Community Noise Report

South Luton

July – October 2023

London Luton Airport

Introduction

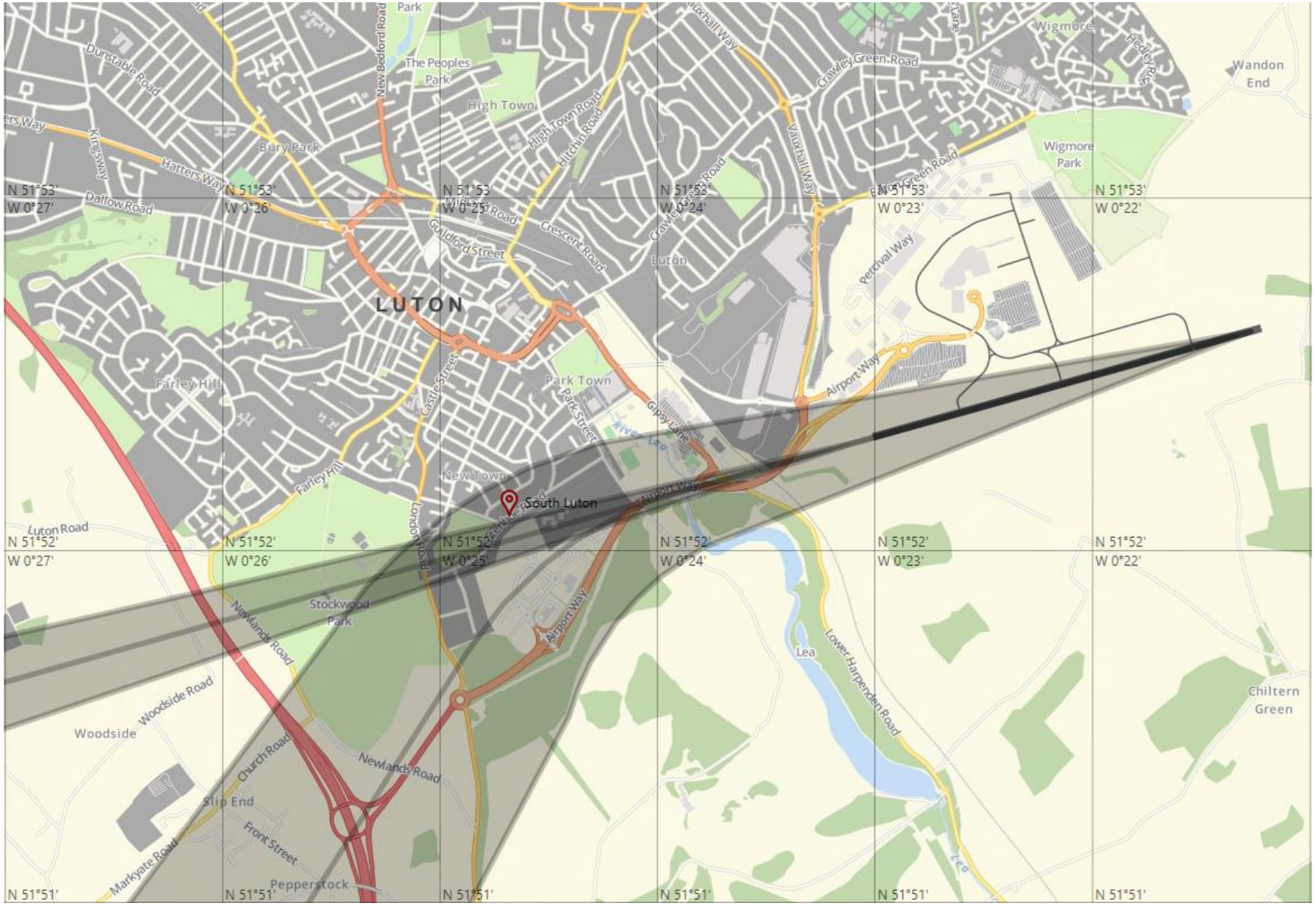
As part of the ongoing noise monitoring programme, London Luton Airport deployed a portable noise monitoring terminal in South Luton.

The purpose of the monitoring programme is to understand the typical noise levels created in the local community. **For South Luton it specifically related to westerly departures and easterly arrivals. The Standard Instruments Departures (SIDs) or Noise Preferential Routes (NPRs) and the final approach flightpath are shown on the map.**

The noise monitor was located at a residential property on Cutenhoe Road, approximately 125m northwest of the easterly arrival centreline and approximately 315m northwest of the westerly departure centreline, at an altitude 490 feet above sea level. The red pinpoint on the map shows the noise monitor location.

The noise monitor in South Luton was in place between the 27th July 2023 and 9th October 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.

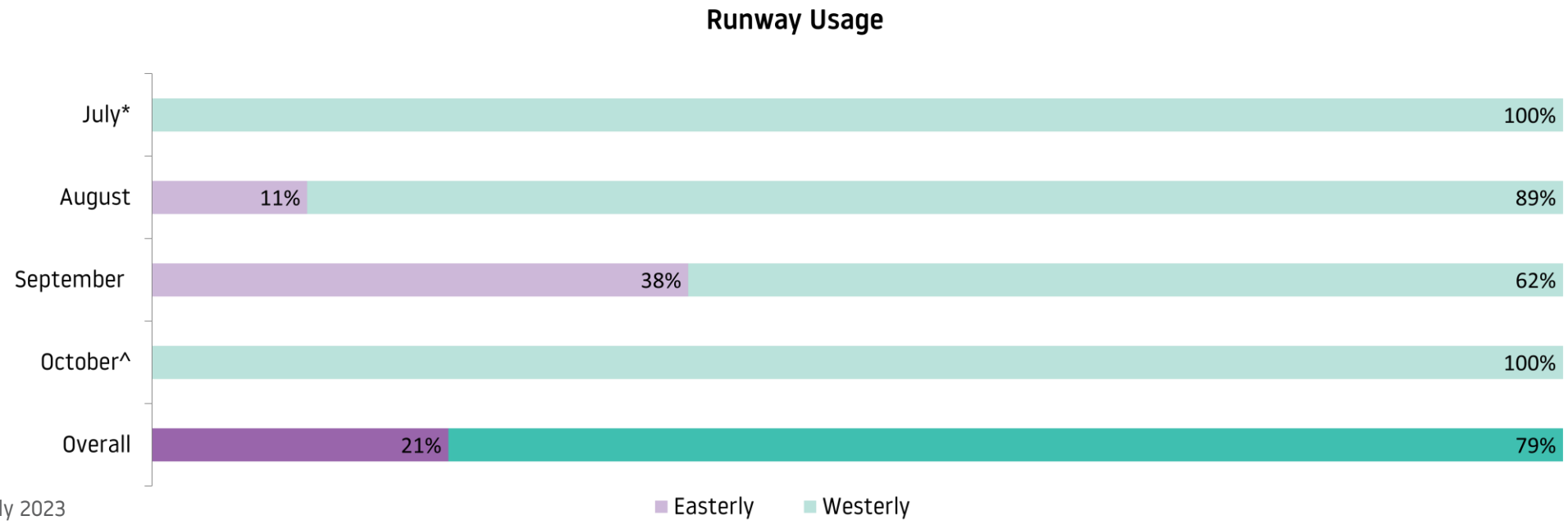


LLA operations during the monitoring period

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 21% Easterly and 79% Westerly. The 5-year average for this time of year is 28% Easterly vs 72% Westerly.

There were 14,453 aircraft departing on the westerly route and 3,580 aircraft arriving on the easterly route in Q3 2023.



*28th – 31st July 2023

^1st – 8th October 2023

Daily Movements during monitoring period

The chart below shows the number of daily westerly departures and easterly arrivals that passed over the noise monitor. Due to the location, all flights that departed from our westerly runway and landed on our easterly runway would have flown above the noise monitor terminal.

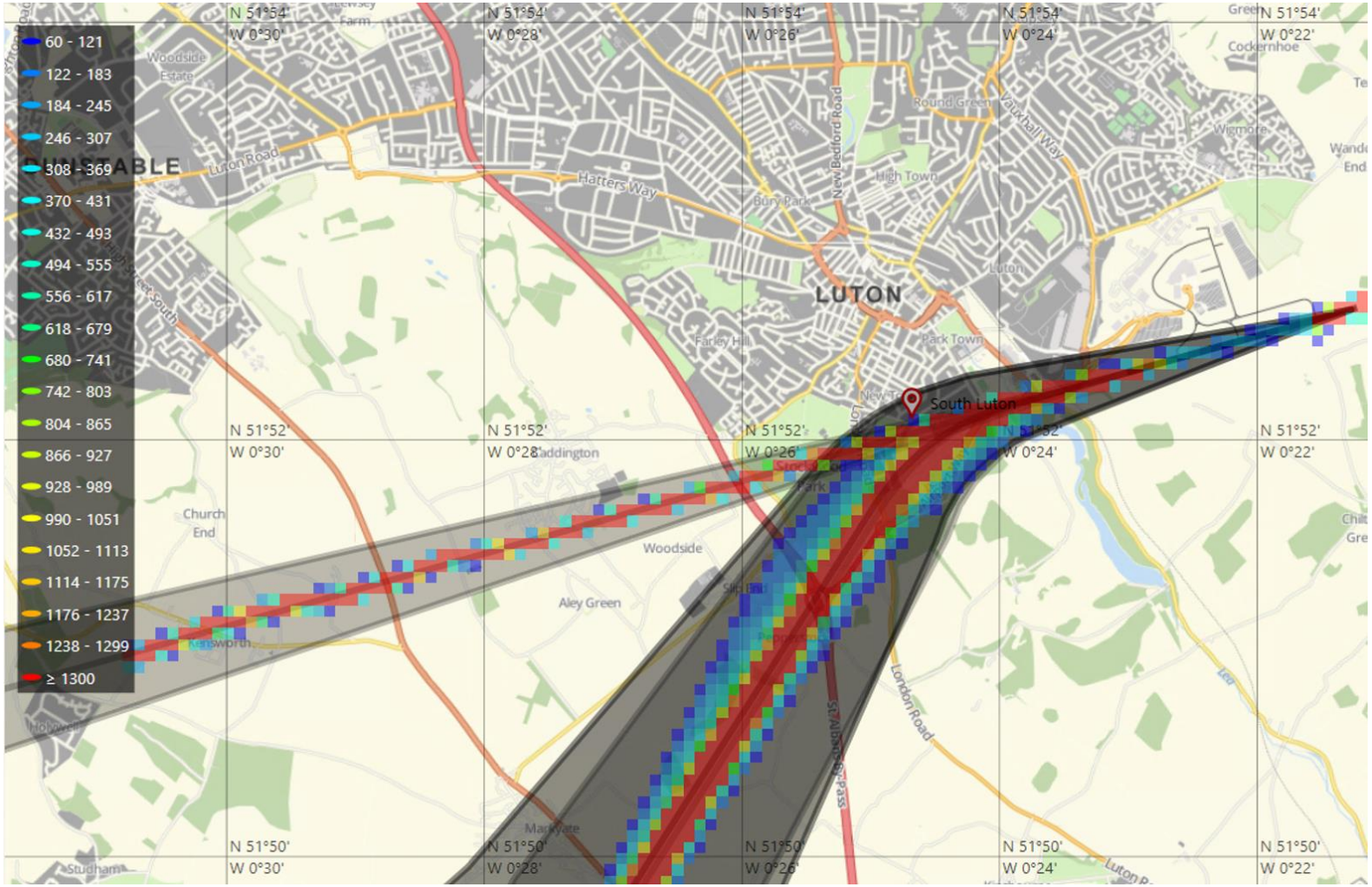
Operations during monitoring period

The graph below represents the average aircraft movement by hours during the monitoring period. Depending on the operating direction on the day, residents in South Luton may experience different flight patterns. During the peak periods, residents of South Luton may notice more frequent aircraft movements. In general, the morning peak starts at 6am on the days of westerly operation which occur approximately 70% of the time annually. Residents at this NMT location may notice the morning peak begins an hour later at 7am on the days of easterly operation and these aircraft would be lower at altitude and more noticeable as the dwellings at this location are just next to the easterly final approach flightpath.

During the night period of 23:00 – 06:00 in the monitoring period, there were average of 30 arrivals or 24 departures.

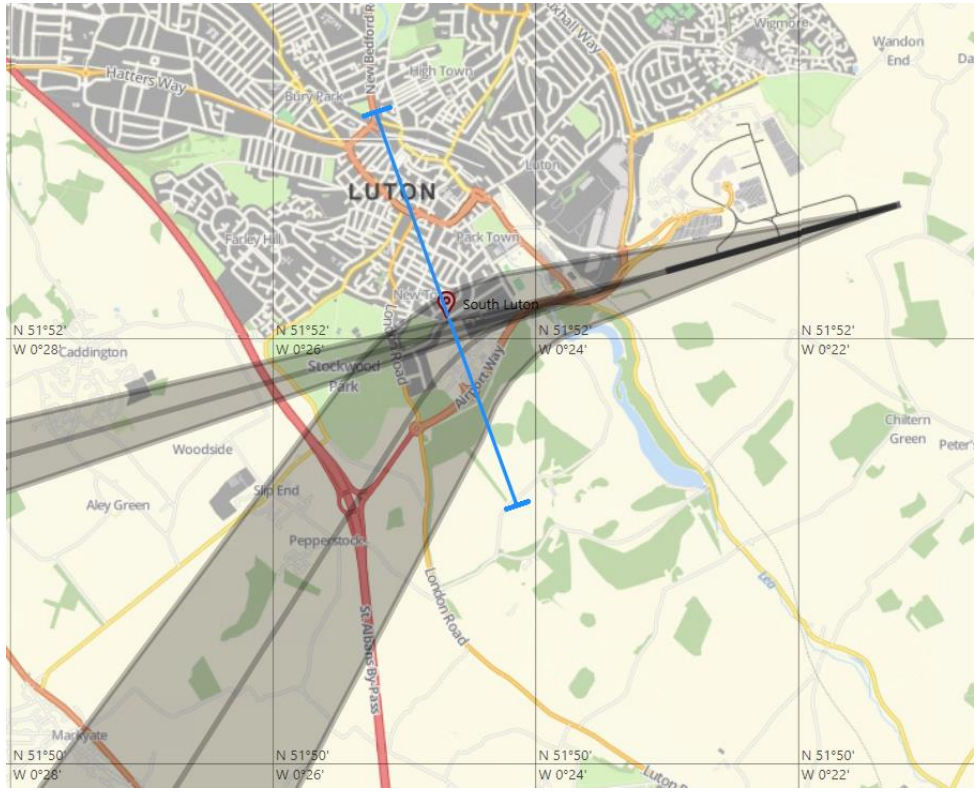
Aircraft Tracks

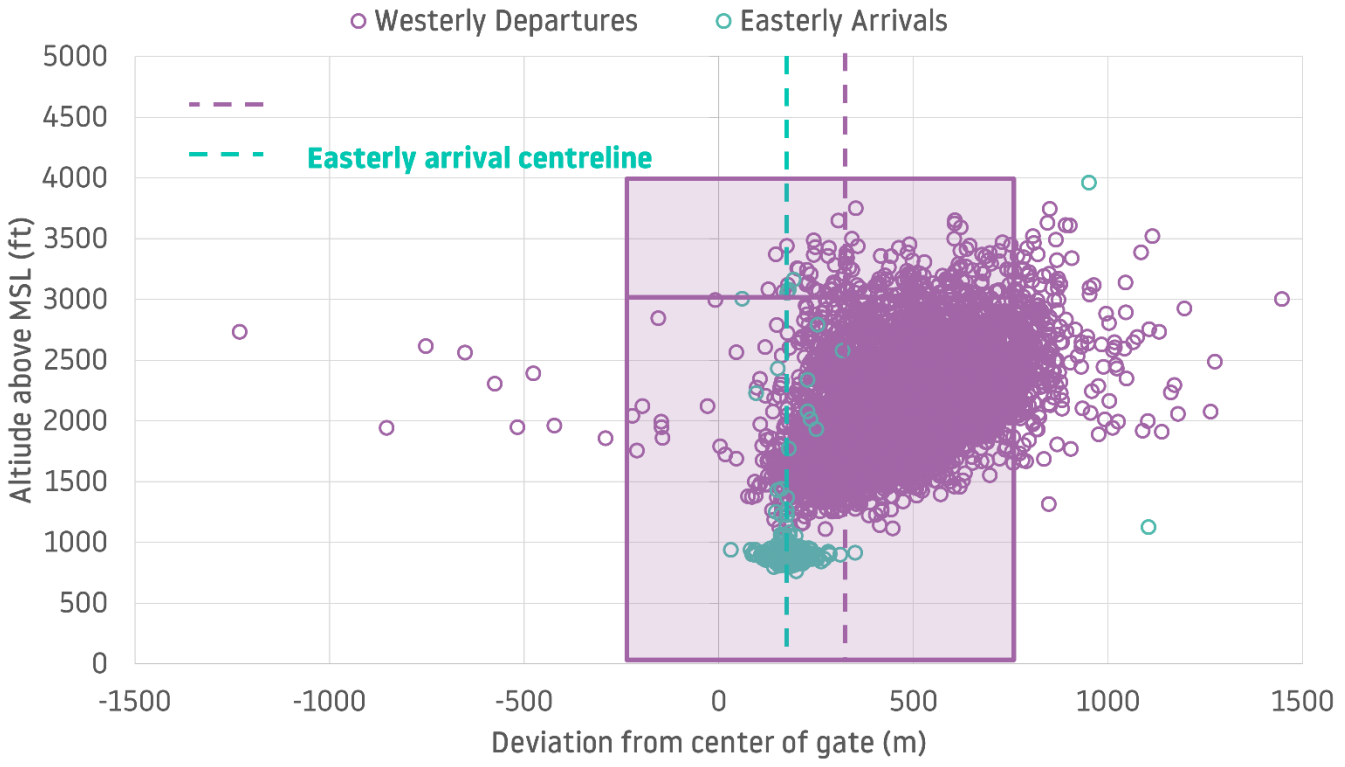
The heat map below show the representative flight tracks that passed near the noise monitor terminals during the monitoring period.
The red pinpoint indicates the location of the noise monitor in South Luton. This location is affected by easterly arrivals and westerly departures.



Altitude Gate Analysis

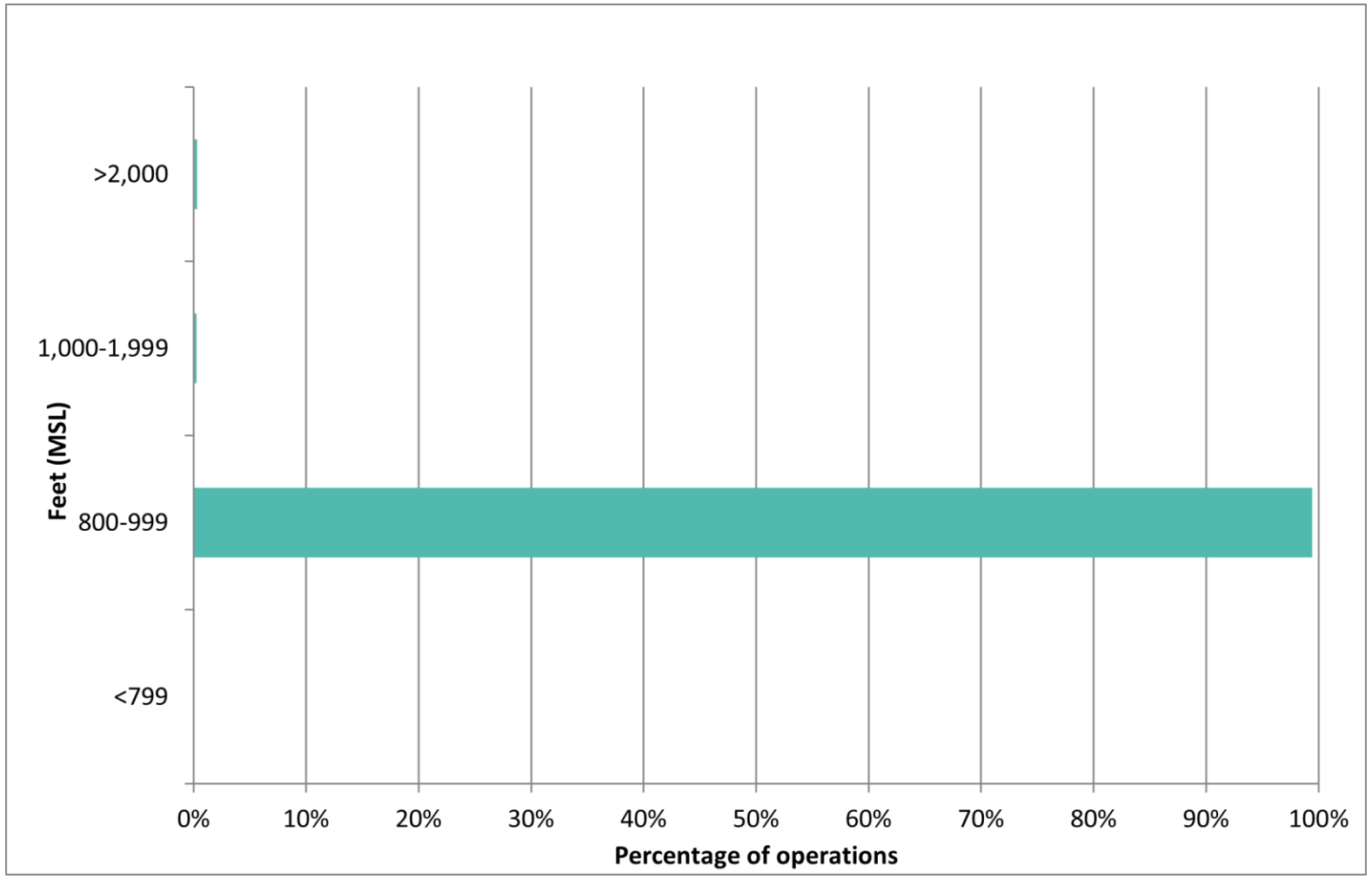
The altitude analysis for South Luton, shows the vertical and lateral dispersion of aircraft 1.5km either side of the noise monitor. The map below shows the 3km gate which is drawn perpendicular to the NPR from north-west to south-east and it gathered information of every aircraft passing through the gate area. The scatter graph below shows the distance and altitude of aircraft from the noise monitor during the monitoring period. The westerly NPR is labelled and displayed by the shaded area. Departing aircraft must remain within the NPR until reaching the release altitude of 3,000ft during the daytime period and 4,000ft at nighttime period (4,000ft at all times when departing on the MATCH SID). Due to the close proximity of South Luton to the departure and arrival routes, local residents may see aircraft flying above South Luton at low altitude. A number of departing aircraft that flew outside the NPR laterally were investigated. Most were vectored by air traffic control due to weather and some were fined as part of the noise and track violation scheme.





Altitude Gate Analysis – Easterly Arrivals

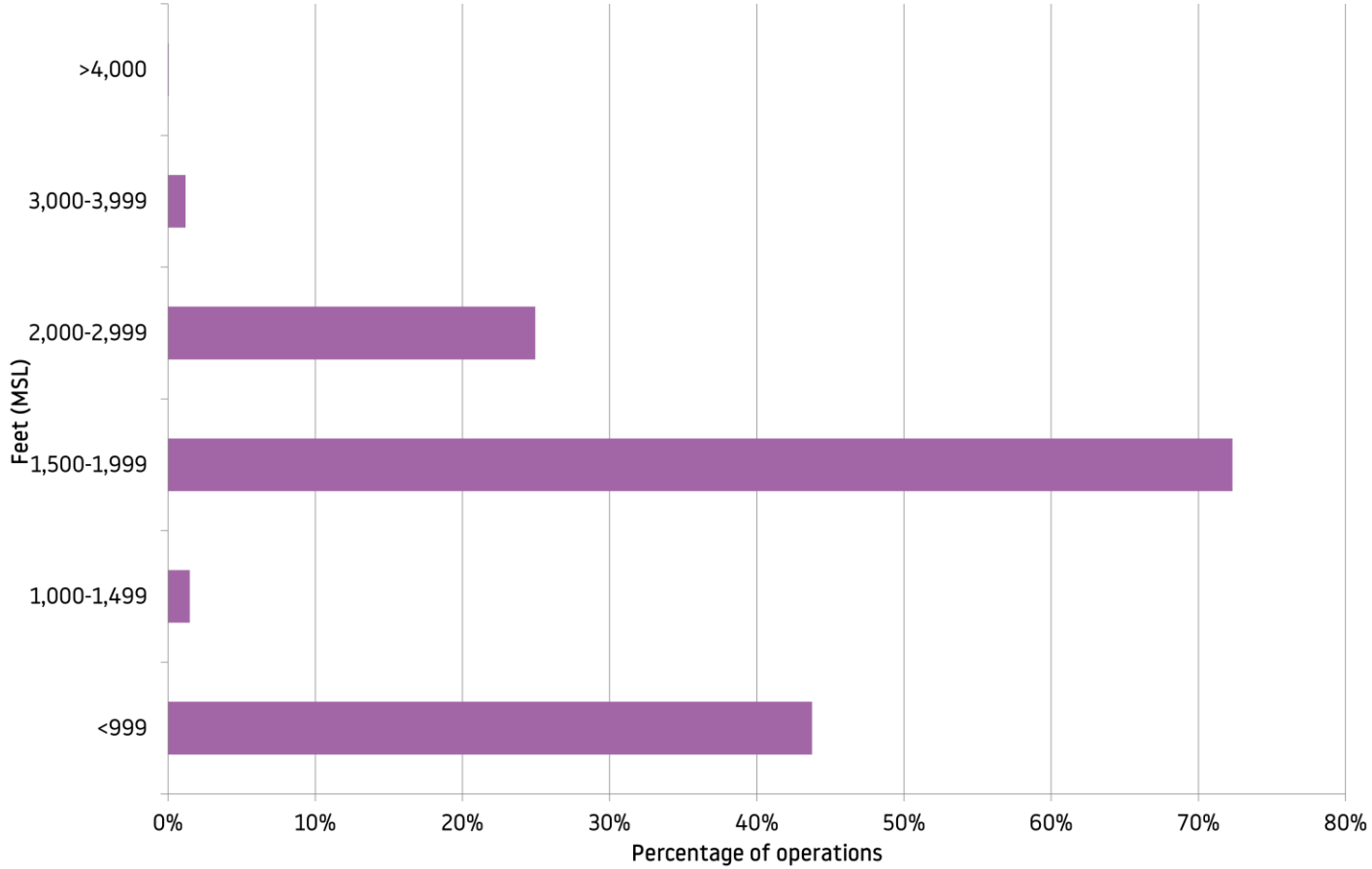
The altitude analysis is split into two parts in this South Luton report – Departures and Arrivals. The bar charts in this section show the concentration of the aircraft when aircraft reach the noise monitor in South Luton. For arrivals, aircraft tend to be at much lower altitude due to the close proximity to the runway at South Luton. The average altitude of aircraft in this area was 905 feet AMSL (415 feet AGL).



Aircraft Type	Number of movements detected	Average Altitude (AMSL in ft)
A306	47	914
A319	1,220	905
A320 CEO	1,357	907
A320 NEO (A20N)	903	914
A321 CEO	585	875
A321 NEO (A21N)	1,020	905
B737-800 NG (B738)	662	886
B737 Max 8 (B38M)	301	886
Global Express (GLEX)	200	912
Cessna 560X (C56X)	182	911
Gulfstream G560 (GLF6)	111	909
All	7,900	905

Altitude Analysis – Westerly Departures

For departures, the average altitude of aircraft was 1,947 feet AMSL (1,457 feet AGL) when they reach above the noise monitor above Cutenhoe Road in South Luton. The purple bar chart shows that the majority of the departing flights were above 1,500 feet AMSL. The lighter weight aircraft, Cessna 560X, Gulfstream G650 and Global Express, achieved higher altitude.



Aircraft Type	Number of movements	Average Altitude (AMSL in ft)
A306	128	2,440
A319	2,704	1,782
A320 CEO	3,215	1,892
A320 NEO (A20N)	2,108	1,890
A321 CEO	1,309	1,944
A321 NEO (A21N)	2,404	1,877
B737-800 NG (B738)	1,457	1,859
B737 Max 8 (B38M)	779	1,841
Global Express (GLEX)	450	2,173
Cessna 560X (C56X)	380	2,417
Gulfstream G560 (GLF6)	219	2,181
All	15,153	1,947

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 South Luton, the noise monitoring terminal collected readings from 2,721 easterly arriving aircraft and 6,560 westerly departing aircraft. During the period, there were 2,940 easterly arrivals and 10,993 westerly departures.

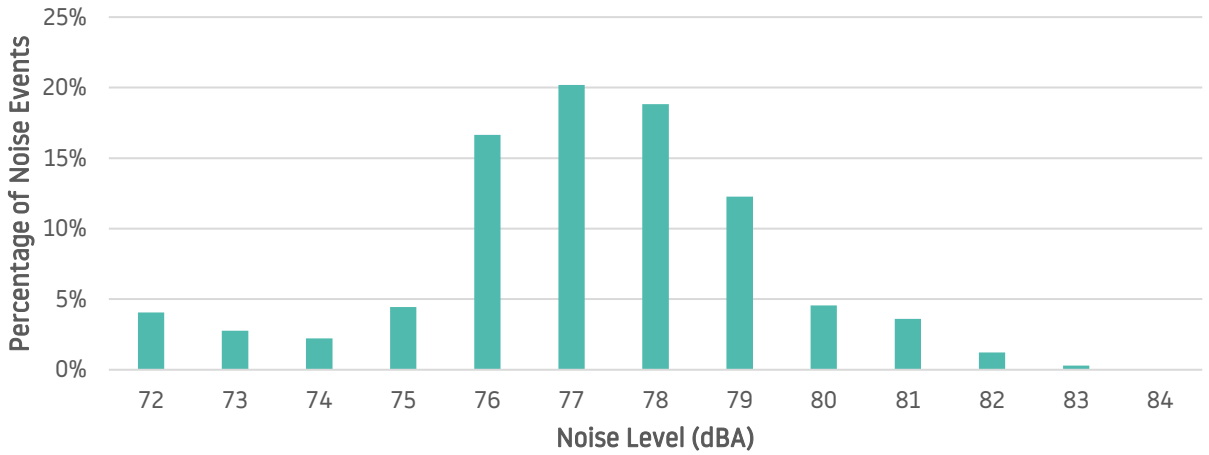
It is noteworthy that the noise monitor may not be able to record every aircraft noise event if the aircraft noise level is below ambient background noise. Therefore, there may be a difference between the number of actual air transport movements and number of aircraft noise events collected during the 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, 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 338 recording were excluded from the analysis for the above reasons.

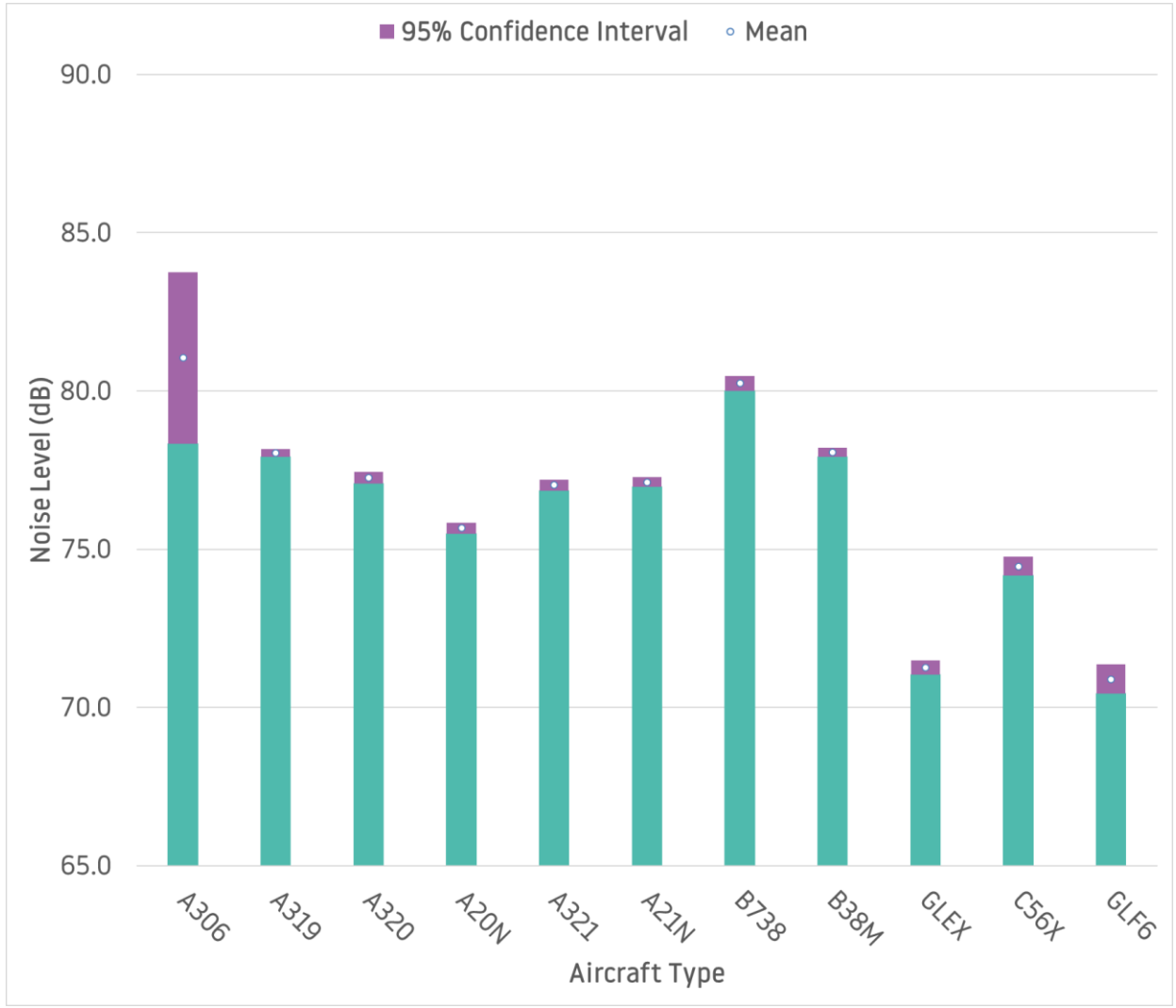
Noise Results – Easterly Arrivals

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)
A306	12	81.1
A319	766	78
A320 CEO	1,542	77.3
A320 NEO (A20N)	551	75.7
A321 CEO	567	*77
A321 NEO (A21N)	490	*77.1
B737-800 NG (B738)	818	80.2
B737 Max 8 (B38M)	48	78.1
Global Express (GLEX)	229	71.3
C56X	146	74.5
GLF6	137	70.9



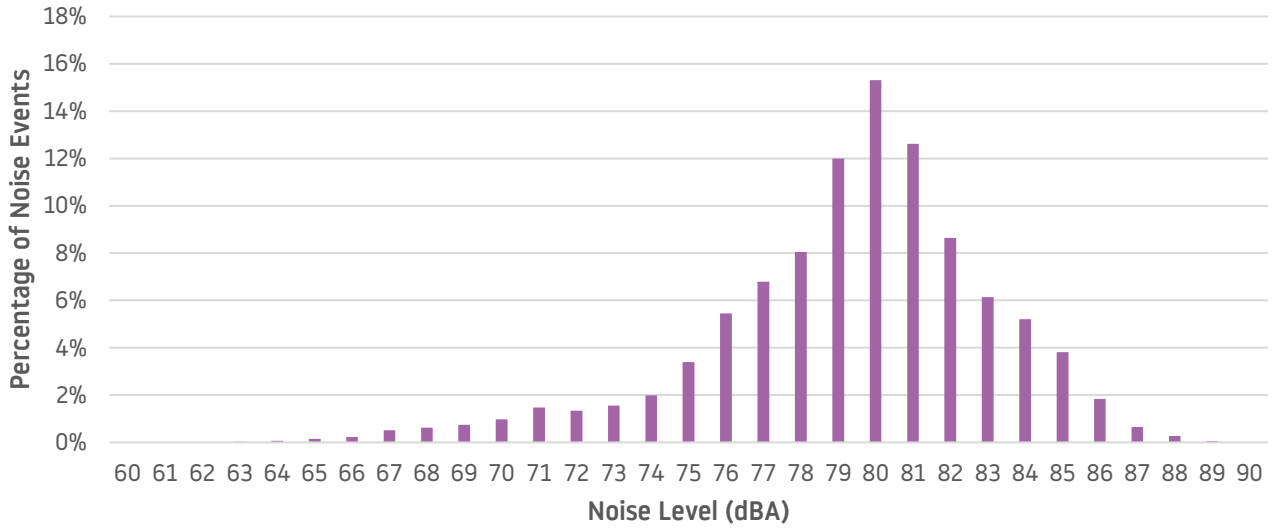
*The noise results shown in the analysis are only for those aircraft types that recorded more than 100 events per aircraft (A306 and B737 Max 8 included for comparison).

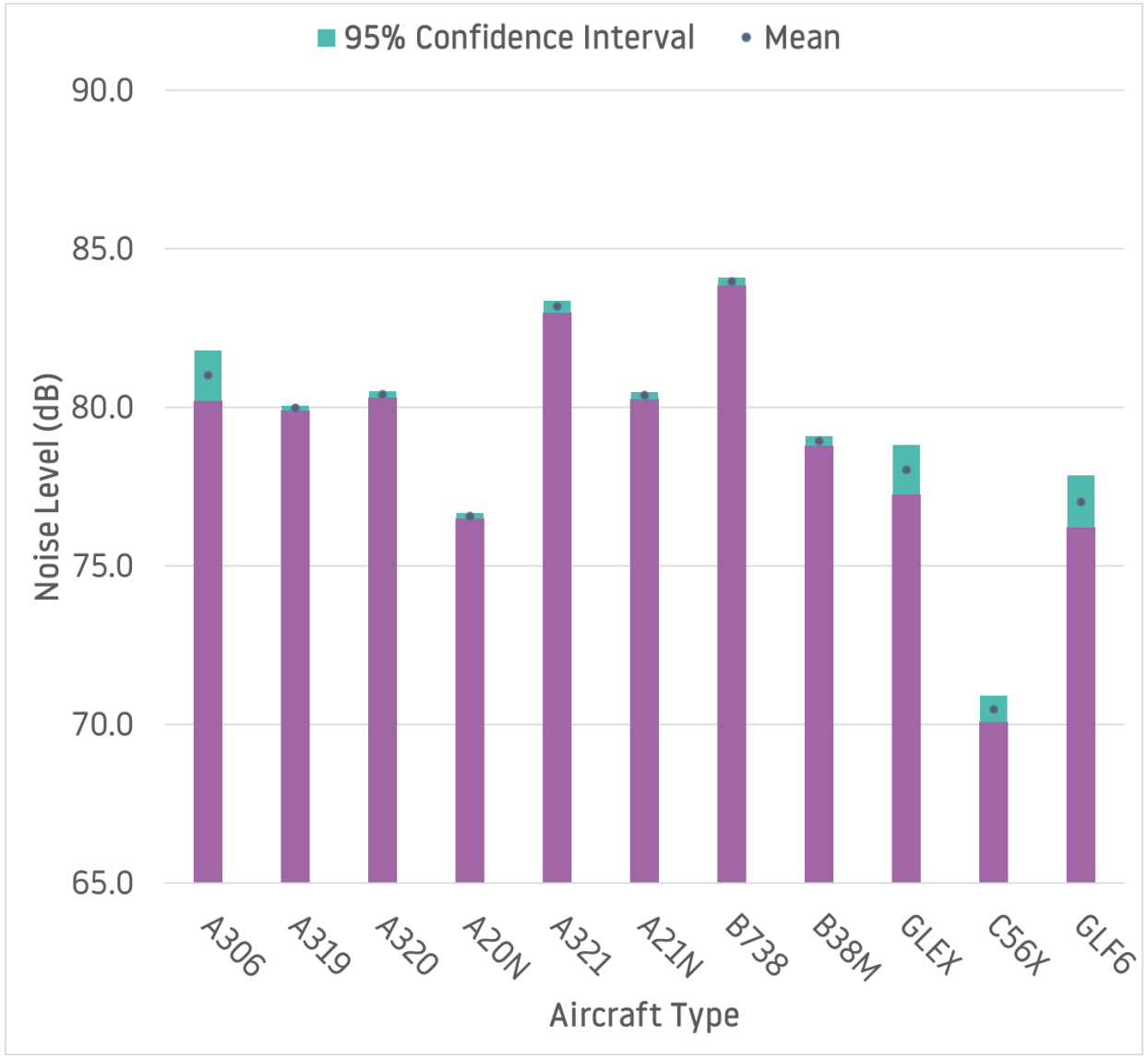


*A321 NEO average noise result was slightly louder than A321 CEO. There is an investigation ongoing with the CAA and Airbus regarding this.

Noise Results – Westerly Departures

Aircraft Type*	Number of movements	Average Noise (dB)
A306	44	81
A319	999	80
A320 CEO	1,225	80.4
A320 NEO (A20N)	822	76.6
A321 CEO	480	83.2
A321 NEO (A21N)	897	80.4
B737-800 NG (B738)	549	84
B737 Max 8 (B38M)	291	78.9
Global Express (GLEX)	131	78
C56X	133	70.5
GLF6	60	77





*The noise results shown in the analysis are only for those aircraft types that recorded more than 100 events per aircraft (A306 included for comparison).

Noise Results - Summary

- Cutenhoe Road residents in South Luton, may experience louder aircraft noise when the airport is operating in the easterly direction as the arrival aircraft follow the final approach flightpath in a straight line towards the runway at low altitude. The altitude of the arrival aircraft is much lower than the westerly departing aircraft. The arrival flightpath is directly above Cutenhoe Road so therefore the aircraft noise would be more noticeable at this location.

- The average easterly arrival noise on Cutenhoe Road in South Luton was 76.5dB, based on a sample size of 2,721. On westerly operations, the average departure noise measured was 79.3 dB, based on a sample size of 6,560.

- From the results, Luton's most popular aircraft type by operators, Airbus A320 CEO, had an average noise of 77.3dB (arrival) and 80.4dB (departure).

- The departure noise from the newer generation aircraft, A320 NEO, produced less noise than A320 CEOs, at an average of 3.8dB quieter. Similarly, the Boeing 737 series, the new B737 Max 8 was 5.1dB quieter than its predecessor B737-800NG. Around 30% of all noise results movements were newer generation aircraft which are more fuel efficient and quieter.

- The freight aircraft A306 was one of the noisiest aircraft types at South Luton. This aircraft type is generally deployed in the daytime period.

Conclusion

- A mobile noise monitor was installed at a residential property on Cutenhoe Road from the end of July to the beginning of October 2023.
- For South Luton, it specifically related to westerly departures and easterly arrivals. During the monitoring period, the airport operated in the direction of easterly and westerly for 21% and 79% 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 South Luton is 1,947 feet above mean sea level (AMSL), and as South Luton is already approximately 490 feet AMSL, aircraft will typically be at 1,457 feet above ground level (AGL) in this area. For easterly arriving aircraft, the altitude would be lower than the departures at this location on Cutenhoe Road as landing aircraft need to follow a swallower angle of descent than the climb gradient for departure. Therefore, the noise from landing aircraft would be louder than departing aircraft.
- The main aircraft type operating at London Luton Airport is the Airbus A320 CEO which produced an average noise of 77.3.4dB and 80.4dB for easterly arrival and westerly departure, respectively.
- 30% of the noise events recorded in South Luton were created by the newer generation aircraft, A320 NEO, A321 NEO and B737 Max 8. The A320 NEO registered average departing noise of 76.6.dB, 3.8dB lower than A320 CEOs. More noticeably, the B737 Max 8 was significantly quieter than its predecessor B737-800NG with a difference of 5.1 dB.
- During the monitoring period, 84 departure aircraft (both westerly and easterly) were investigated as part of the Noise and Track violation scheme. Of these, 15 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.