

Community Noise Report

Flamstead and Cheverell's Green

October – December 2020



Version 1.0

Introduction

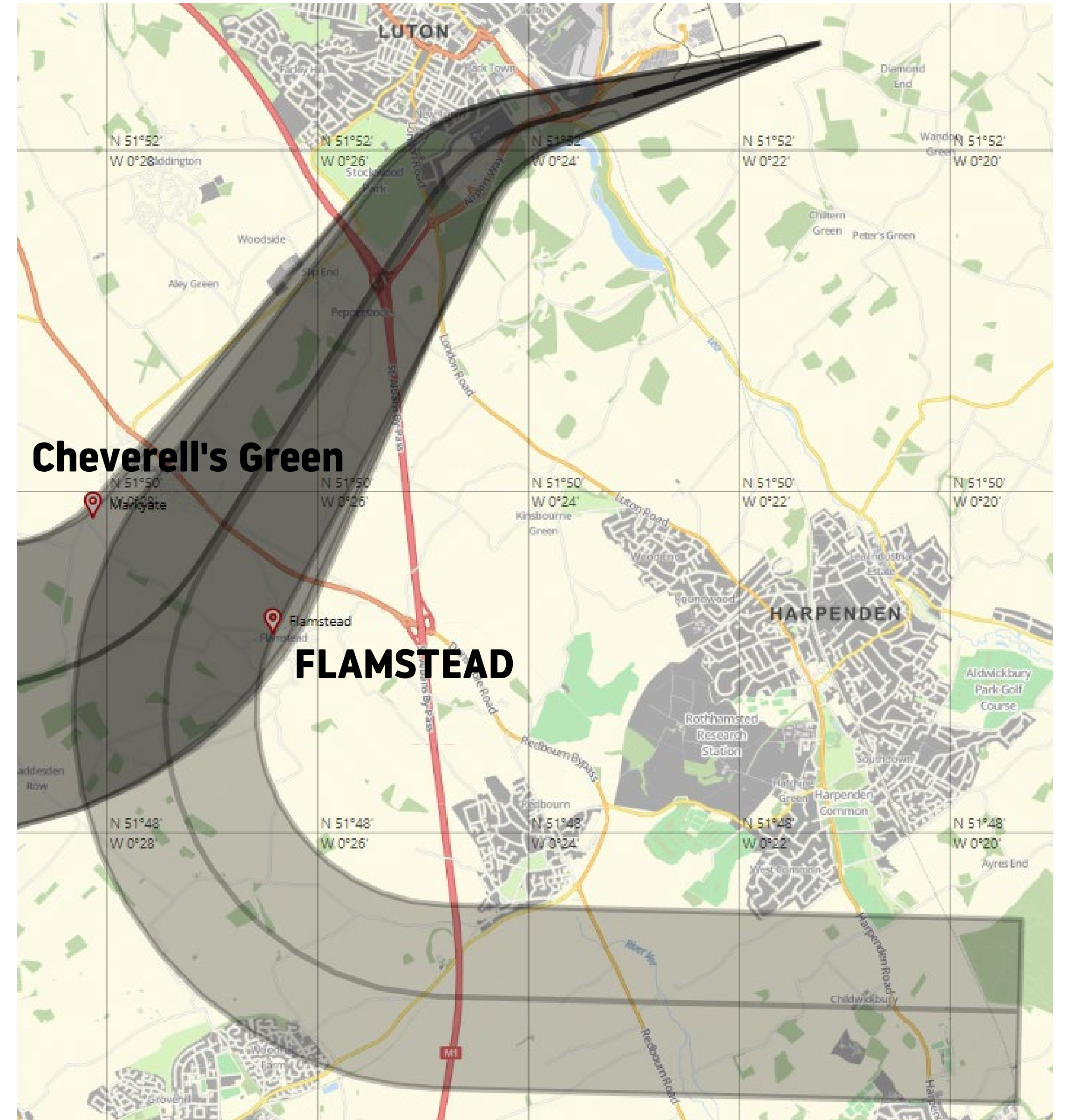
As part of the ongoing noise monitoring programme, London Luton Airport deployed portable noise monitoring terminals in Flamstead and Cheverell's Green.

The purpose of the monitoring programme is to understand the typical noise levels created in the local community. For Flamstead and Cheverell's Green, 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 486-545 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 30th September and 13th December 2020 whereas the noise monitor in Cheverell's Green was in place between 7th October and 13th December 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.

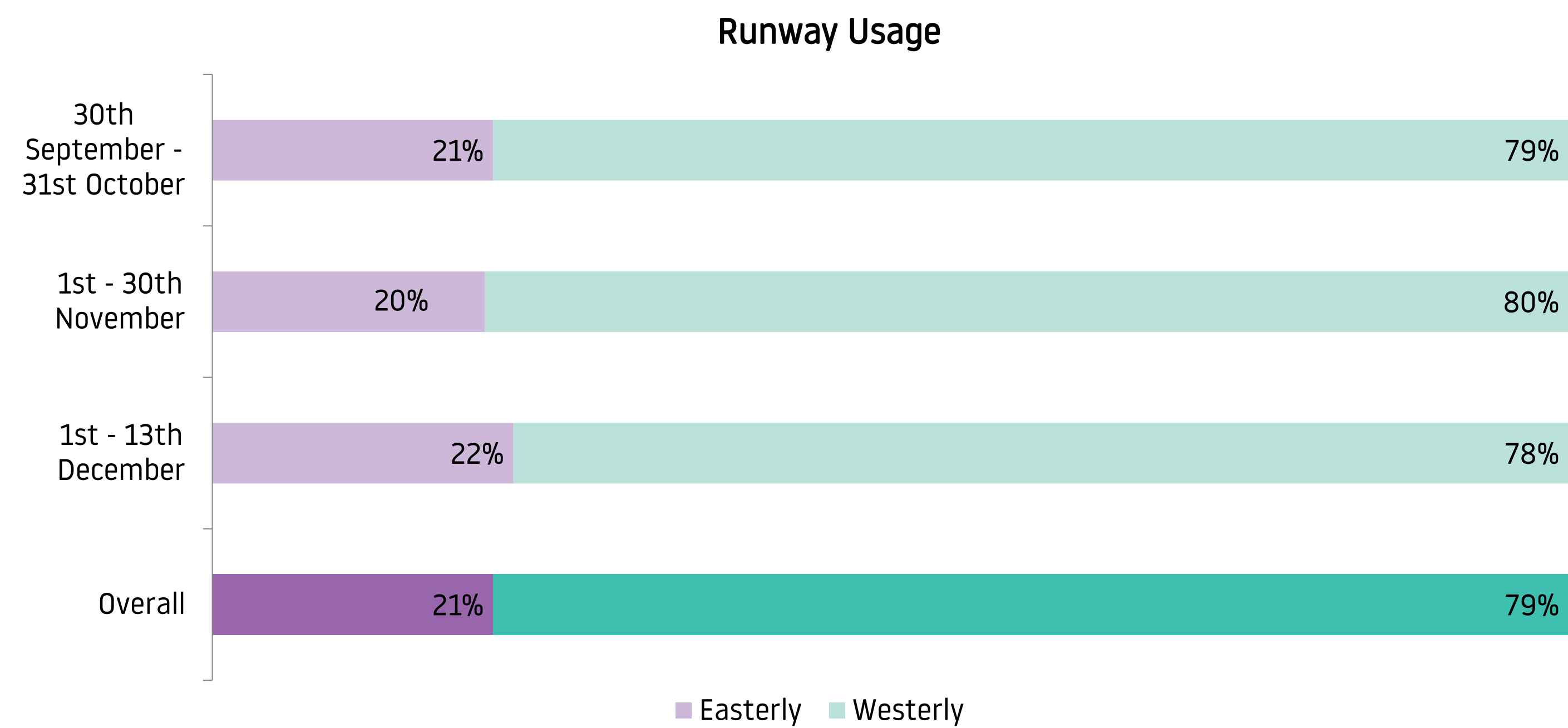


LLA Operations During the Monitoring

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.

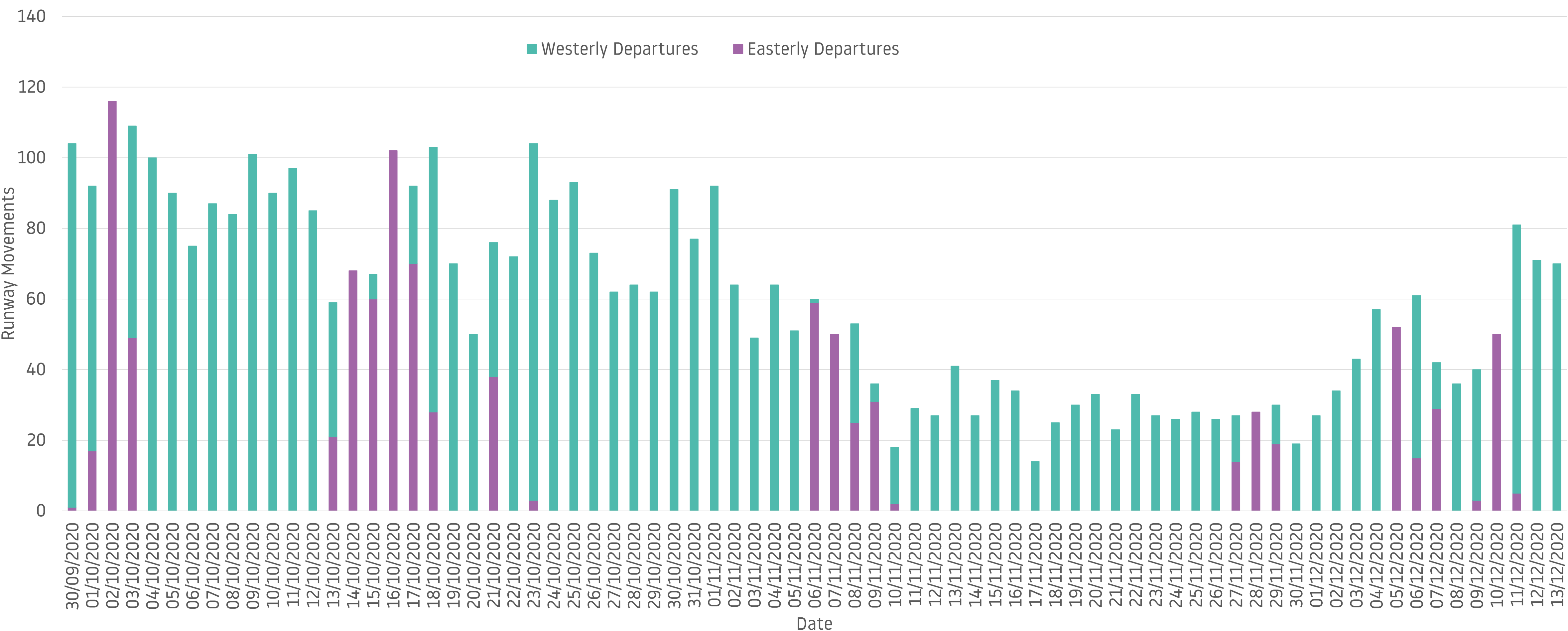
During the period of monitoring, the direction of operation was 21% Easterly and 79% Westerly. The 5 year average for this time of year is 28% Easterly vs 72% Westerly.

4,477 aircraft departed on westerly SIDs operated from the airport whilst the monitors were located in Flamstead and Cheverell's Green.



Daily Movements During Monitoring Period

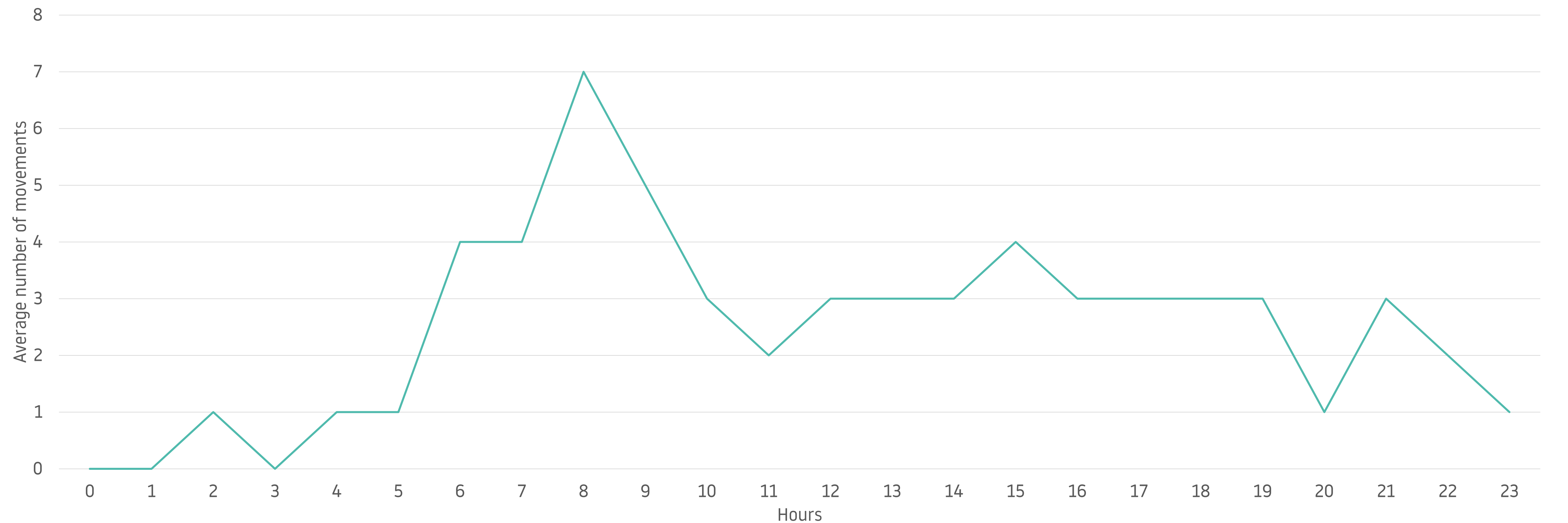
The chart below shows the number of daily departures that passed the noise monitor. Due to the location of Flamstead and Cheverell's Green, all flights that departed on our Standard Instrument Departure (SID) routes during westerly operations would have flown passed the monitors. During the monitoring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



Operations During the Monitoring Period

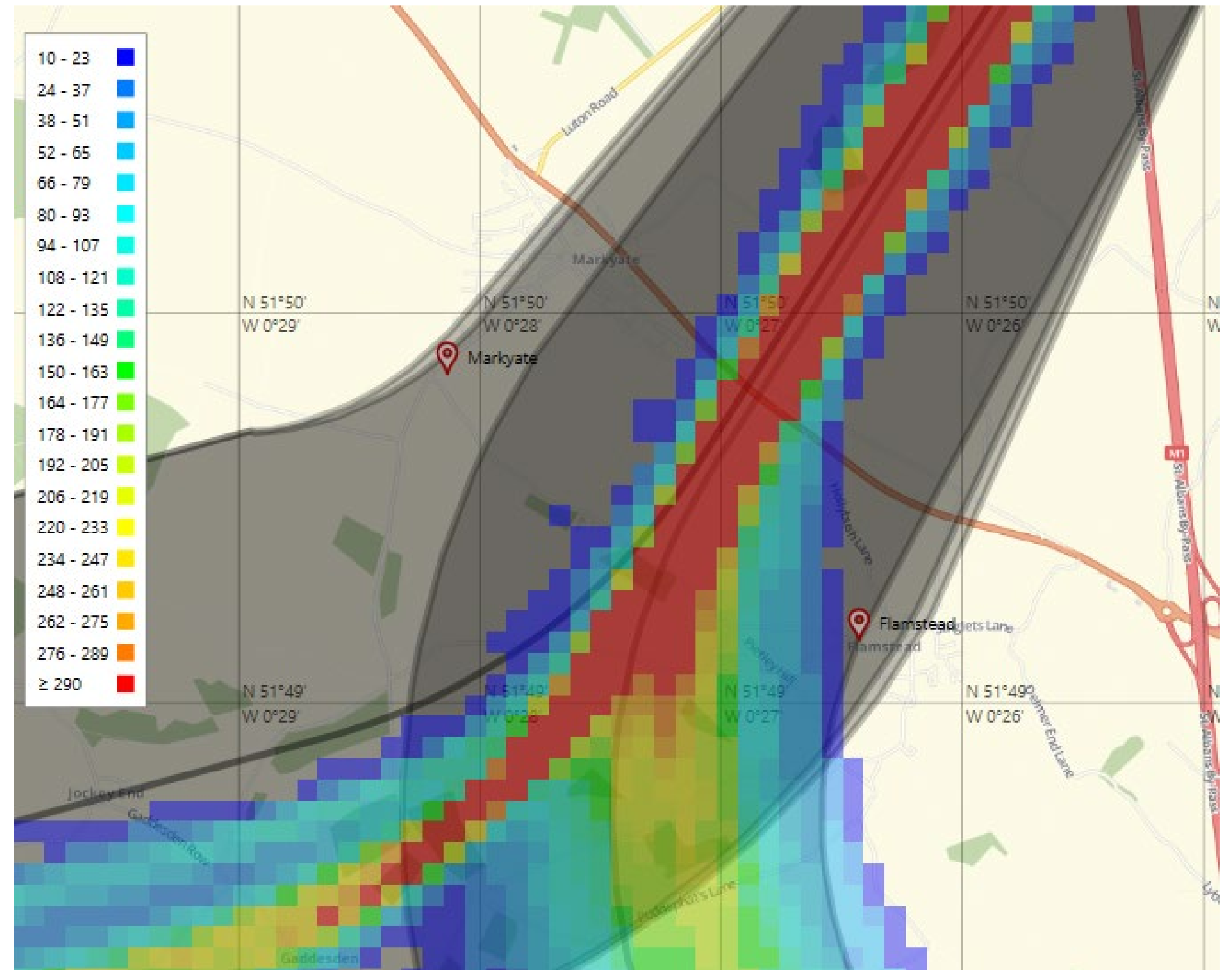
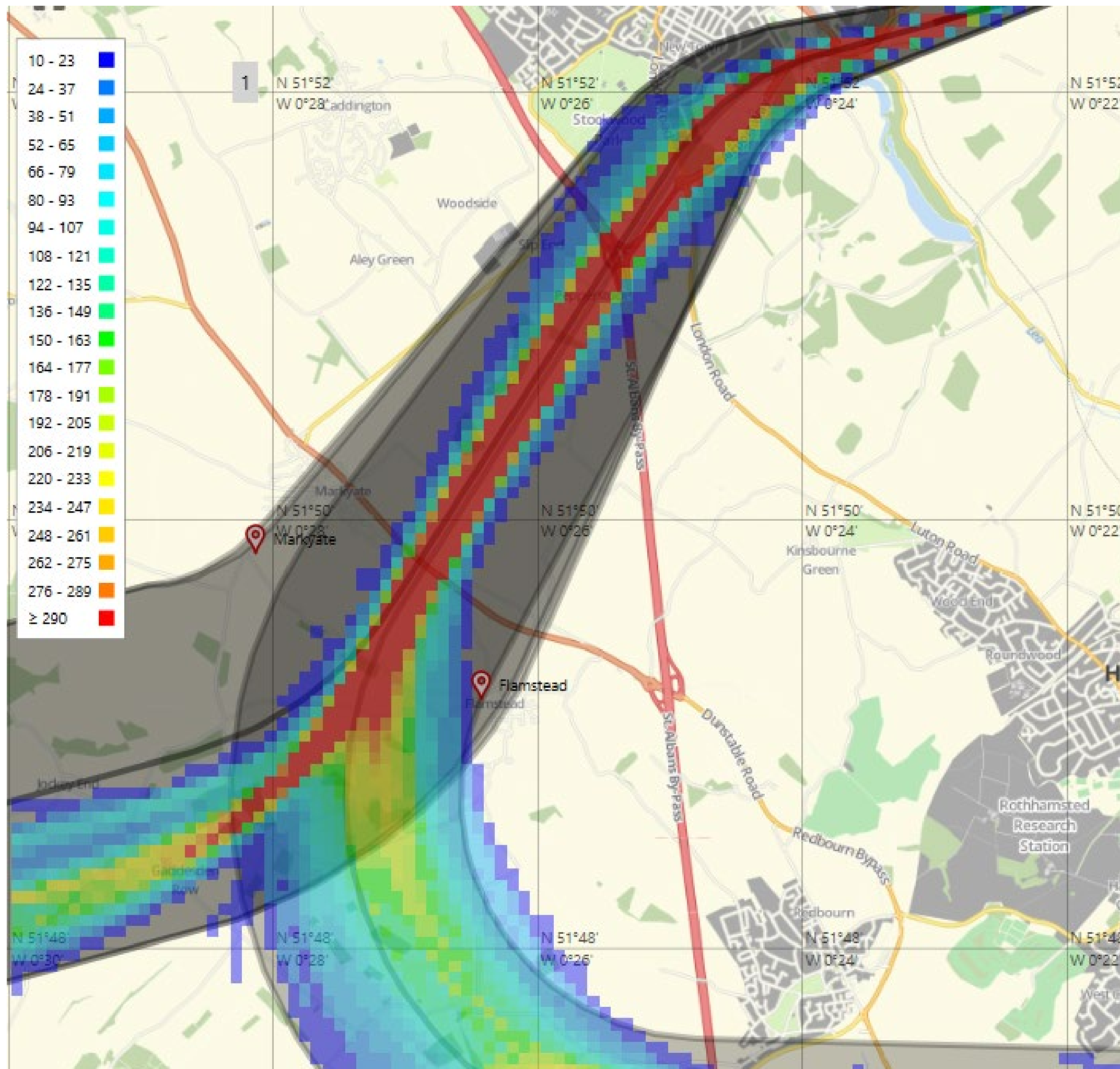
The graph below represents the average number of departures during the monitoring period. During the peak period, generally in the morning, local residents of Flamstead and Cheverell's Green may notice more aircraft.

During the night period of 23:00 – 06:00, there was an average of 4 departures compared to 6 for the previous year, showing a decrease in night time operations during the monitoring period likely to be linked to the COVID pandemic.



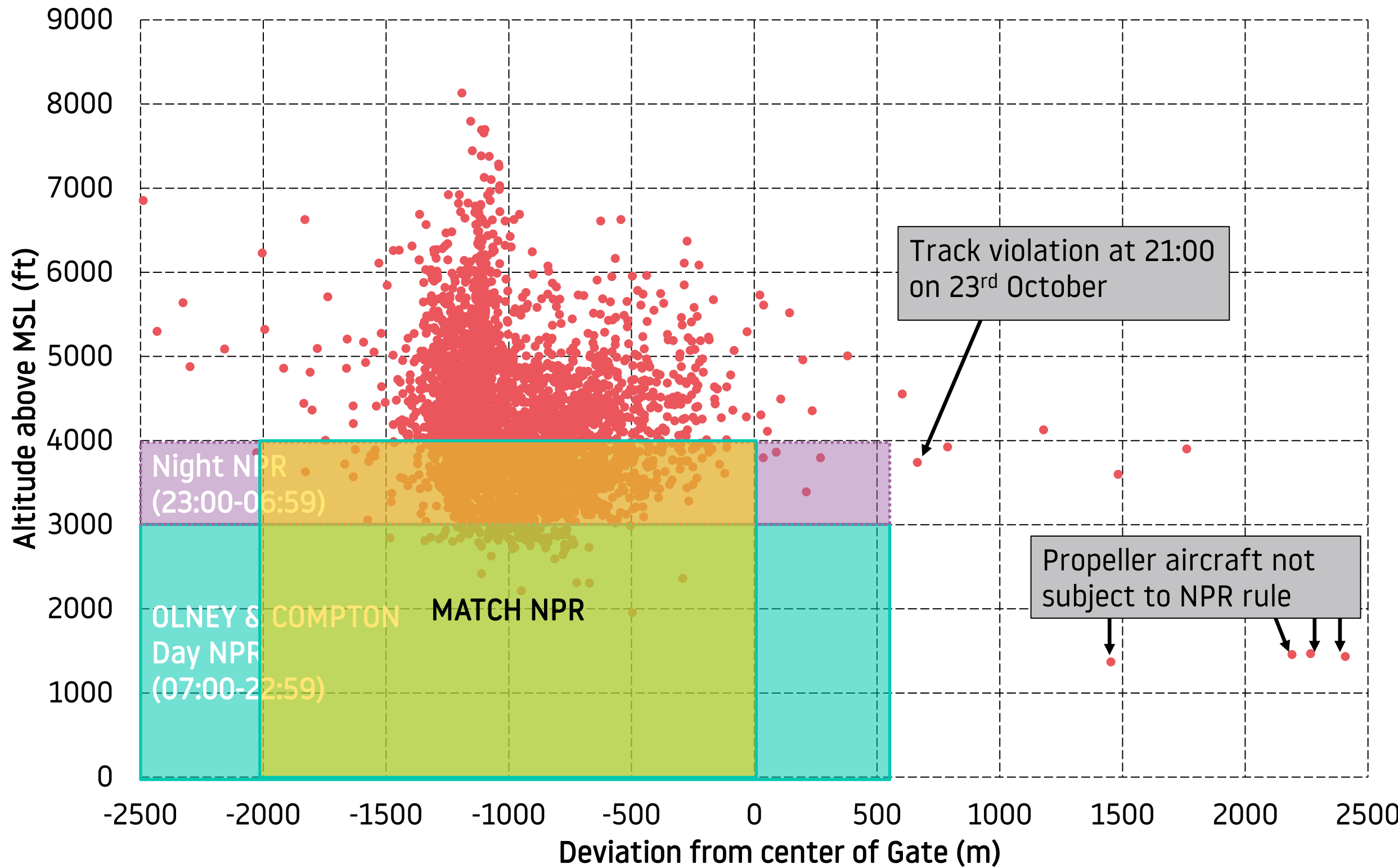
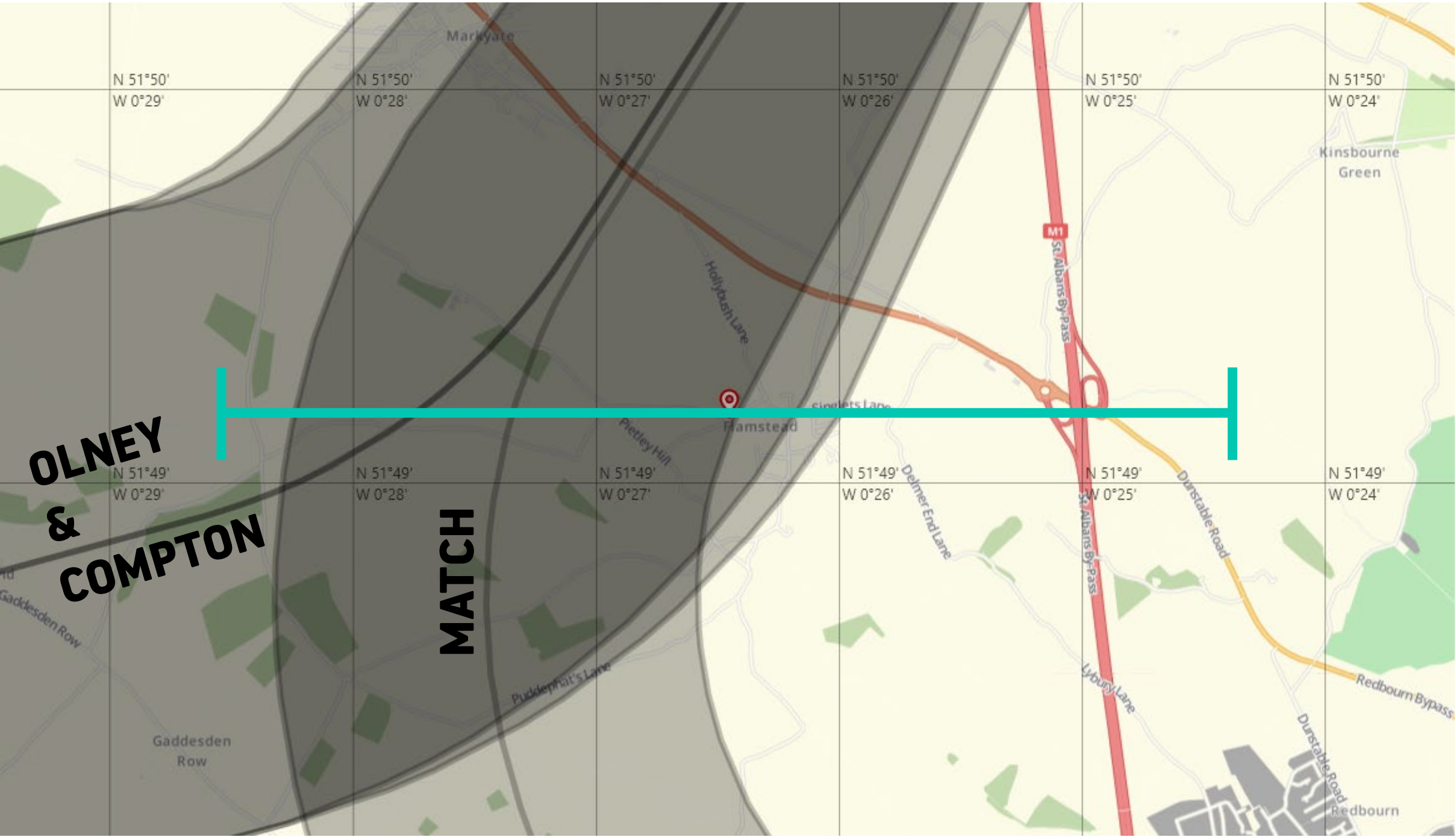
Aircraft Tracks During the Monitoring Period

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 Cheverell's Green.



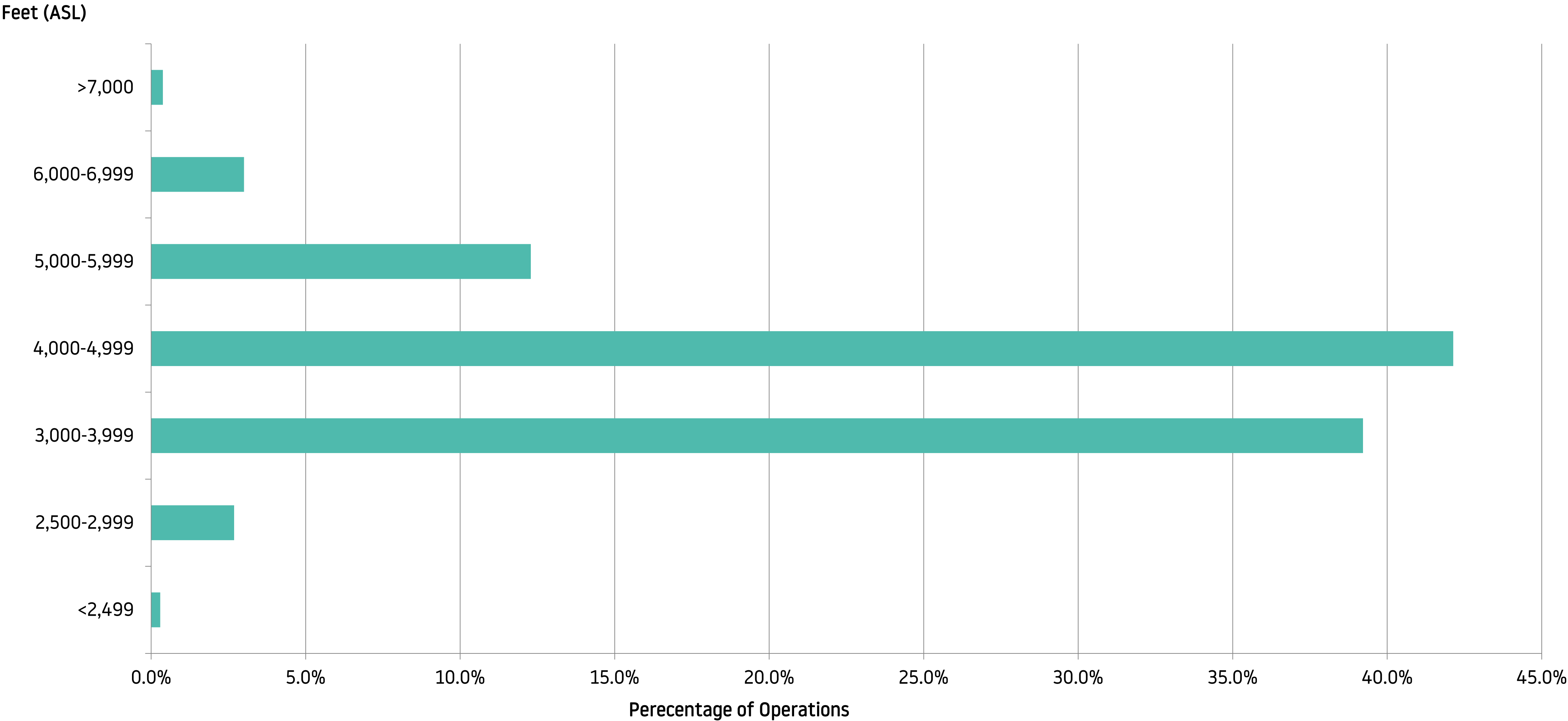
Flamstead Altitude Analysis During Monitoring Period

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 four flights which flew to the east of Flamstead at a low altitude below 3,000ft. These were propeller aircraft (DA42 and PC12 type) which is not subject to NPR rule due to its take off weight. Moreover, there was a track violation that a private aircraft (Gulfstream 4) flew outside the MATCH NPR corridor.



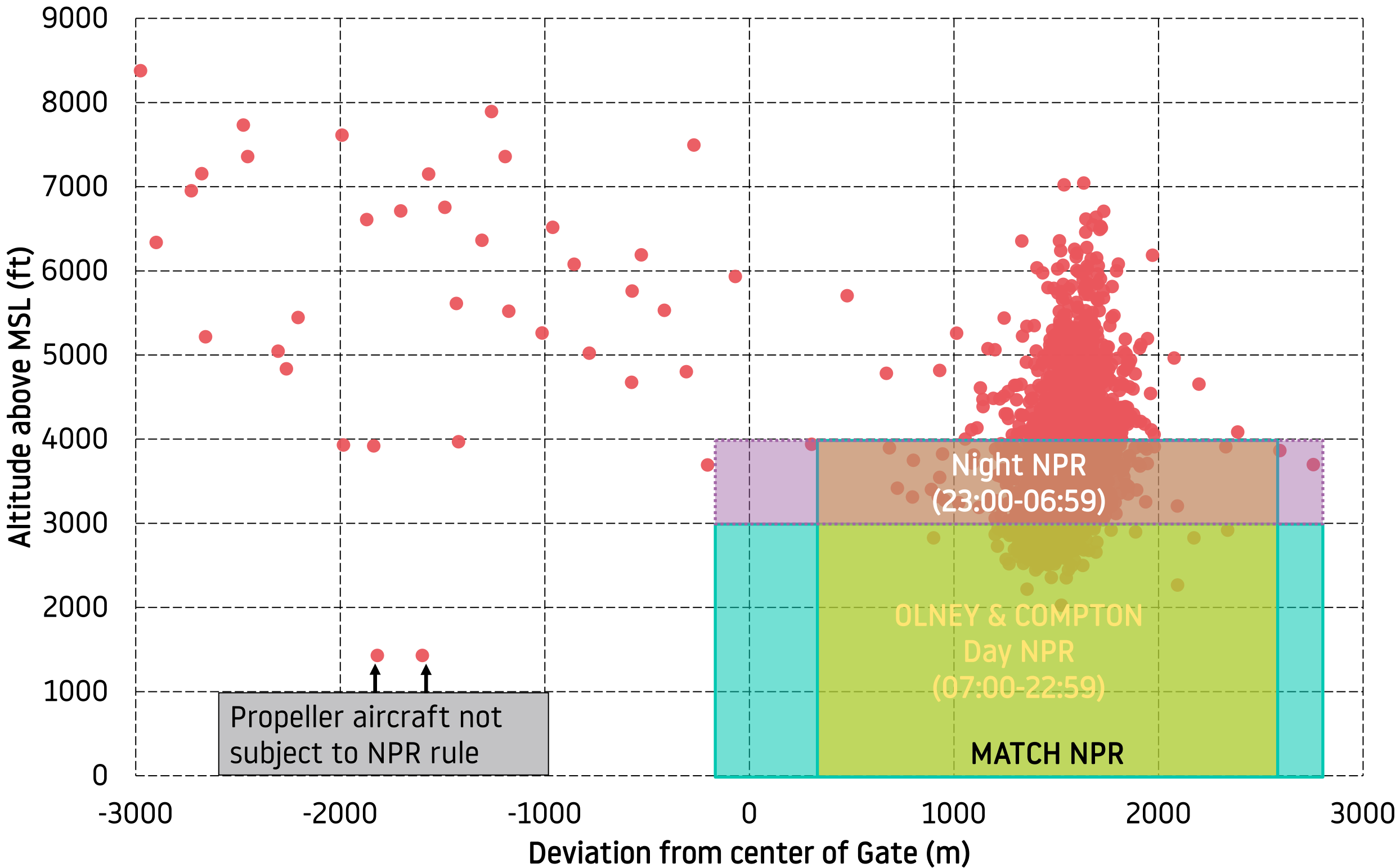
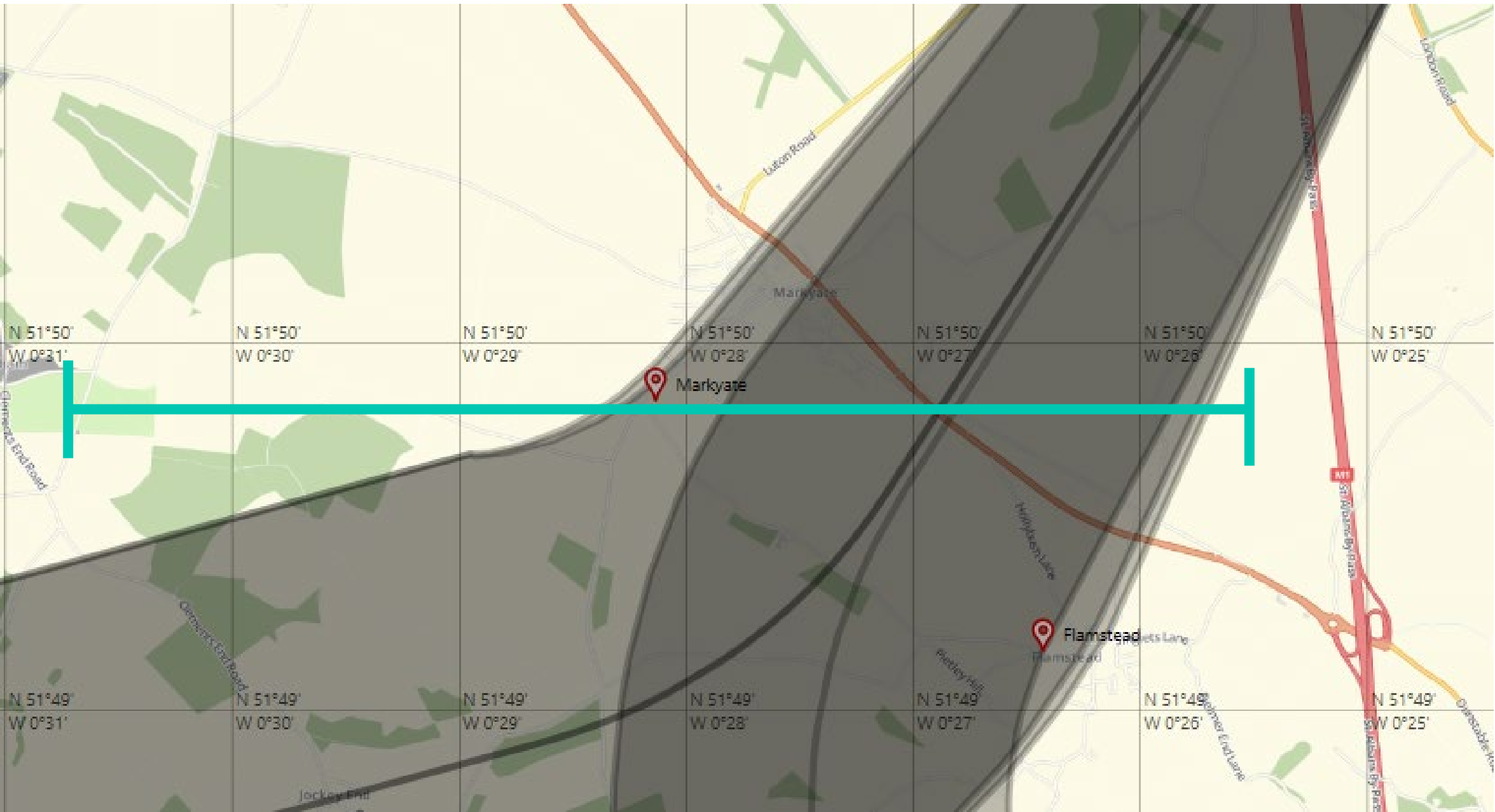
Flamstead Altitude Analysis During Monitoring Period

The average altitude of aircraft in this area was 4,249 feet ASL (3,763 feet above ground level). The bar chart shows that 42% of flights were between 4,000-4,999 feet above sea level (ASL) and over half of the flights (58%) were above 4,000 feet ASL.



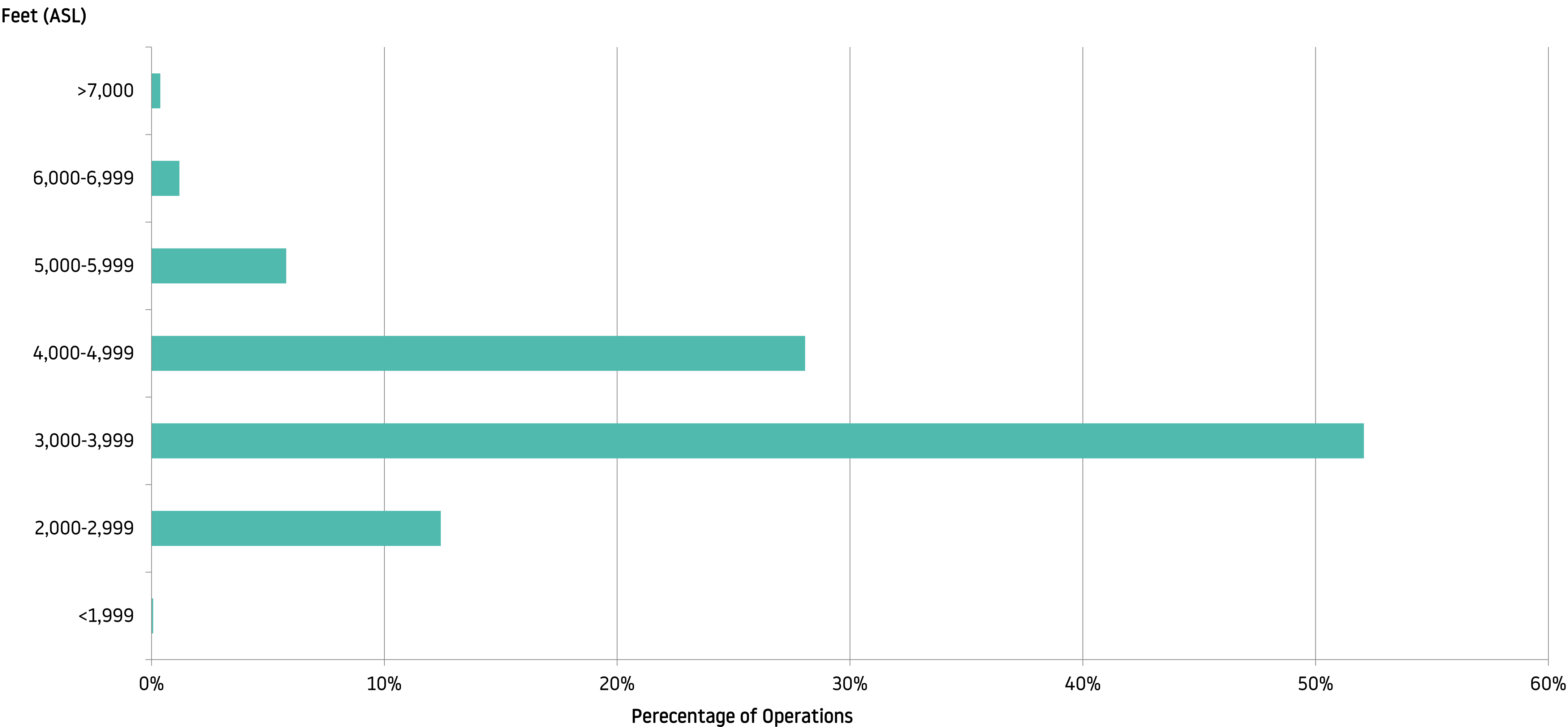
Cheverell's Green Altitude Analysis

The altitude analysis for Cheverell's Green 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 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 Cheverell's Green. At this noise monitor location, most aircraft are approx. 1.5km to the east, where the NPR centrelines are aligned. This can be seen by the red dots on the scatter chart below. Again, there were propeller aircraft which flew outside the NPR corridor and not subject to NPR rule due to their take off weight. They flew at 1.5km to the west of the noise monitor, at height of 1,400ft.



Cheverell's Green Altitude Analysis

The average altitude of aircraft in this area was 3,823 feet ASL (3,278 feet above ground level). The bar chart shows that over half of the flights were between 3,000-3,999 feet above sea level (ASL) and 35% of flights were above 4,000 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, 349 readings need to be excluded from the analysis for weather reason.

During the monitoring period in Flamstead, the noise monitoring terminal collected readings from 2,478 aircraft. During the period, there were total of 4,477 westerly departures. Of those departures, 3,427 flights flew within 2.5km of Flamstead as shown on the previous page (3,417 within 2km; 1,477 within 1km).

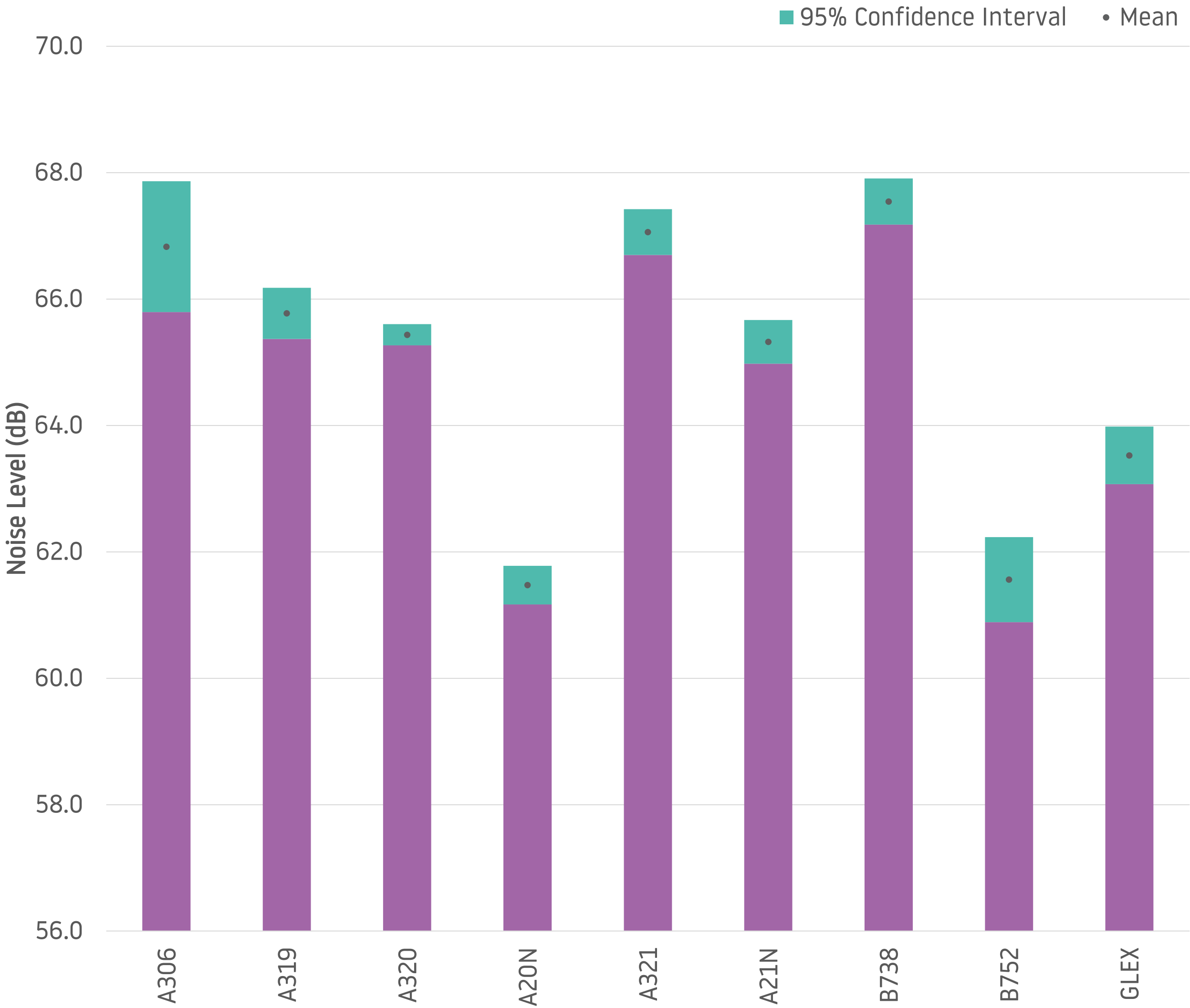
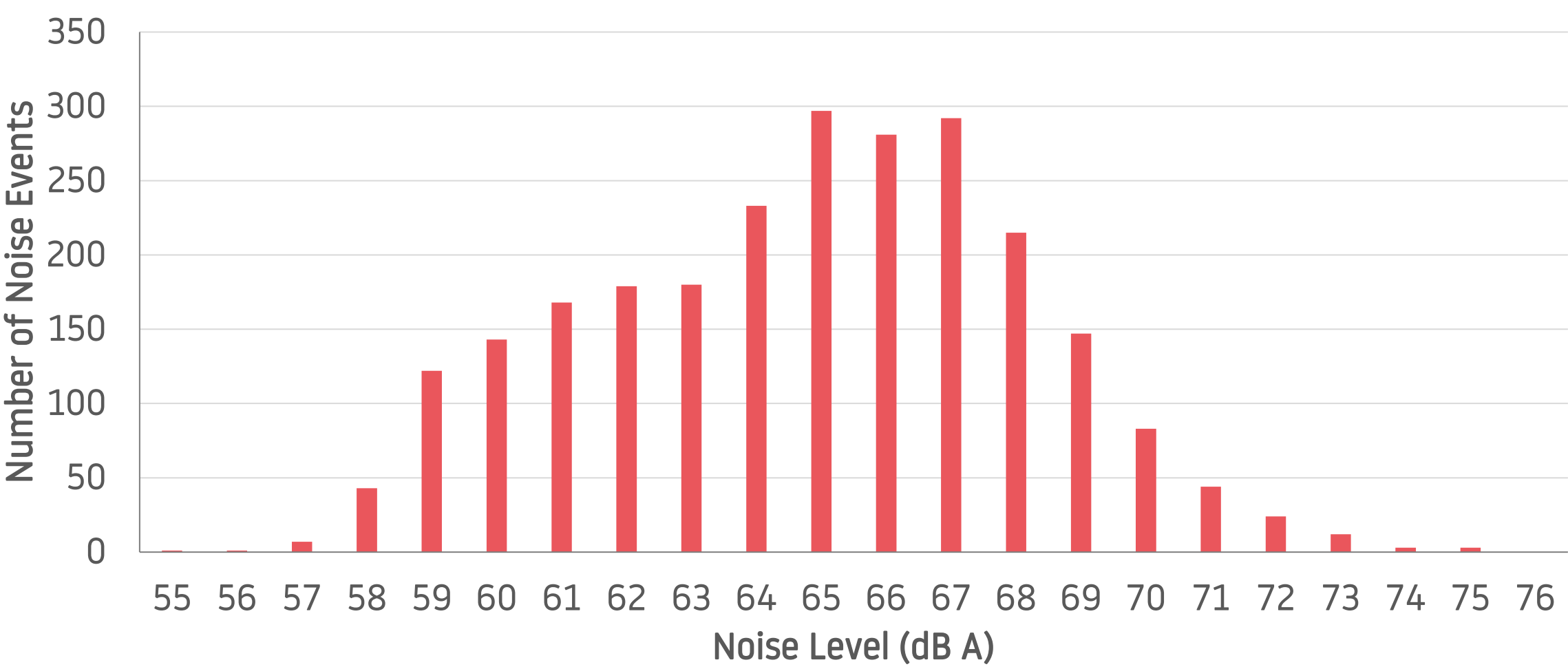
For Cheverell's Green, the noise monitoring terminal collected readings from 1,988 aircraft. During the period, there were total of 3,790 westerly departures. 2,921 flights flew within 3km of Cheverell's Green as shown on the previous page (2,901 within 2km; 25 within 1km).

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 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	66	66.8
A319	125	65.8
A320 CEO	810	65.4
A20N (A320 NEO)	190	61.5
A321 CEO	173	67.1
A21N (A321 NEO)	152	65.3
B738	259	67.5
B752	62	61.6
GLEX	128	63.5



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

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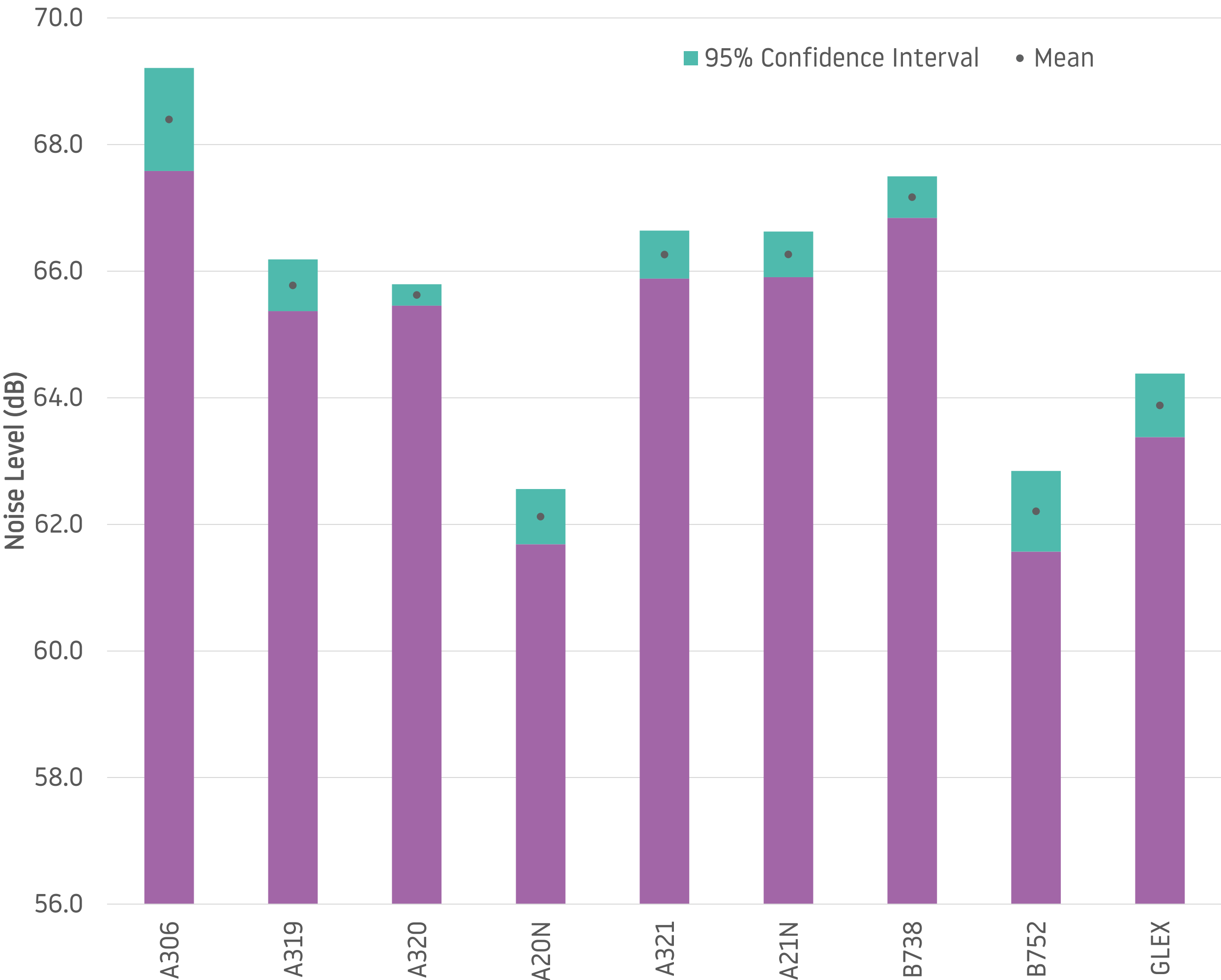
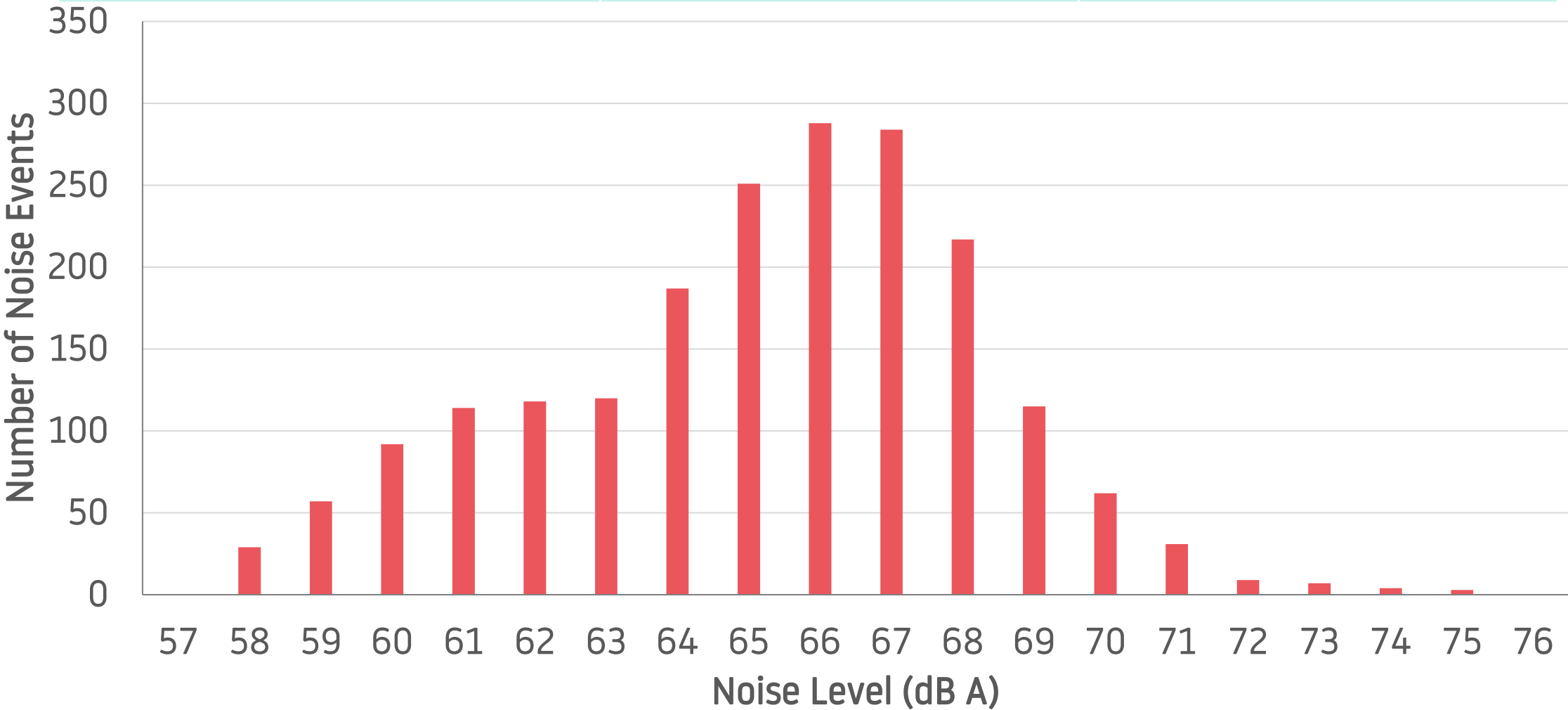
Flamstead Noise Results

- The average noise in Flamstead is 64.7dB, a reduction of 0.6dB from the same location LLA monitored in 2019. The result is based on a sample size of 2,478.
- The table overleaf shows the average noise level 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 65.4dB in Flamstead.
- The newer generation aircraft types, A320 NEO and A321 NEO, produced less noise than A320 and A321 CEOs. 13.8% of the movements were NEO type aircraft during the monitoring period. Operators are increasing the utilisation of these quieter and more fuel efficient aircraft. Comparing to previous years, the NEO typed aircraft accounted for 1.0% and 5.3% of all air transport movements in 2018 and 2019 respectively.
- The Boeing B734 and B738 continued to be the noisiest aircraft type at Flamstead during the monitoring period. They recorded an average noise of 67.6dB and 67.5dB respectively.

Cheverell's Green Noise Results

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	78	68.4
A319	117	65.8
A320 CEO	681	65.6
A20N (A320 NEO)	90	62.1
A321 CEO	153	66.3
A21N (A321 NEO)	141	66.3
B738	204	67.2
B752	58	62.2
GLEX	113	63.9



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

Cheverell's Green Noise Results

- The average noise in Cheverell's Green is 65.2dB. This is based on a sample size of 1,988.
- Cheverell's Green may experience a slight higher average noise level than Flamstead. This is due to the noise monitor at Cheverell's Green is closer to the runway and aircraft would likely be at a lower altitude when reaching Cheverell's Green (shown in previous section).
- The table overleaf 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 65.6dB in Cheverell's Green. The same as Flamstead, the A320 NEO produced less noise than A320 CEO.
- At Cheverell's Green, the Airbus A306 freight aircraft was the noisiest aircraft type during the monitoring period. It recorded an average of 68.4dB.

Conclusion

- During the monitoring period, the airport was using westerly operations for 79% of the time.
- The main aircraft types operating at London Luton Airport are A320 CEO and B738 which produced an average noise of 65.4dB and 67.5dB respectively in Flamstead; and 65.6dB and 67.2dB in Cheverell's Green. 13.8% and 11.6% of the noise events recorded in Flamstead and Cheverell's Green were created by the newer generation aircraft, A320 NEO and A321 NEO, registering average noise events of 61.5dB and 65.3dB, 62.1dB and 66.3dB respectively, quieter than the Airbus CEO departure noise.
- The average altitude of aircraft in Flamstead is 4,249 feet above sea level, and as Flamstead is already approximately 486 feet above sea level, aircraft will typically be 3,763 feet above ground level in this area.
- For Cheverell's Green, the average altitude of aircraft is 3,823 feet above sea level, and as Cheverell's Green is already approximately 545 feet above sea level, aircraft will typically be 3,278 feet above ground level in this area.
- Above Flamstead and Cheverell's Green aircraft are typically between 3,000-3,999 feet during the monitoring period. This accounted for 39% of all aircraft in Flamstead and 52% in Cheverell's Green. We also saw 58% and 35% of aircraft achieve altitudes above 4,000 feet in Flamstead and Cheverell's Green respectively.
- Most westerly departure aircraft shown in the altitude analysis flew within or above the NPR corridor.
- During the monitoring period, 16 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 Flamstead and Cheverell's Green.

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.

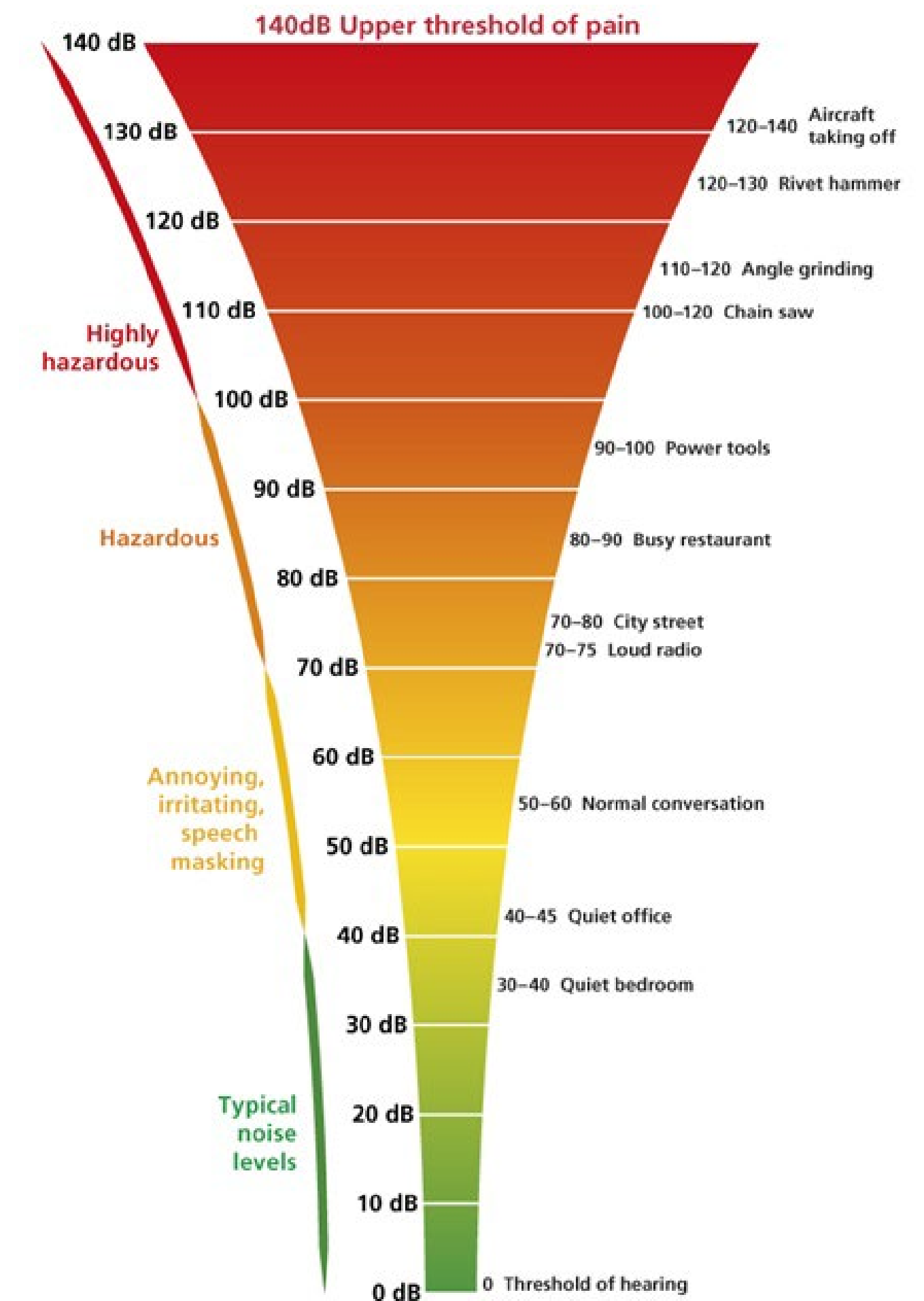
Gate Analysis: A gate which is drawn across an area and will gather information about every aircraft passing through the gate area.

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