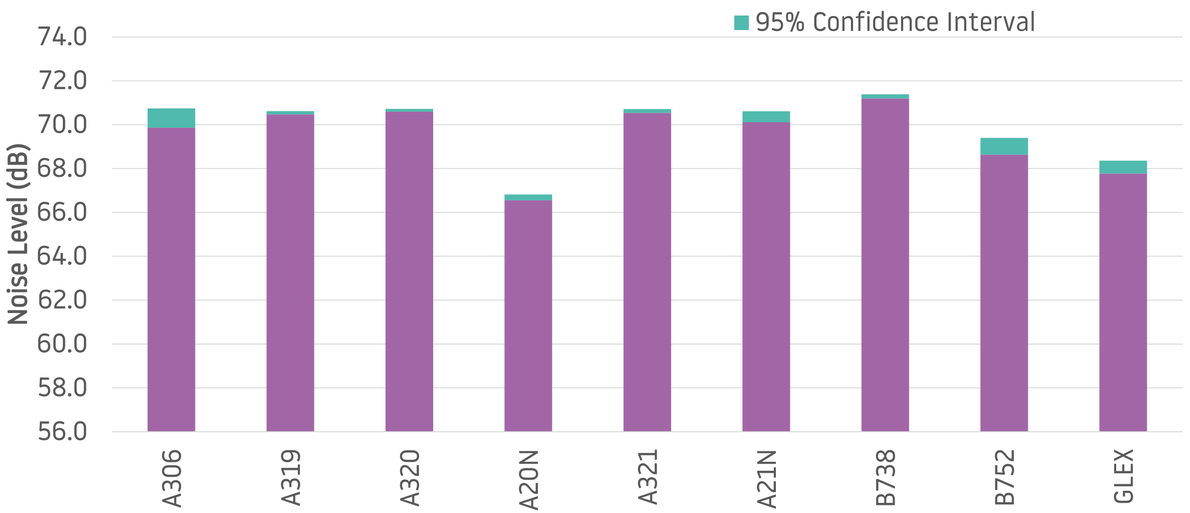
Markyate Noise Results During Monitoring Period

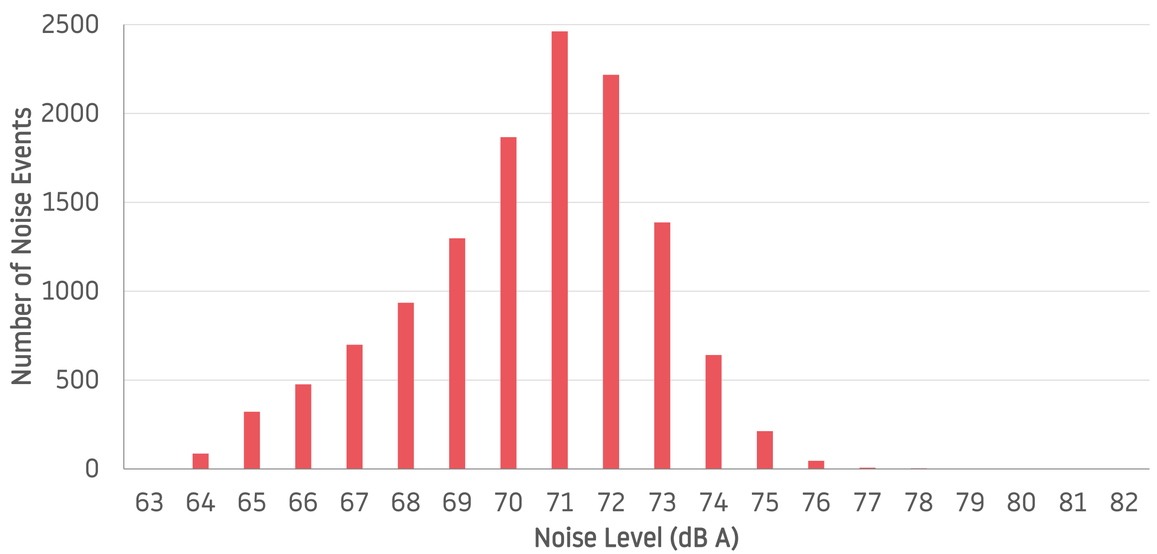
During the monitoring period, noise recording samples were gathered from the most popular aircraft types at London Luton Airport*. The summary of the results are shown on this page.

Aircraft Type	Number of movements	Average Noise (dB)
A306	147	70.3
A319	2,332	70.5
A320 CEO	4,600	70.7
A20N (A320 NEO)	427	66.7
A321 CEO	2,023	70.6
A21N (A321 NEO)	180	70.4
B738	1,803	71.3
B752	155	69.0
GLEX	184	68.1

The average noise in Markyate is 70.4dB. This is based on a sample size of 12,663. 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 has an average noise of 70.7dB in Markyate, higher noise level than the noise recorded in Flamstead. This was expected as Markyate is closer to the runway and aircraft would likely be at a lower altitude when reaching Markyate (shown in previous section). The same as Flamstead, the A320 NEO and A321NEO produced less noise than A320 and A321 CEOs.

*The noise results shown in the analysis are only for those aircraft types that recorded more than 120 events per aircraft.





Conclusion

- During the monitoring period, the airport was using westerly operations for 74% of the time, this is less than the five year average of this time period.

- The main aircraft types operating at London Luton Airport are A320 and A319 which produced an average noise of 65.5dB and 66.3dB respectively in Flamstead; and 70.7dB and 70.5dB in Markyate. 5.7% of the noise events recorded in Flamstead were created by the newer generation aircraft, A320 NEO and A321 NEO, registering average noise events of 61.1dB and 64.4dB respectively, quieter than the Airbus CEO departures.

- The average altitude of aircraft in Flamstead is 3,764 feet above sea level, and as Flamstead is already approximately 486 feet above sea level, aircraft will typically be 3,278 feet above ground level in this area.

- For Markyate, the average altitude of aircraft is 3,397 feet above sea level, and as Markyate is already approximately 440 feet above sea level, aircraft will typically be 2,957 feet above ground level in this area.

- Above Flamstead and Markyate aircraft are typically between 3,000-3,999 feet during the monitoring period. This accounted for 65% of all aircraft in Flamstead and 54% in Markyate. We also saw 30% and 18% of aircraft achieve altitudes above 4,000 feet in Flamstead and Markyate respectively.

- Most westerly departure aircraft shown in the altitude analysis flew within or above the NPR corridor.

- During the monitoring period, 88 aircraft (both westerly and easterly) were investigated as part of the Noise and Track violation scheme. 21 aircraft was 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 Flamstead and Markyate.

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.

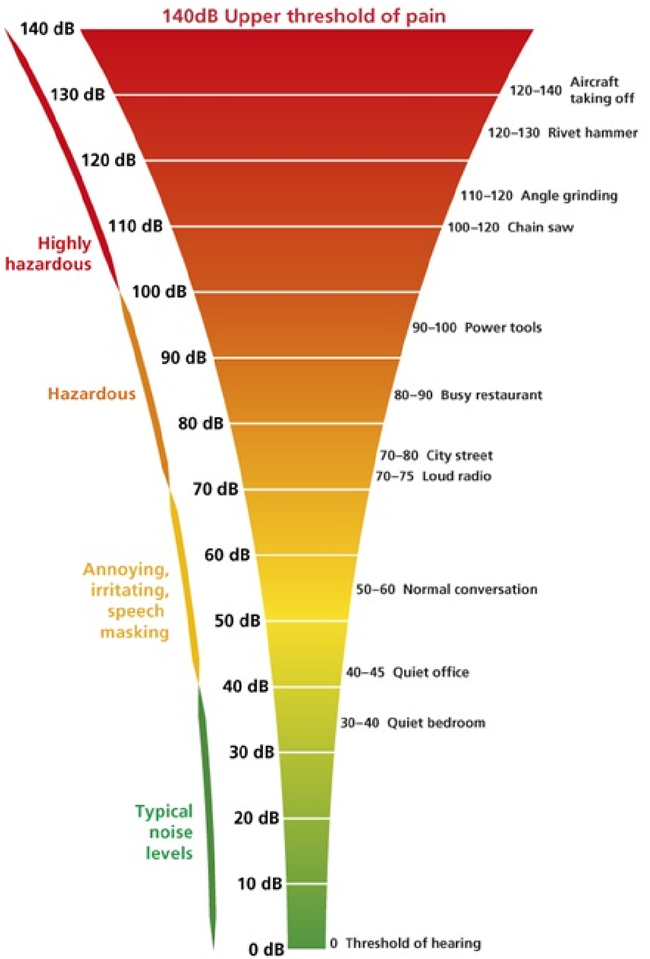
Gate Analysis: A gate which is drawn across an area and will gather information about every aircraft passing through the gate area.

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