Community Noise Report

South Luton

June – October 2022

London Luton Airport

Introduction

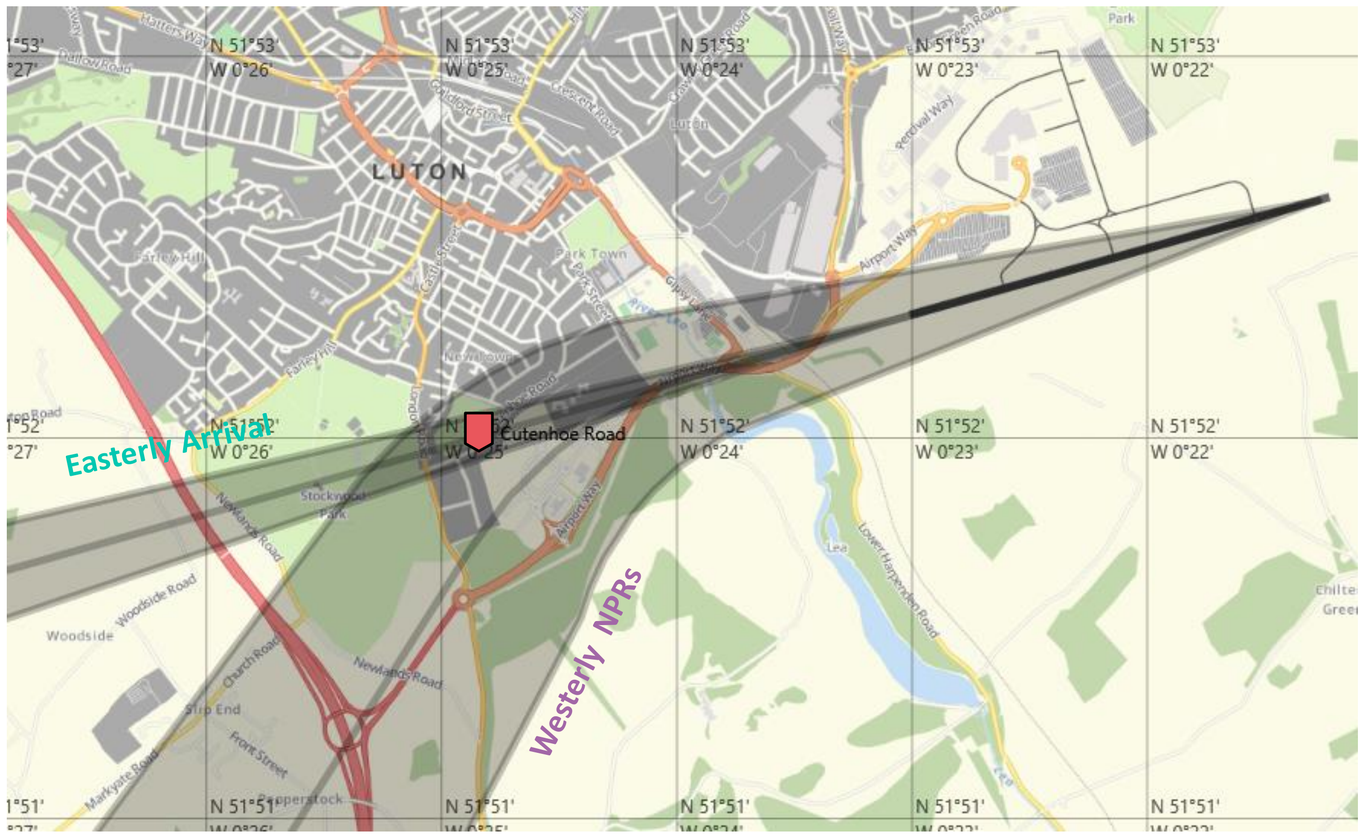
As part of the ongoing noise monitoring programme and the NADP trial*, London Luton Airport deployed a portable noise monitoring terminal in South Luton.

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 the westerly departures and easterly arrivals. The Standard Instrument 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, directly underneath the easterly arrival centreline and approximately 200m northwest of the westerly departure centreline, at an altitude of 525 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 13th June and 23rd October 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.



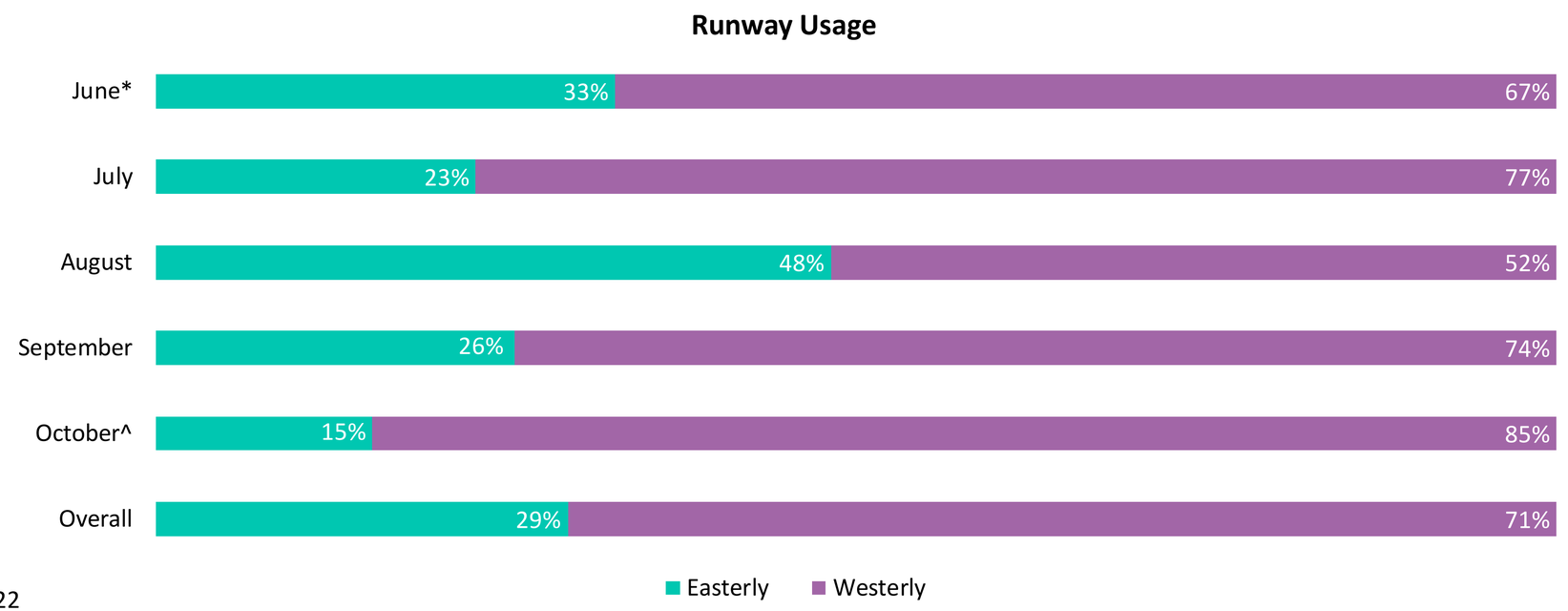
*See glossary

LLA Operation

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 29% easterly and 71% westerly. The five year average for this time of year is 28% easterly vs 72% westerly.

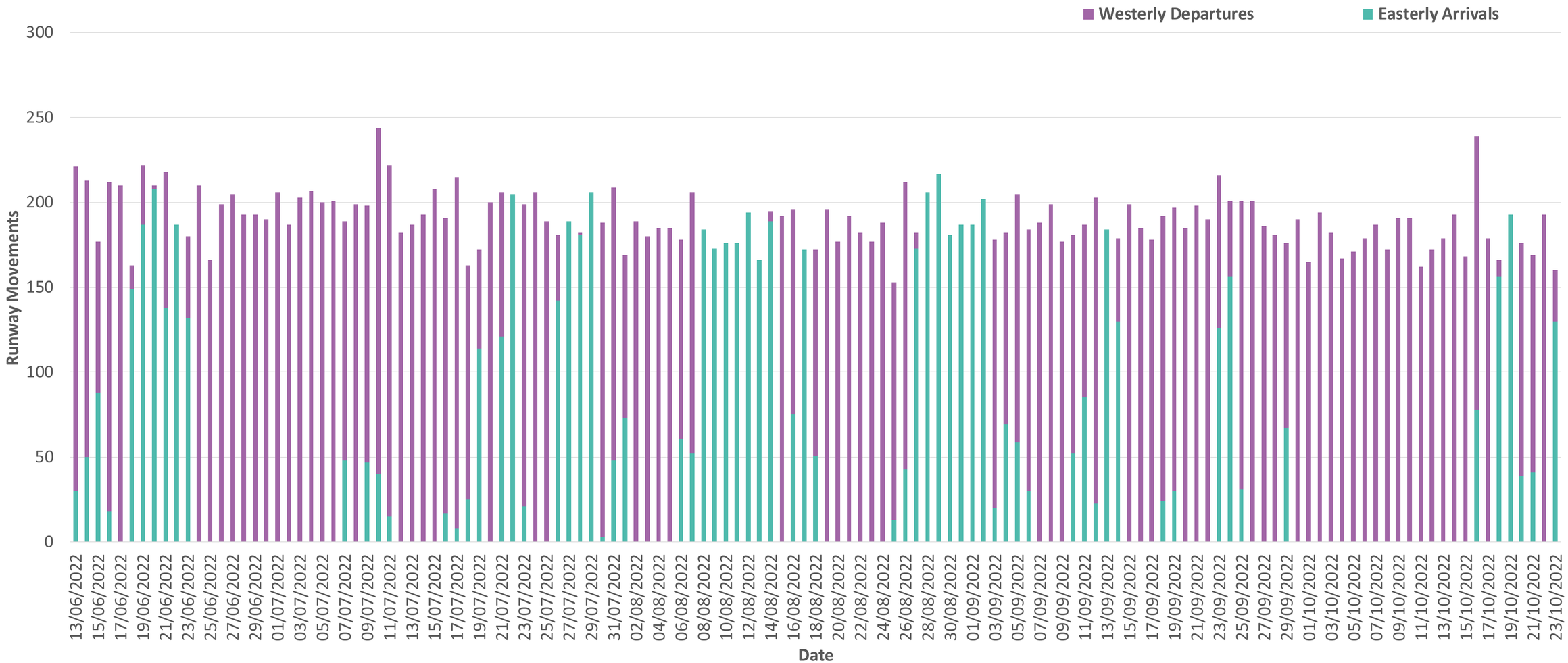
There were 21,809 aircraft departed on the westerly routes and 9,164 aircraft landed on the easterly runway whilst the noise monitor was located in South Luton. In terms of total air transport movements, LLA was operating at 88% of pre-pandemic level.



*13th – 30th June 2022
^1st – 23rd October 2022

Daily Movements

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.



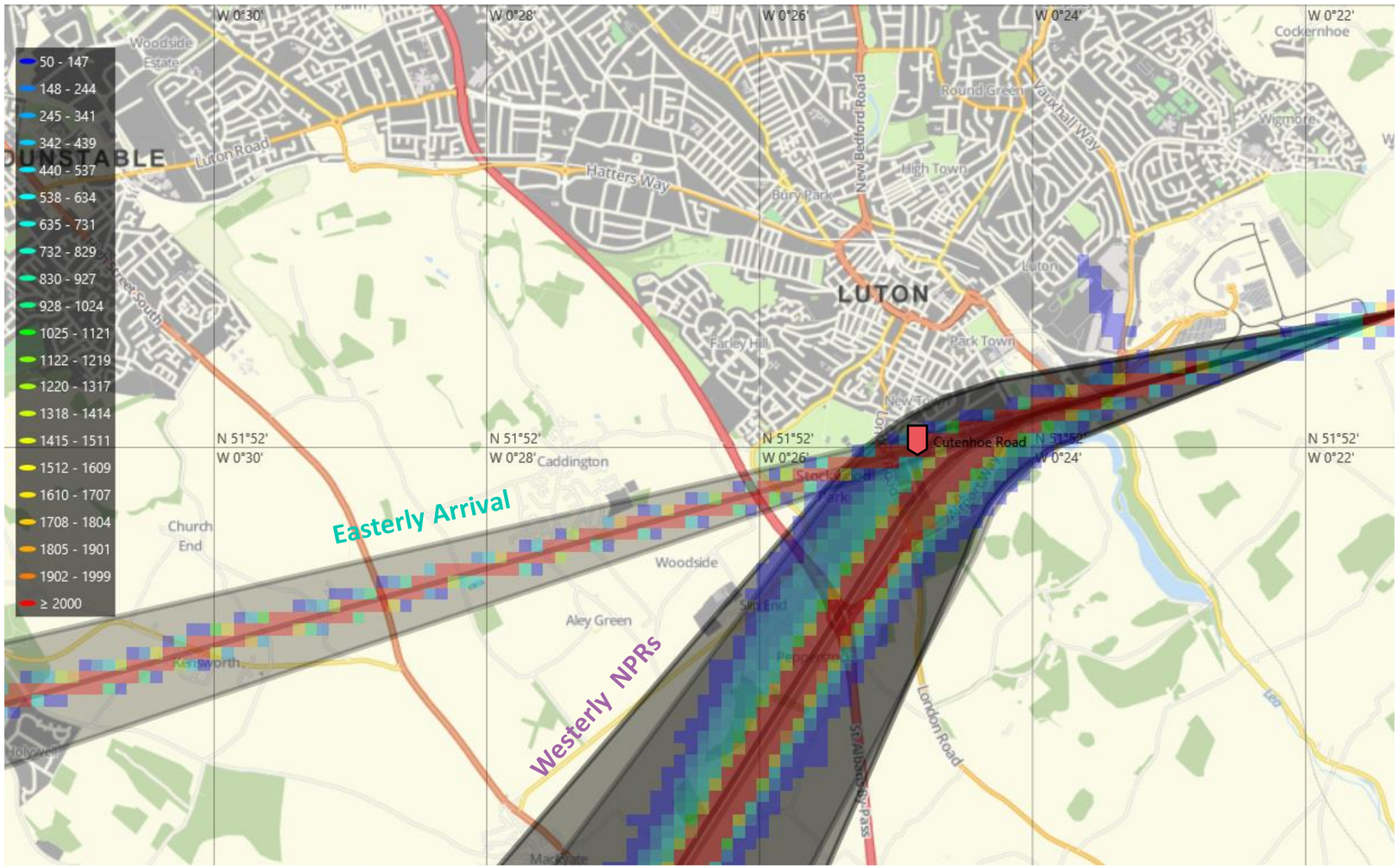
Operations

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, local 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 directly underneath the easterly final approach flightpath.

During the night period of 23:00 – 06:00 in the monitoring period, there were average of 32 arrivals or 10 departures.

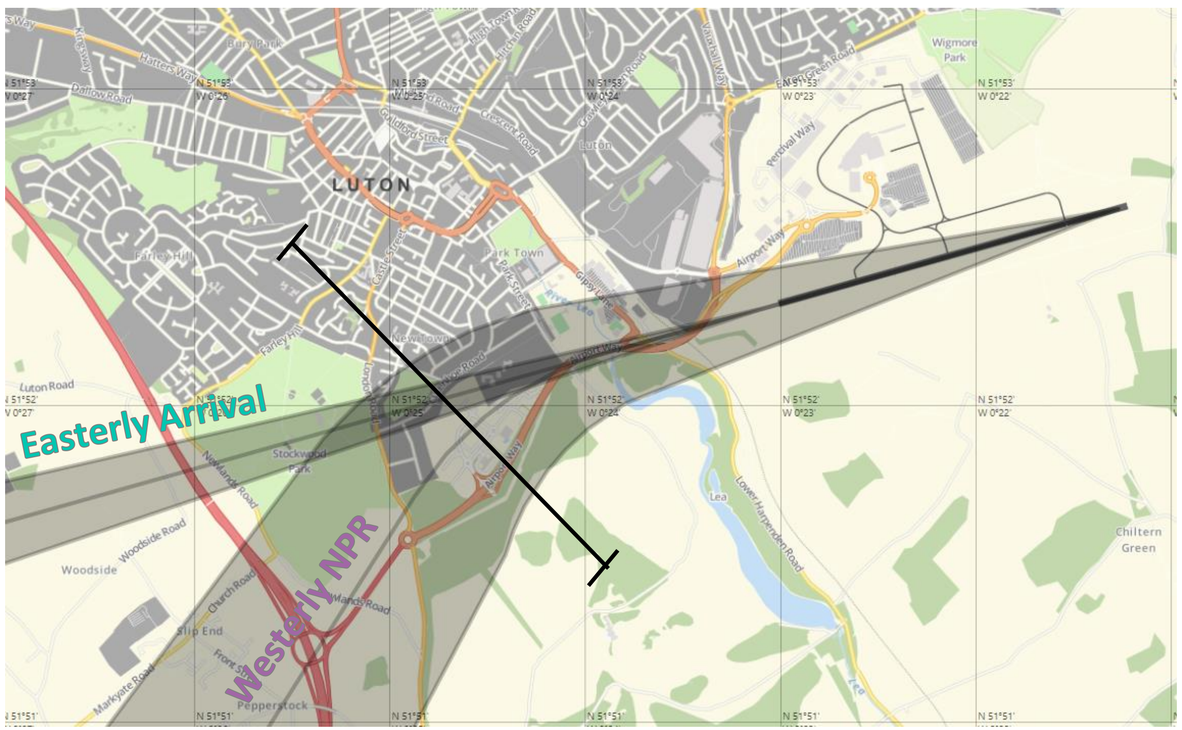
Aircraft Tracks

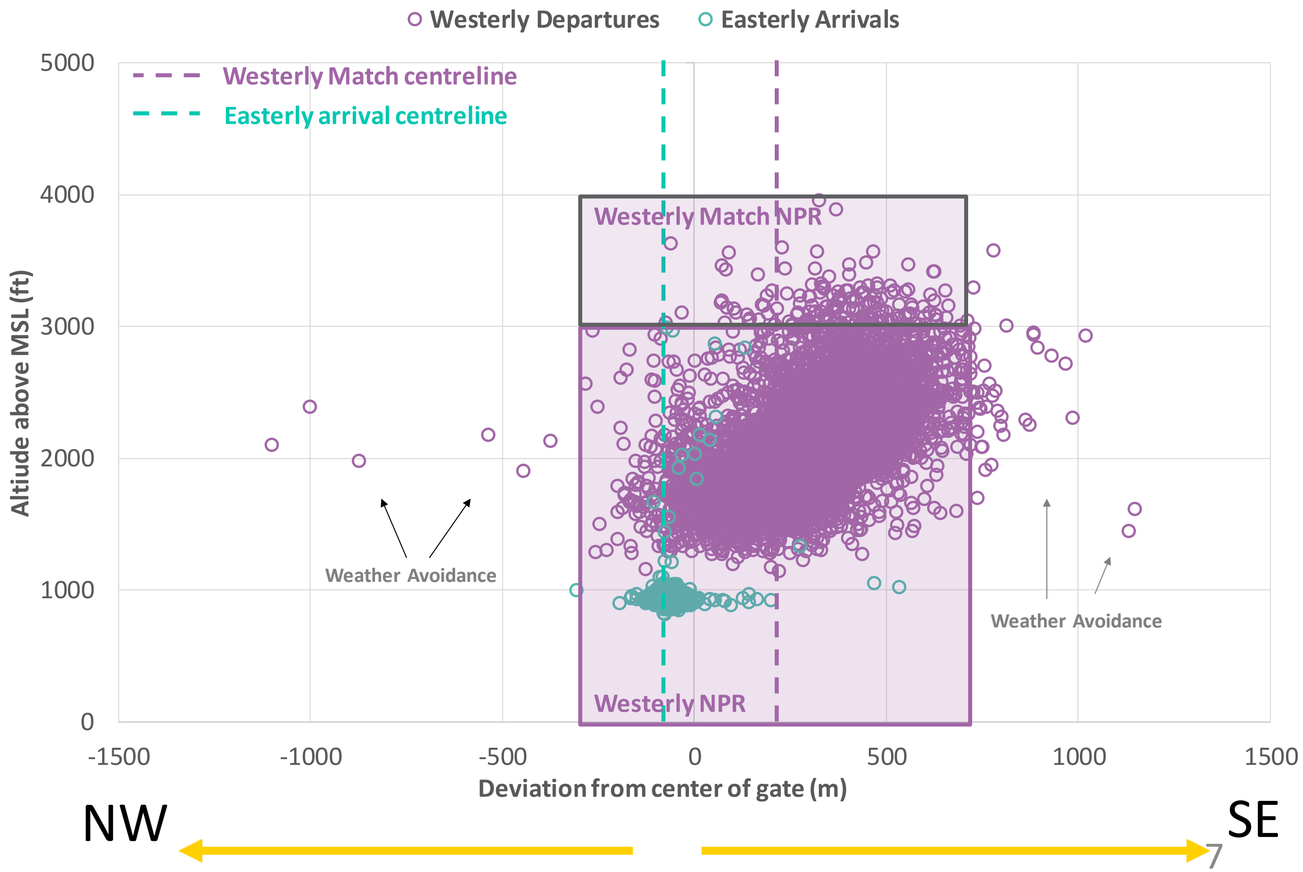
The heat map below show the representative flight tracks that passed near the noise monitor terminals during the monitoring period. The red pinpoint indicates the location of the noise monitor in South Luton. At this location, it is affected by easterly arrivals and westerly departures.



Altitude Gate Analysis

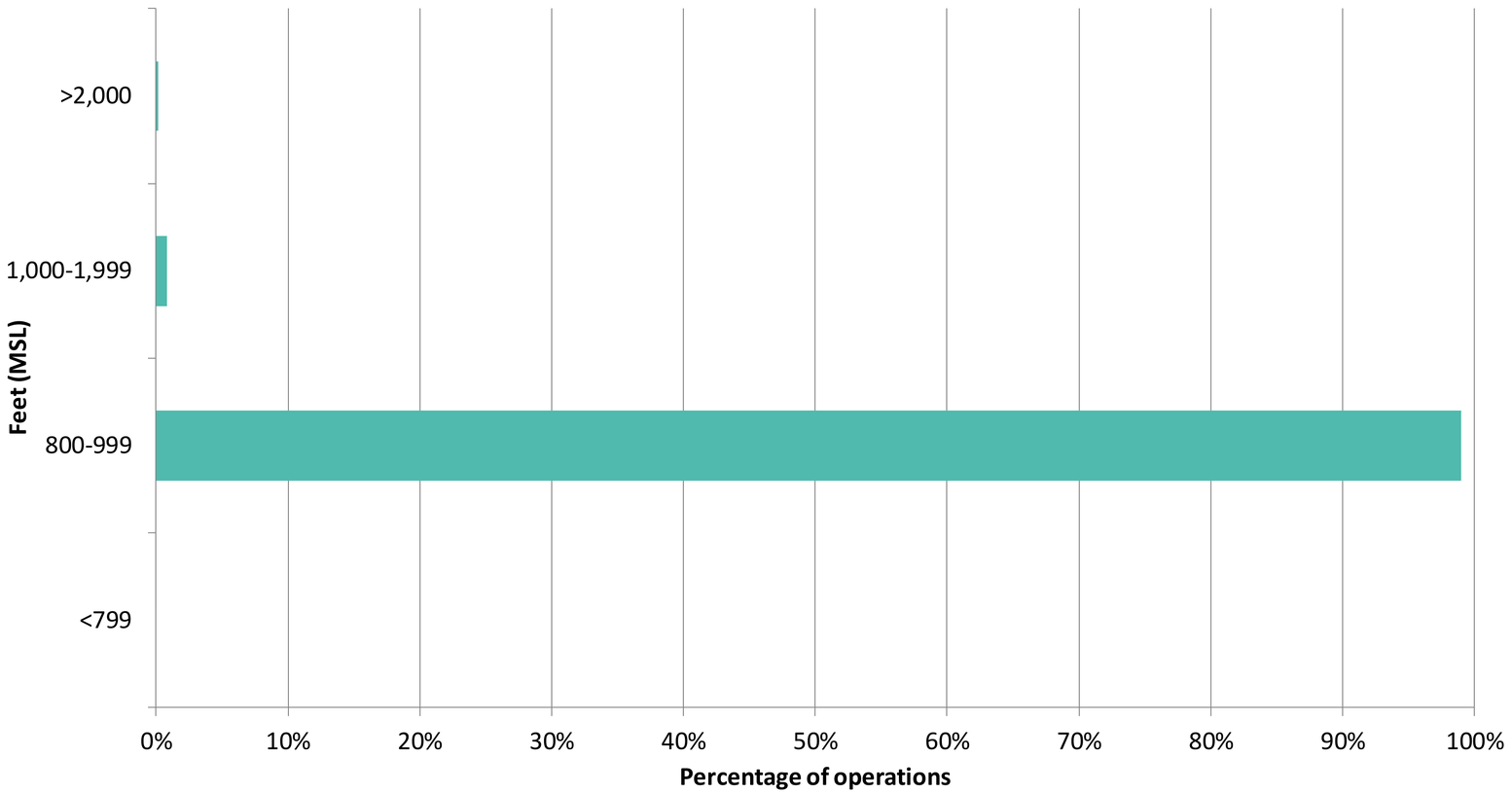
The altitude analysis for South Luton shows the vertical and lateral dispersion of aircraft 1.5km either side of the noise monitor. The map below shows the 3km gate which is drawn perpendicular to the NPR from northwest to southeast and it gathered information of every aircraft passing through the gate 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 day time period and 4,000ft at night time 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 avoidance.





Altitude Gate Analysis – Easterly Arrivals

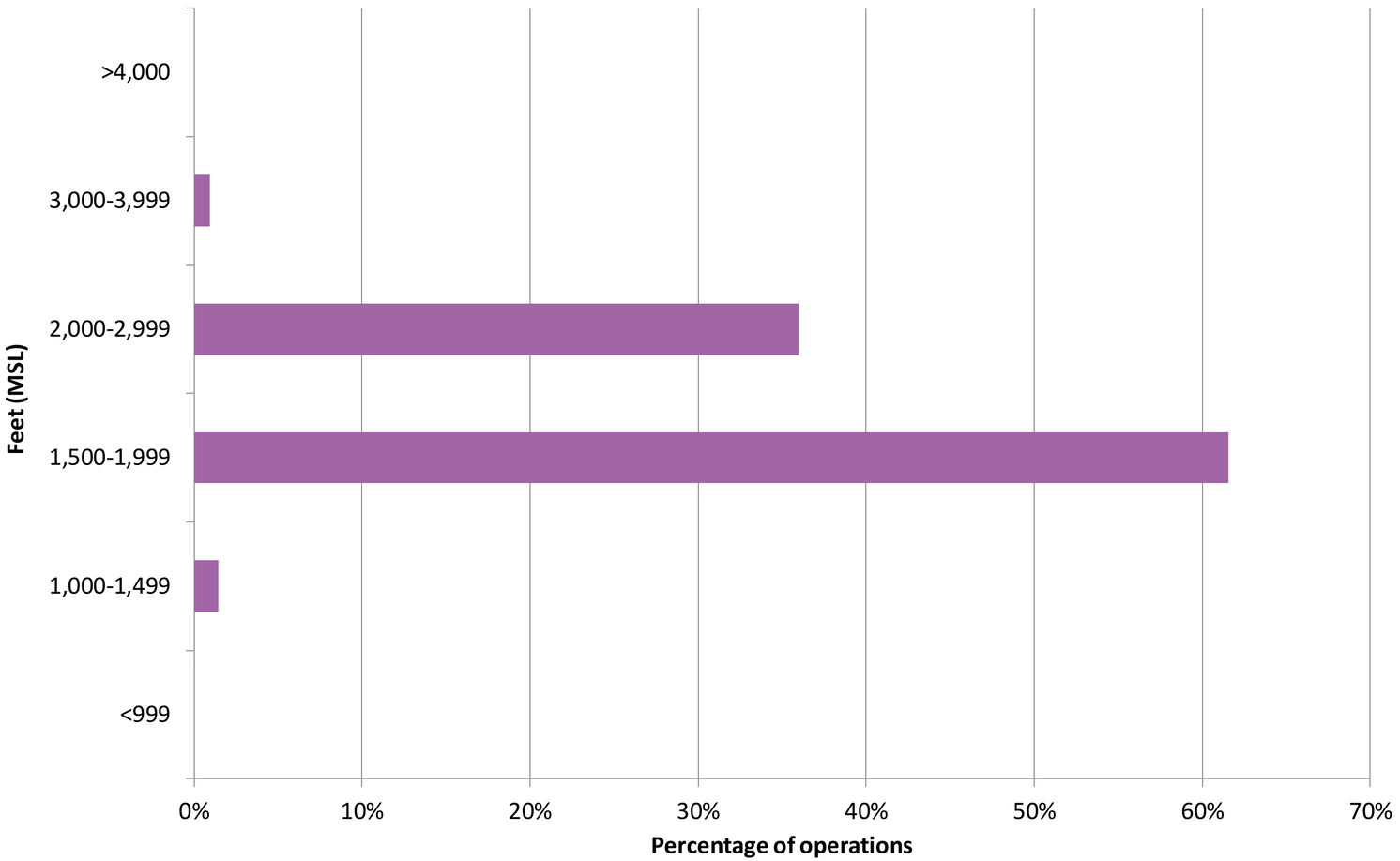
The altitude analysis is split into two parts in this South Luton report – Departures and Arrivals. The bar charts in this section show the concentration of the aircraft when aircraft reach the noise monitor in South Luton. For arrivals, aircraft tend to be at much lower altitude due to the close proximity to the runway at South Luton. The average altitude of aircraft in this area was 939 feet AMSL (414 feet AGL).



Aircraft Type	Number of movements detected	Average Altitude (AMSL in ft)
A306	64	930
A319	990	938
A320 CEO	1585	940
A320 NEO (A20N)	638	940
A321 CEO	804	917
A321 NEO (A21N)	638	940
B737-800 NG (B738)	965	933
B737 Max 8 (B38M)	88	925
Global Express (GLEX)	220	938
Cessna 560X (C56X)	157	953
Gulfstream G560 (GLF6)	105	957
All	7,485	939

Altitude Gate Analysis – Westerly Departures

For departures, the average altitude of aircraft was 1,991 feet AMSL (1,466 feet AGL) when they reach above the noise monitor above Cutenhoe Road in South Luton. The purple bar chart shows majority of the departing flights were above 1,500 feet AMSL. The lighter weight aircraft, Cessna 560X, Gulfstream G650 and Global Express, and A306 achieved higher altitude.



Aircraft Type	Number of movements	Average Altitude (AMSL in ft)
A306	138	2,387
A319	2,339	1,871
A320 CEO	3,598	1,962
A320 NEO (A20N)	1,512	1,986
A321 CEO	1,912	1,973
A321 NEO (A21N)	1,337	1,986
B737-800 NG (B738)	2,166	1,862
B737 Max 8 (B38M)	153	1,778
Global Express (GLEX)	605	2,116
Cessna 560X (C56X)	370	2,368
Gulfstream G560 (GLF6)	232	2,114
All	17,610	1,991

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 South Luton, the noise monitoring terminal collected readings from 6,248 easterly arriving aircraft and 14,962 westerly departing aircraft. During the period, there were 9,164 easterly arrivals and 21,809 westerly departures.

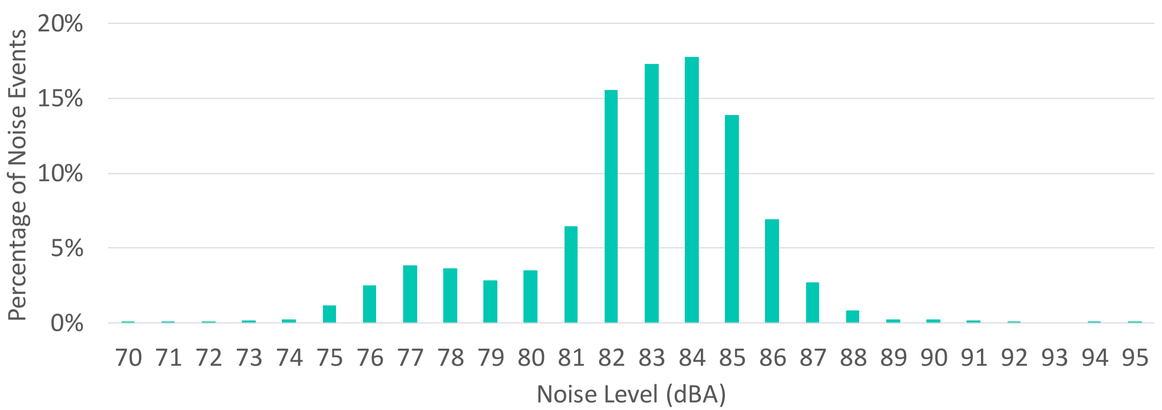
It is noteworthy that the noise monitor may not be able to record every aircraft noise event if the aircraft noise level is below ambient background noise. Therefore, there may be a difference between the number of actual air transport movements and number of aircraft noise events collected during the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

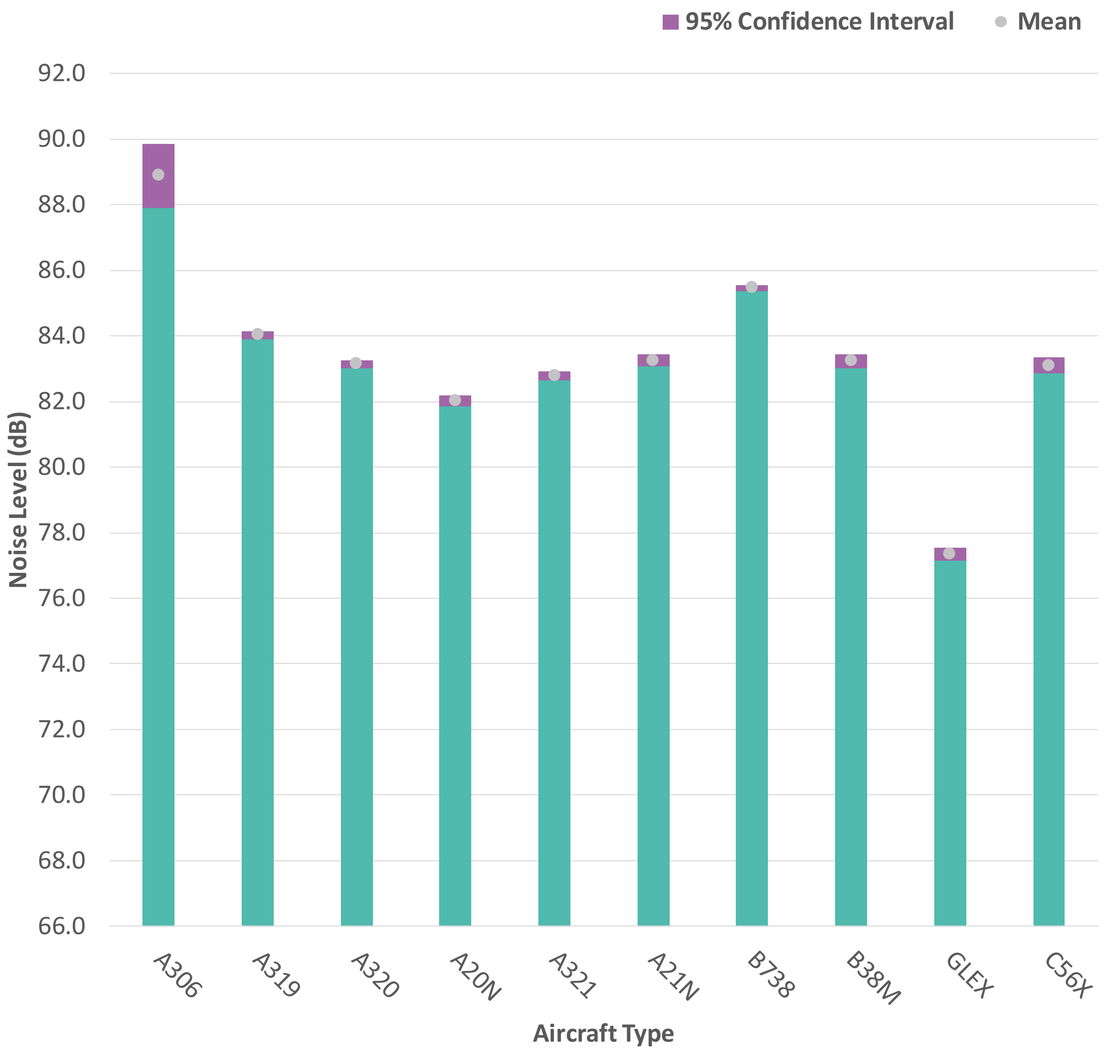
The weather also plays a big part in the data recorded and in periods of extreme weather i.e (very strong winds) the equipment can record noise incorrectly so we exclude samples from the analysis during these weather conditions. When analysing the samples, the first thing we do is to ensure that there is no unusual noise event present which might not be caused by aircraft (i.e. vehicles or wildlife). Some recordings 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	48	88.9
A319	821	84.0
A320 CEO	1,330	83.1
A320 NEO (A20N)	529	82.0
A321 CEO	672	82.8
A321 NEO (A21N)	465	83.3
B737-800 NG (B738)	807	85.5
B737 Max 8 (B38M)	71	83.2
Global Express (GLEX)	184	77.3
C56X	131	83.1
All Aircraft Types	6,248	82.5

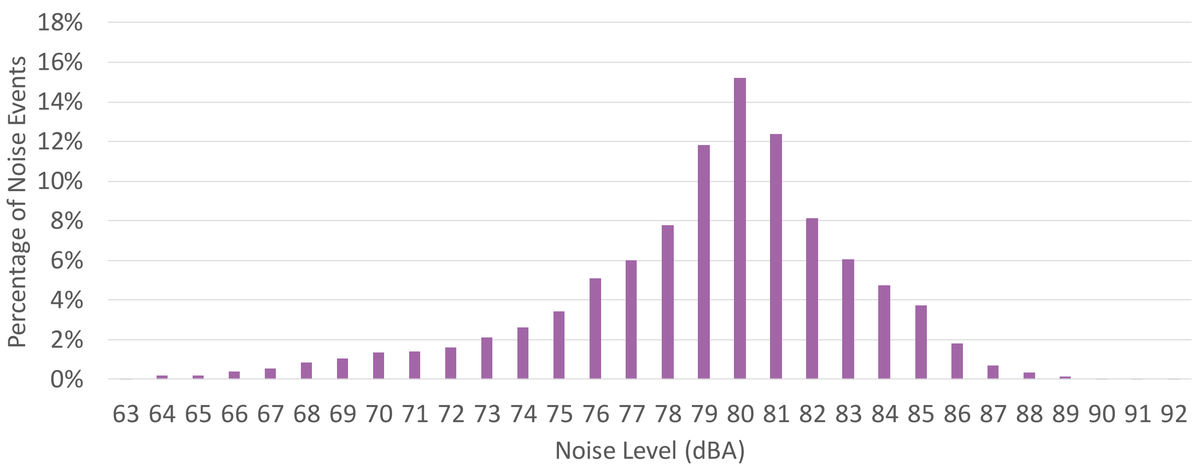


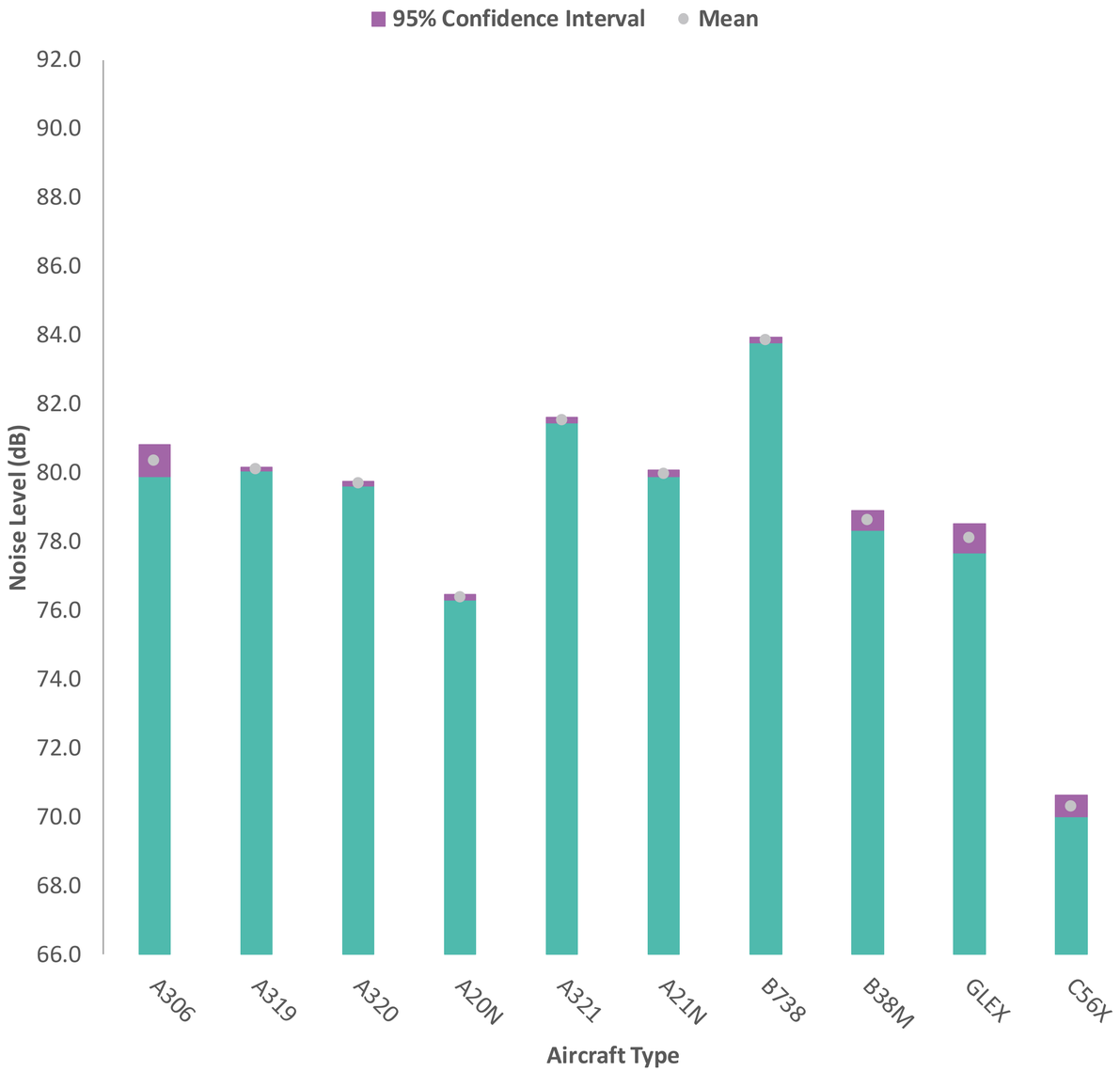


*The noise results shown in the analysis are only for those aircraft types that recorded more than 100 events per aircraft (A306 and B737 Max 8 included for comparison).

Noise Results – Westerly Departures

Aircraft Type*	Number of movements	Average Noise (dB)
A306	121	80.3
A319	1,970	80.1
A320 CEO	3,113	79.7
A320 NEO (A20N)	1,284	76.4
A321 CEO	1,629	81.5
A321 NEO (A21N)	1,150	80.0
B737-800 NG (B738)	1,850	83.8
B737 Max 8 (B38M)	129	78.6
Global Express (GLEX)	510	78.1
C56X	315	70.3
All Aircraft Types	14,962	79.1





*The noise results shown in the analysis are only for those aircraft types that recorded more than 200 events per aircraft (A306 and B737 Max 8 included for comparison).

Noise Results - Summary

- On Cutenhoe Road in South Luton, residents 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 82.5dB, based on a sample size of 6,248. On westerly operation, the average departure noise measured was 79.1dB, based on a sample size of 14,962.

- From the results, Luton's most popular aircraft type, Airbus A320 CEO, had an average noise of 83.1dB (arrival) and 79.7dB (departure).

- The departure noise from the newer generation aircraft, A320 NEO, produced less noise than A320 CEOs, at an average of between 1.1dB and 3.1dB quieter for arrivals and departures respectively. Similar for the Boeing 737 series, the new B737 Max 8 was averaging between 2.3-5.2dB quieter than its predecessor B737-800NG, despite the Max departures flew at slightly lower altitude. In the sample, 17% of the movements were newer generation aircraft which are more fuel efficient and quieter. Comparing to previous years, the NEO typed aircraft accounted for 6% and 18% of all air transport movements in 2020 and 2021 respectively.

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

- LLA monitored aircraft noise at the same location in the beginning of the year. The results show that the average aircraft noise is nosier in the summer months. Also, the aircraft movements are more frequent than the beginning of the year so residents in South Luton may notice more noise disturbance.

Conclusion

- A mobile noise monitor was installed at a residential property on Cutenhoe Road for four months period.

- 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 29% and 71% 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 1,991 feet above mean sea level (AMSL), and as South Luton is already approximately 525 feet AMSL, aircraft will typically be at 1,466 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 83.1dB and 79.7dB for easterly arrival and westerly departure respectively.

- 17% 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 76.4dB, 3.3dB lower than A320 CEOs. More noticeably, the B737 Max 8 was significantly quieter than its predecessor B737-800NG with a difference of 5.2dB for departures. However, the sample size is still small when the noise monitor was in placed in South Luton. In future years, operators continue to increase the utilisation of these quieter and more fuel-efficient aircraft in Luton.

- 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 South Luton and other areas along the 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.

- During the period, 116 departure aircraft (both westerly and easterly) were investigated as part of the Noise and Track violation scheme. 21 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

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 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.

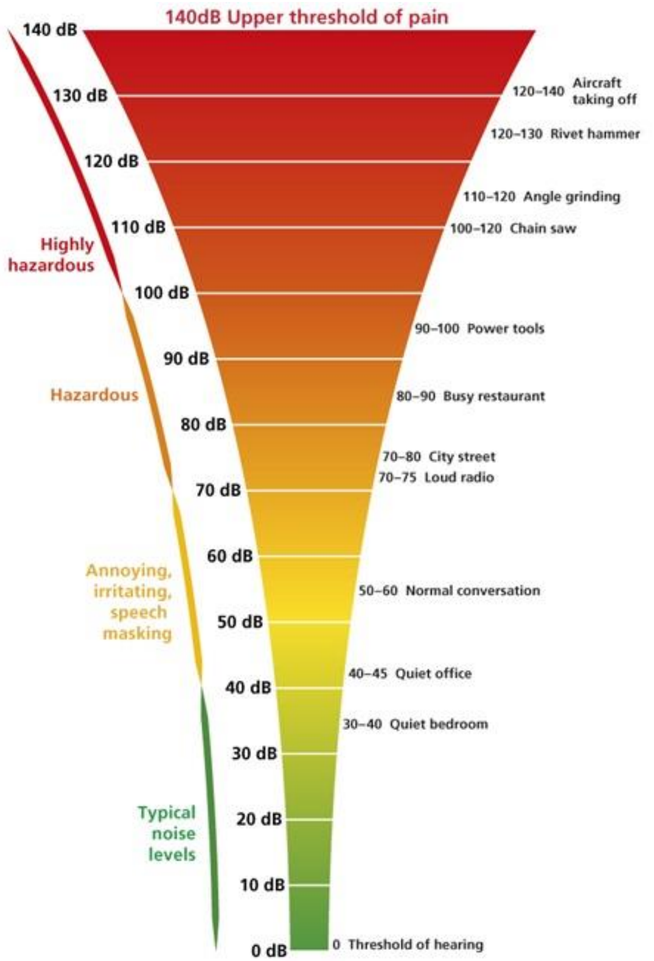
Altitude Gate Analysis: A gate which is drawn across an area and will gather flight date about every aircraft passing through the gate area.

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.



Source: iosh.co.uk