# Community Noise Report

South Luton

June- September 2024

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 arrival and departures flightpath is shown on the map.**

The noise monitor was located at a residential property on Wilsden Avenue, to the north of Stockwood park, at an altitude of 539 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 18th June- 9th September 2024.

Aircraft noise and tracks recorded were extracted from LLA's noise and track-keeping system.

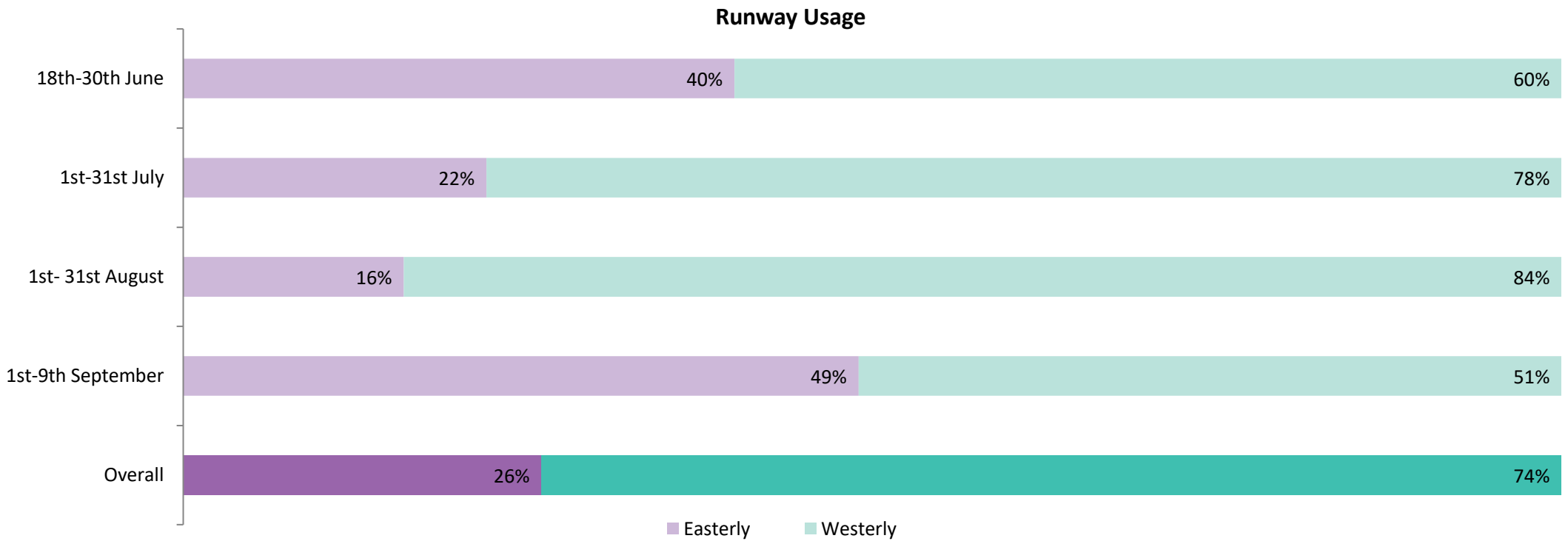
This document evaluates the lateral and vertical positioning of aircraft near the monitor as well as the noise recorded at ground level.

# 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.

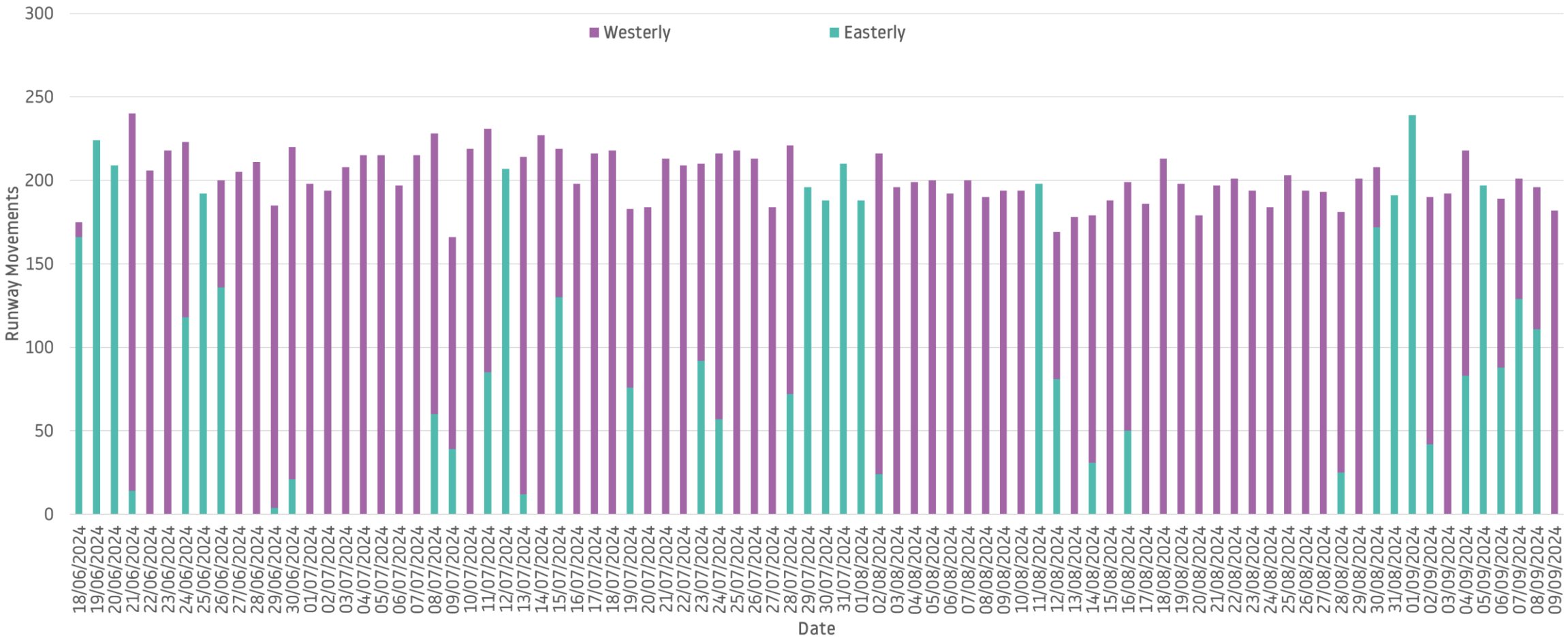
During the period of monitoring, the direction of operation was 26% Easterly and 74% Westerly. The 5-year average for this time of year is 30% easterly vs 70% westerly.

There were 4,665 aircraft arriving on the easterly route and 12,420 westerly departure aircraft in Q3 2024.



# Daily Movements during monitoring period

The chart below shows the number of daily easterly and westerly operations. Due to the location, all flights that arrived on our easterly runway and departed from our westerly runway would have flown near the noise monitor terminal. The graph shows the westerly operations (purple) as well as easterly operations (green) on the other side.

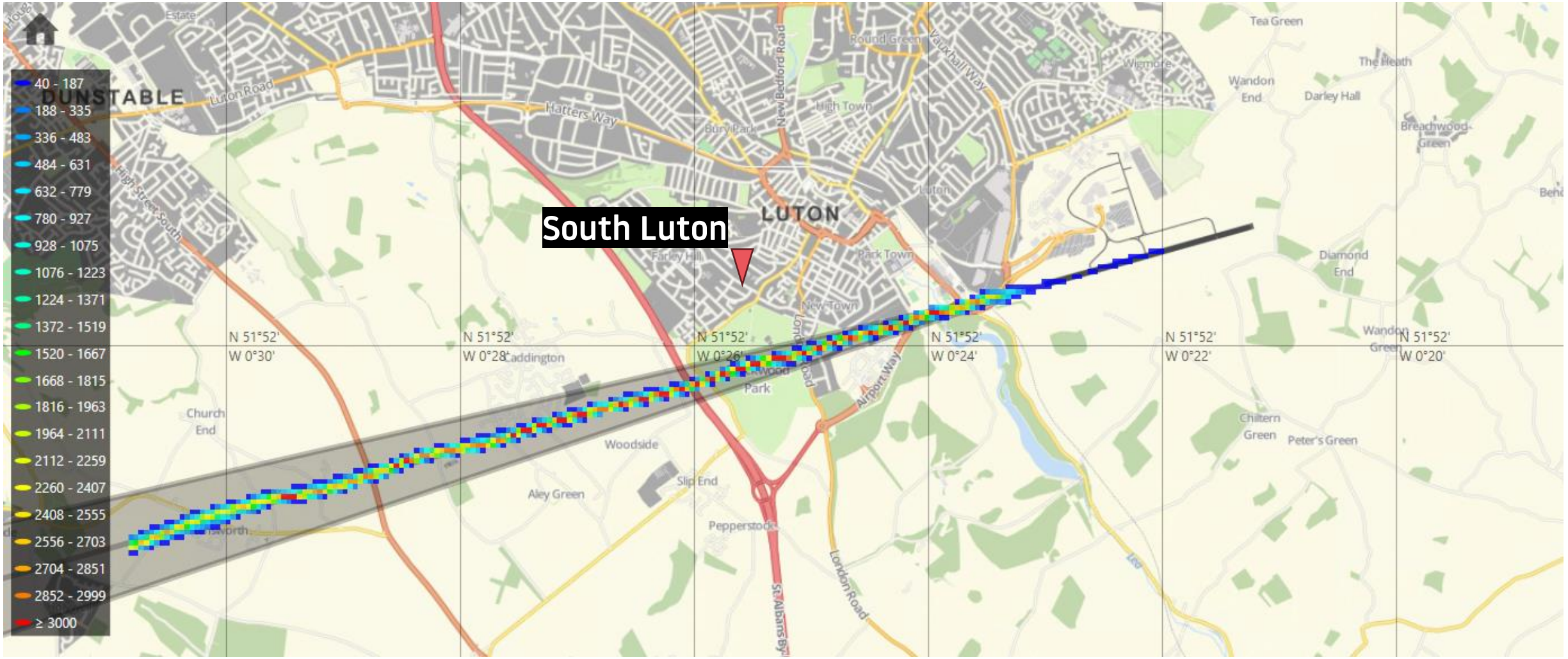


# Operations during monitoring period

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 departure operations and 7 am on arrival operations. These aircraft would be lower at altitude and more noticeable as the dwellings at this location are near the westerly departure flightpath. During the night period of 23:00 – 06:00 in the monitoring period, there were an average of 43 arrivals and 11 departures.

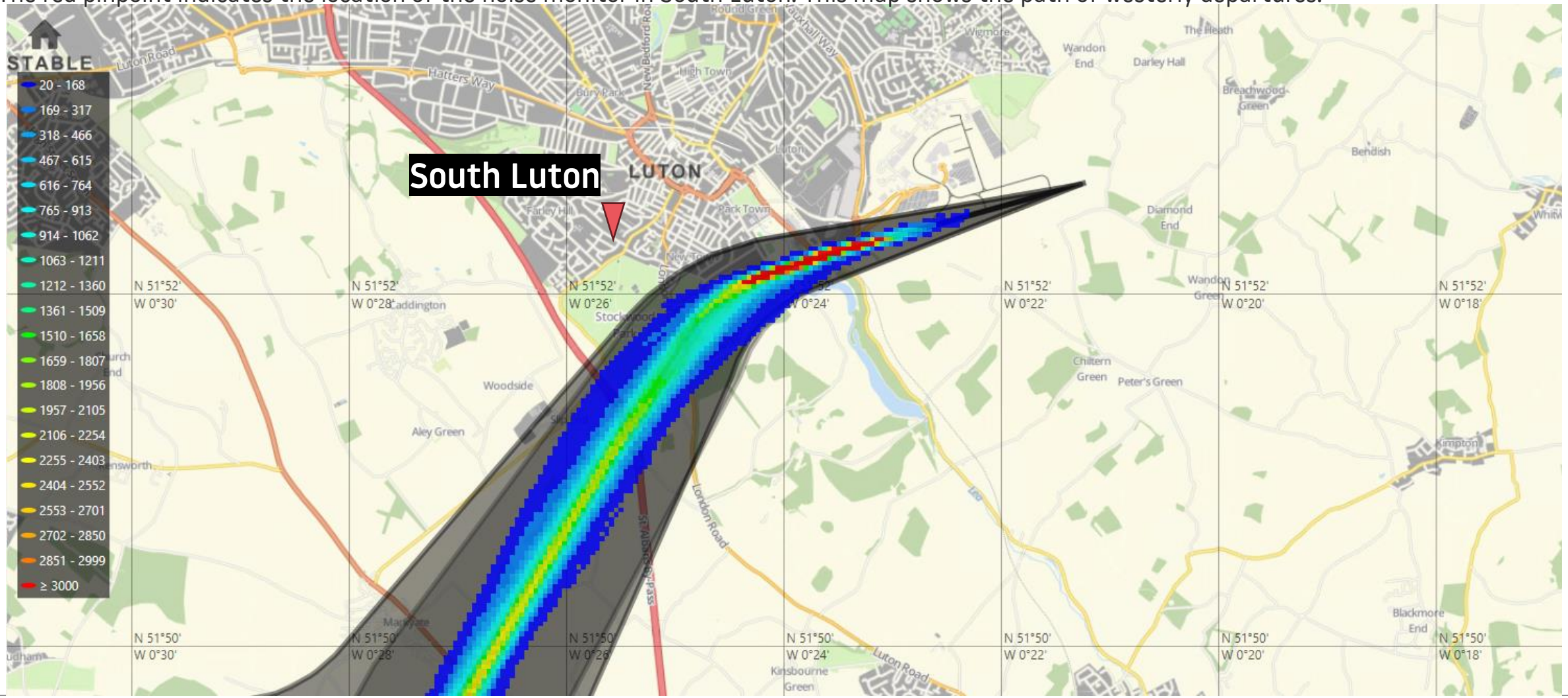
# Aircraft Tracks- Easterly Arrivals

The heat map below shows 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 map shows the path of easterly arrivals.



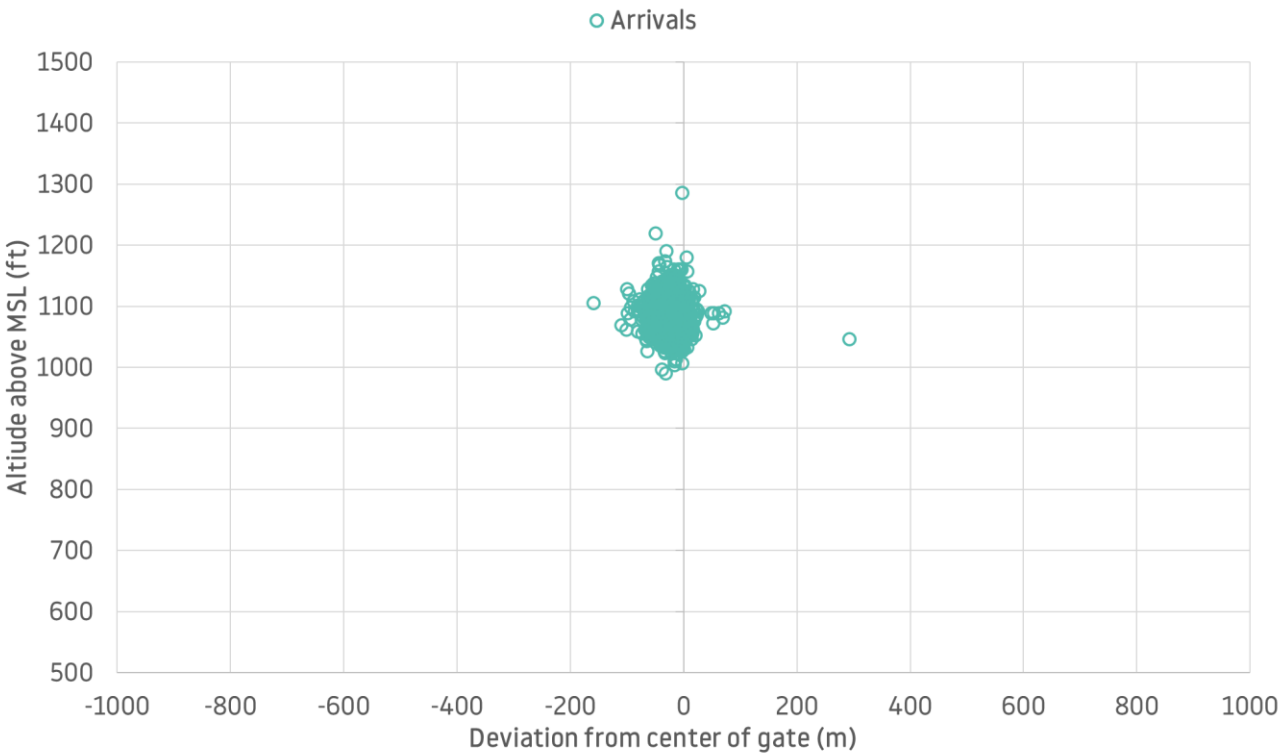
# Aircraft Tracks- Westerly Departures

The heat map below shows 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 map shows the path of westerly departures.



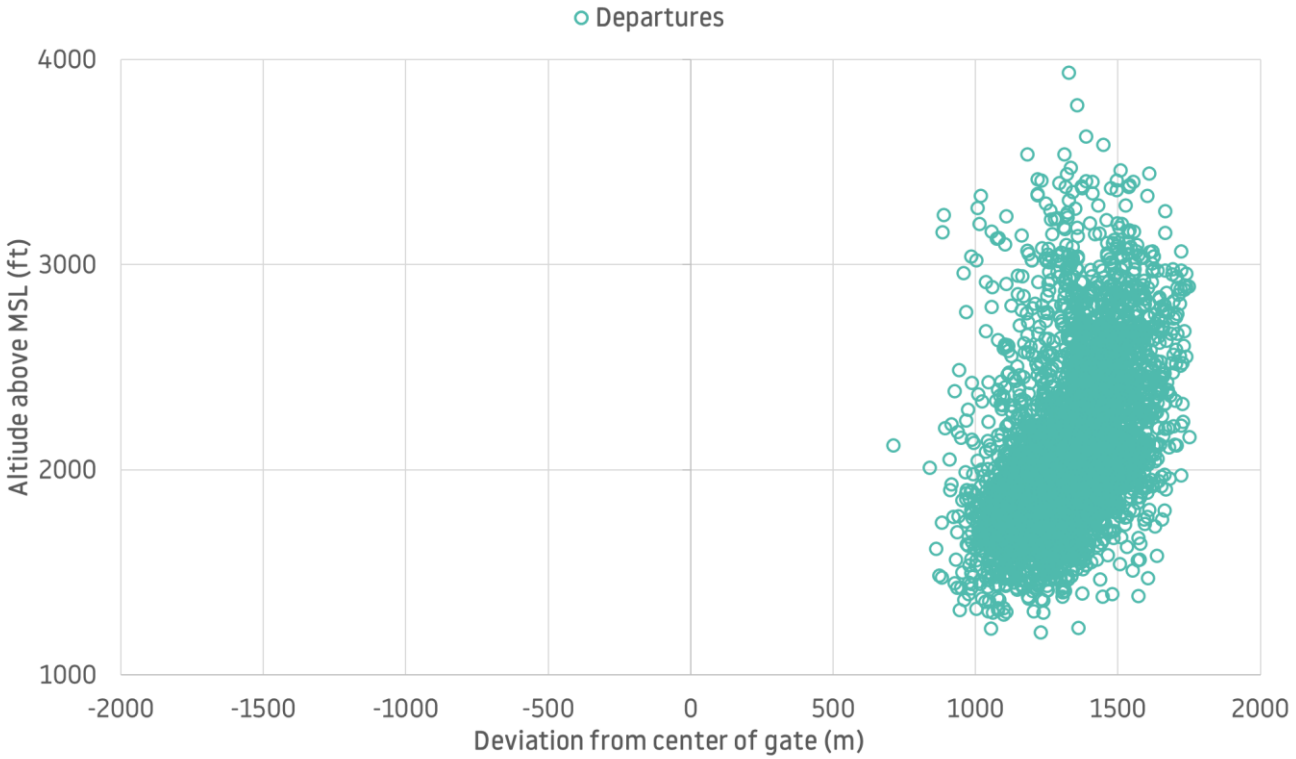
# Altitude Gate Analysis- Easterly Arrivals

The altitude analysis for South Luton, shows the vertical and lateral dispersion of aircraft 1km either side of the noise monitor. The map below shows the 2km gate (blue line) 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. Residents in South Luton will see arrival aircraft flying on the days of easterly operations.

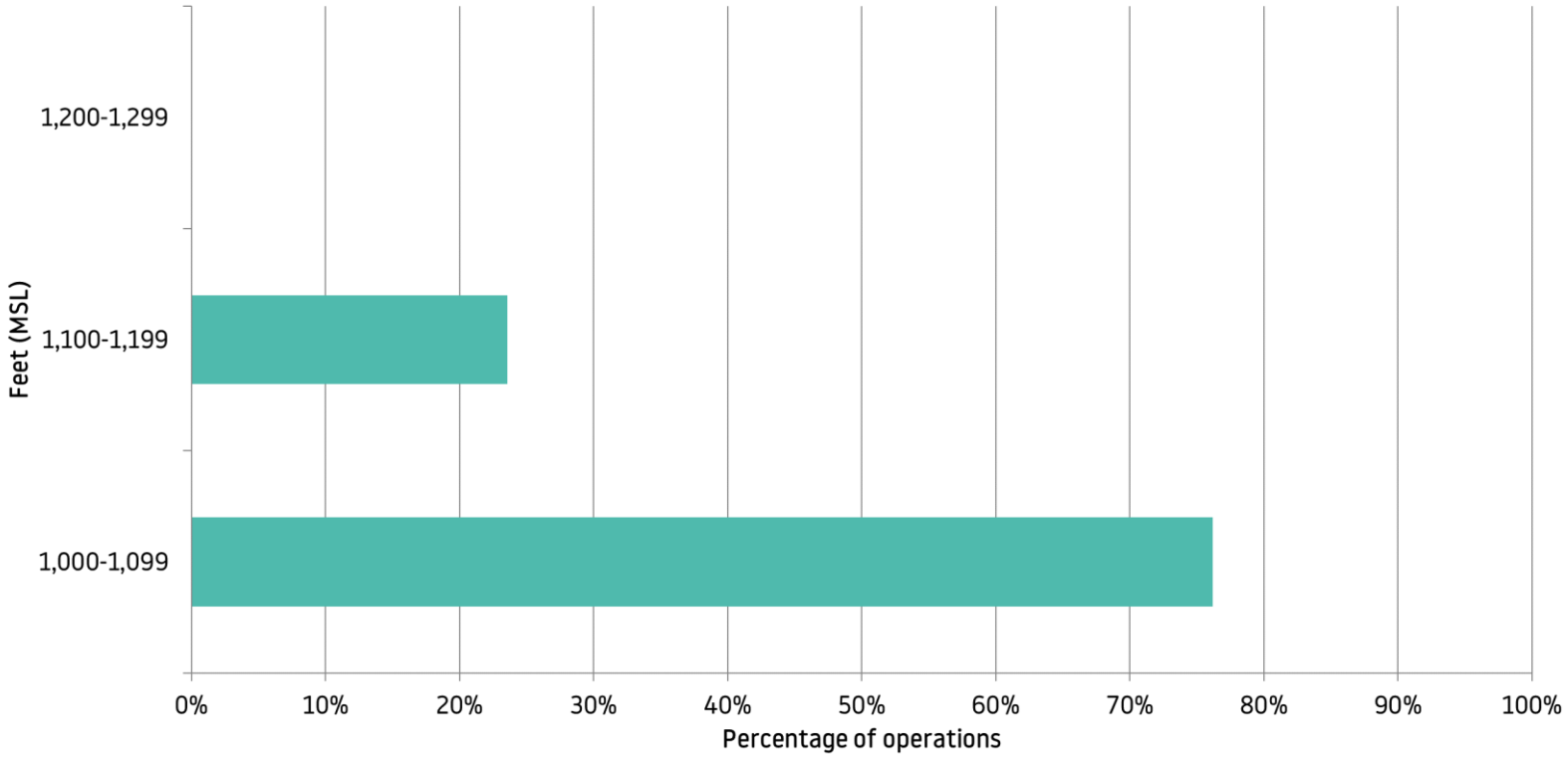
# Altitude Gate Analysis- Westerly Departures

The altitude analysis for South Luton, shows the vertical and lateral dispersion of aircraft 1.75km either side of the noise monitor. The map below shows the 3.5km gate (blue line) 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. Residents in South Luton will see aircraft departing on the days of westerly operations. The edge of the NPR is around +625m from the noise monitor in the centre of the gate.

# Altitude Gate Analysis – Easterly Arrivals

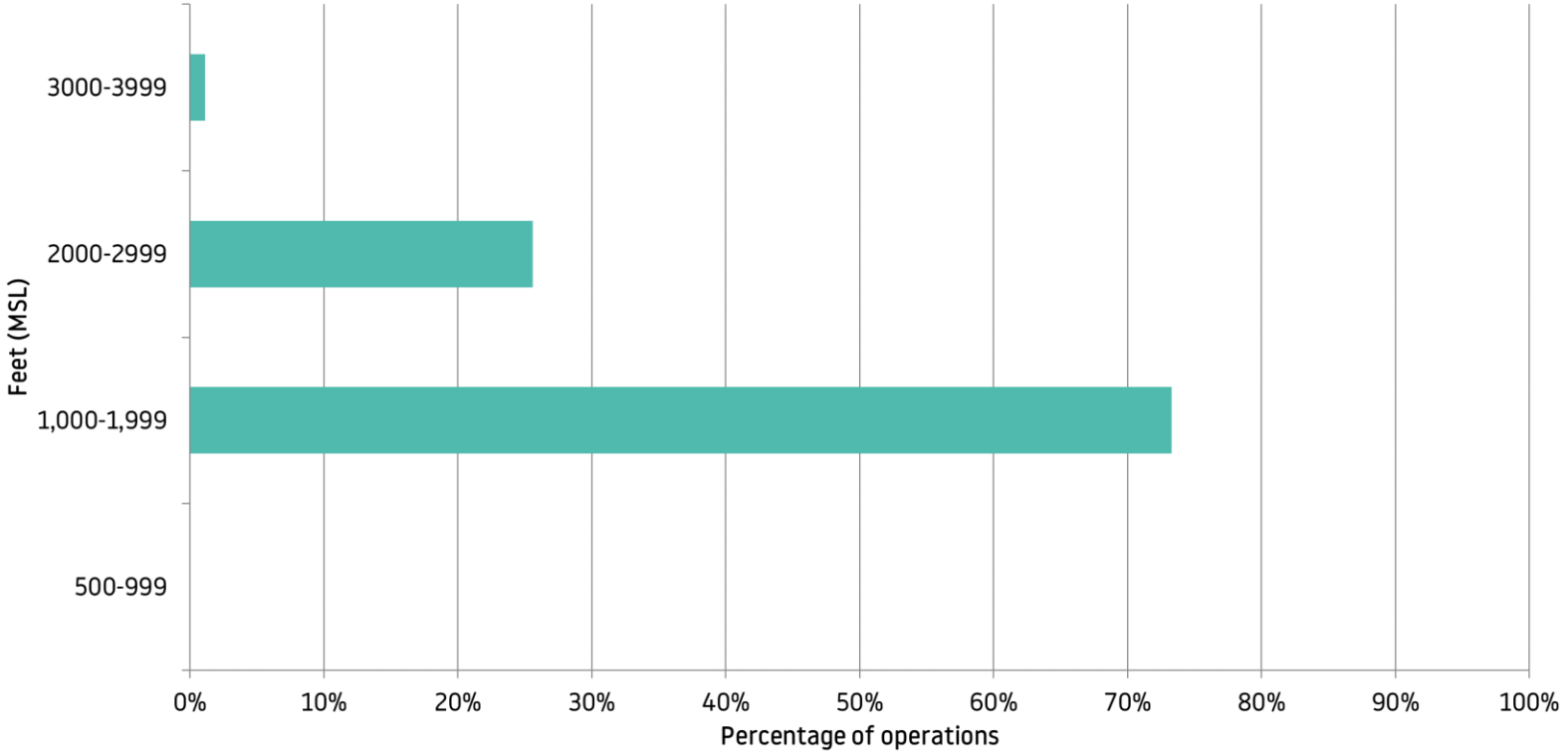
The average altitude of aircraft was 1,087 feet AMSL (548 feet AGL) when they reach near the noise monitor in South Luton. The bar chart on the below shows the percentage rate and altitude of aircraft arriving.




| Aircraft Type | Number of movements detected | Average Altitude (AMSL in ft) |
|---|---|---|
| A306 | 29 | 1,083 |
| A319 | 592 | 1,093 |
| A320 CEO | 547 | 1,087 |
| A320 NEO (A20N) | 527 | 1,088 |
| A321 CEO | 149 | 1,066 |
| A321 NEO (A21N) | 676 | 1,093 |
| B737-800 NG (B738) | 290 | 1,079 |
| B737 Max 8 (B38M) | 213 | 1,079 |
| Global Express (GLEX) | 92 | 1,106 |
| Cessna 560X (C56X) | 72 | 1,091 |
| All | 3,187 | 1,087 |

# Altitude Gate Analysis – Westerly Departures

The average altitude of aircraft was 2,019 feet AMSL (1,480 feet AGL) when they reach near the noise monitor in South Luton. The bar chart on the below shows the percentage rate and altitude of aircraft arriving.




| Aircraft Type | Number of movements detected | Average Altitude (AMSL in ft) |
|---|---|---|
| A306 | 88 | 2,425 |
| A319 | 1,759 | 1,825 |
| A320 CEO | 1,661 | 1,919 |
| A320 NEO (A20N) | 1,544 | 1,917 |
| A321 CEO | 415 | 1,979 |
| A321 NEO (A21N) | 2,041 | 1,866 |
| B737-800 NG (B738) | 901 | 1,873 |
| B737 Max 8 (B38M) | 635 | 1,853 |
| Global Express (GLEX) | 290 | 2,126 |
| Cessna 560X (C56X) | 216 | 2,403 |
| All | 9,550 | 2,019 |

# 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 13,363 readings. During the period, there were 4,357 easterly arrivals and 12,588 westerly departures

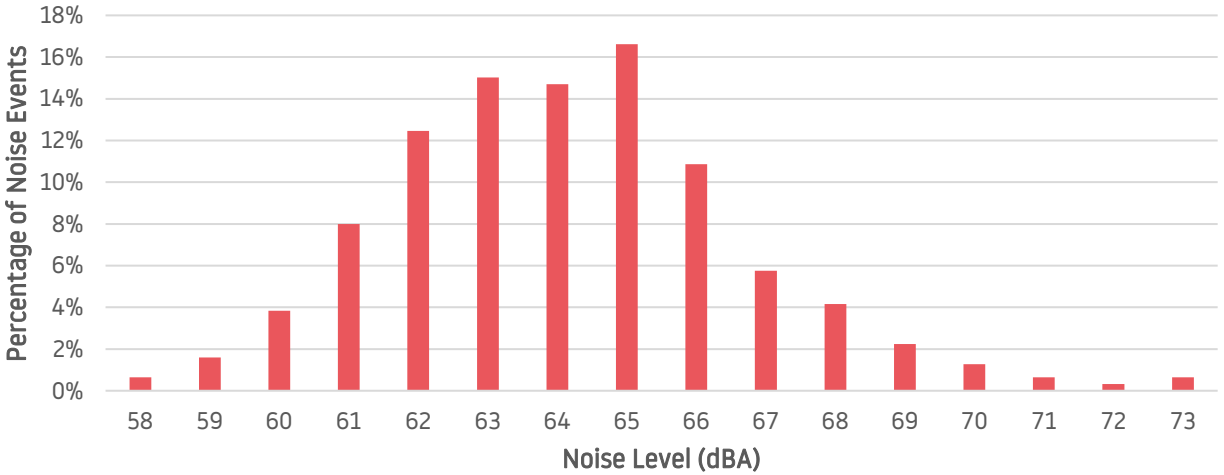
It is noteworthy that the noise monitor may not be able to record every aircraft noise event if the aircraft noise level is below ambient background noise or aircraft following a different route and not through the gate selected. Therefore, there may be a difference between the number of actual air transport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

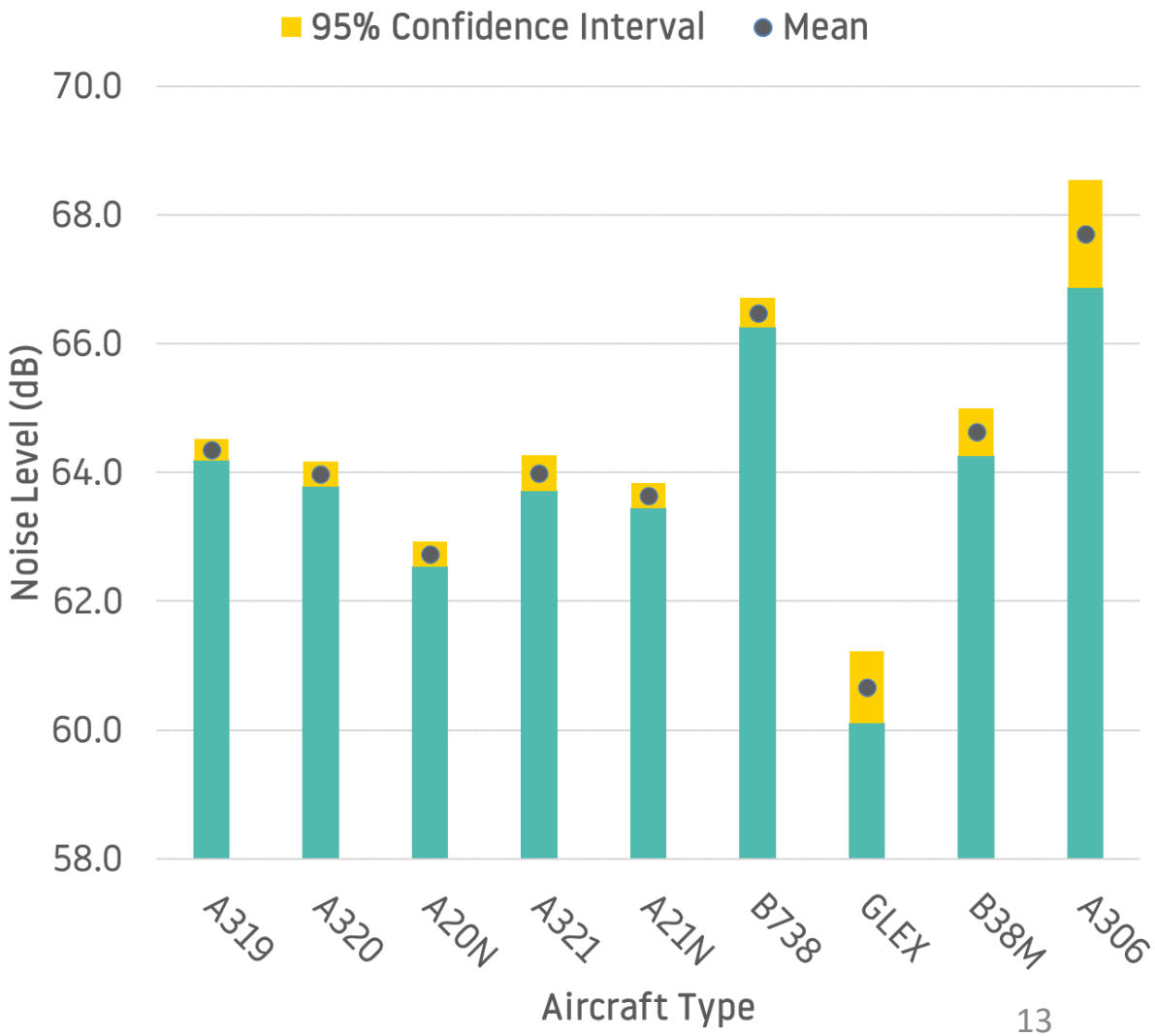
The weather also plays a big part in the data recorded and in periods of extreme weather i.e (very strong winds) the equipment can record noise incorrectly, so we exclude samples from the analysis during these weather conditions. When analysing the samples, the first thing we do is to ensure that there is no unusual noise event present which might not be caused by aircraft (i.e. vehicles or wildlife). A total of 4,386 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) |
|---|---|---|
| A319 | 531 | 64.4 |
| A320 CEO | 498 | 64.0 |
| A320 NEO (A20N) | 475 | 62.7 |
| A321 CEO | 140 | 64.0 |
| A321 NEO (A21N) | 599 | 63.6 |
| B737-800 NG (B738) | 263 | 66.5 |
| GLEX | 43 | 60.7 |
| B737 Max 8 (B38M) | 198 | 64.6 |
| A306 | 25 | 67.7 |
| All | 2,772 | 64.2 |



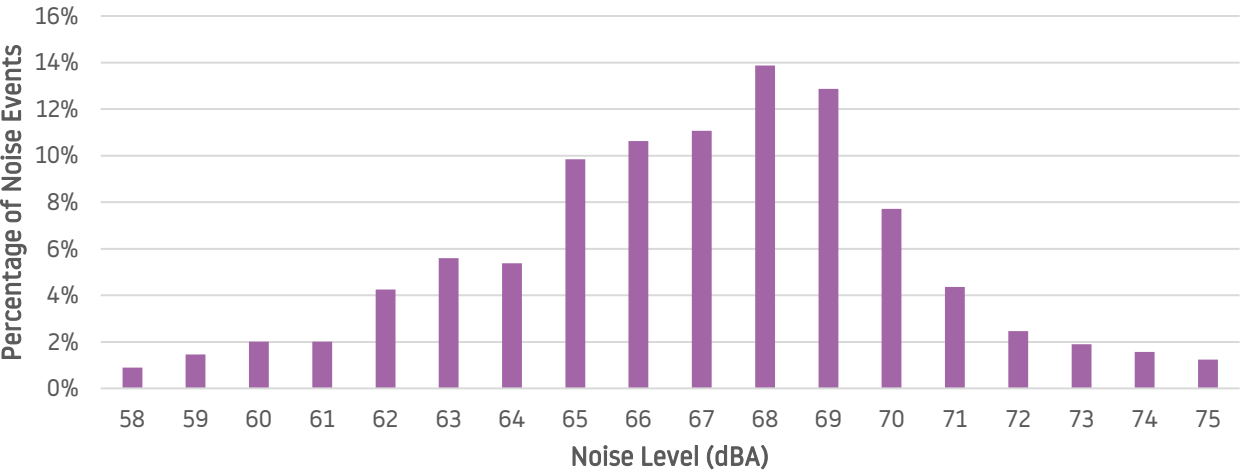



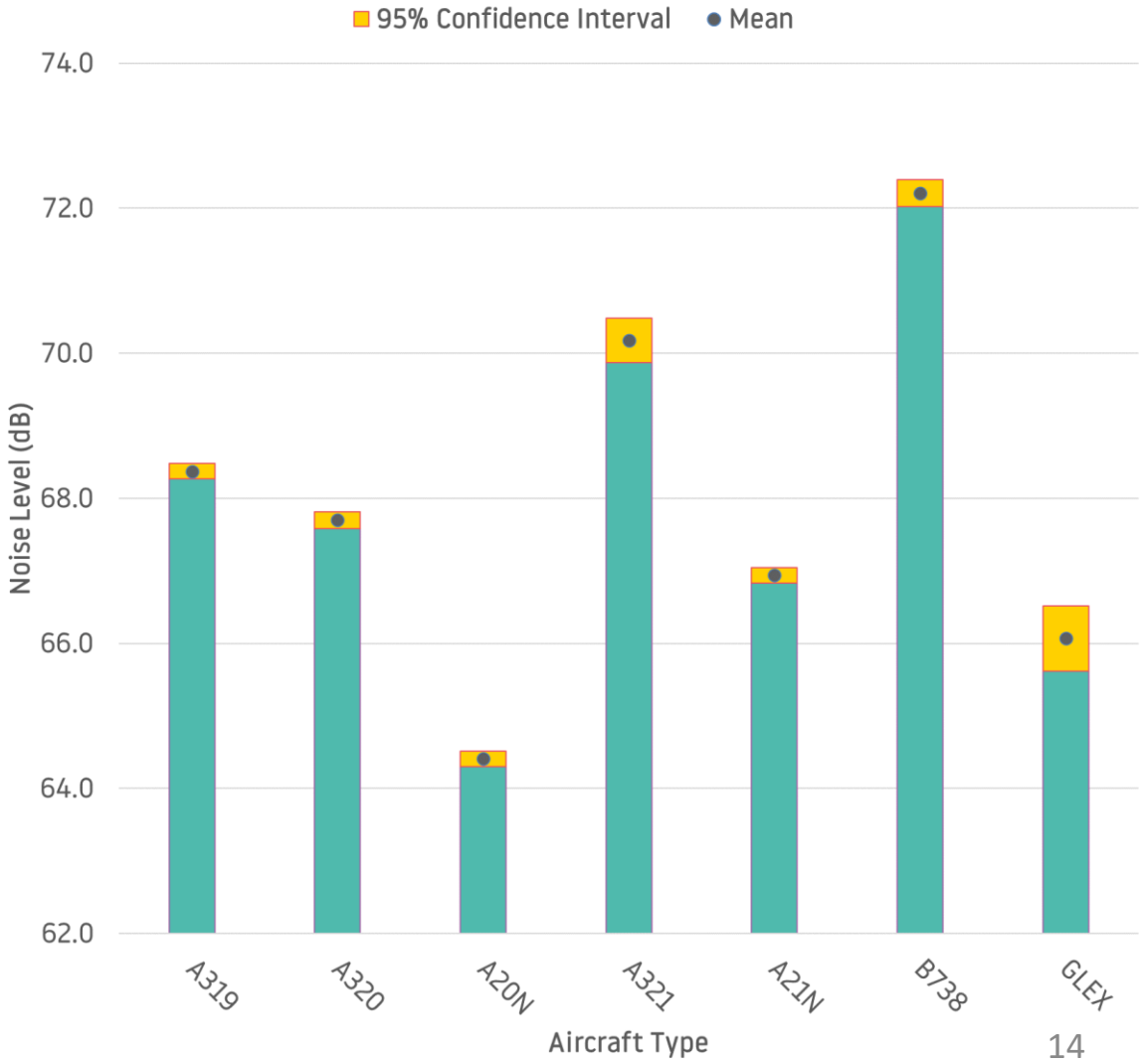

*The noise results shown in the analysis are only for those aircraft types that recorded more than 40 events per aircraft. A306 included for comparison.

# Noise Results – Westerly Departures

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 | 1,455 | 68.4 |
| A320 CEO | 1,396 | 67.7 |
| A320 NEO (A20N) | 1,261 | 64.4 |
| A321 CEO | 340 | 70.2 |
| A321 NEO (A21N) | 1,682 | 66.9 |
| B737-800 NG (B738) | 738 | 72.2 |
| B737 Max 8 (B38M) | 521 | 66.5 |
| A306 | 77 | 69.4 |
| GLEX | 218 | 66.1 |
| All | 7,688 | 67.7 |




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

# Noise Results - Summary

- The average arrival noise in South Luton was 64.2dB, based on a sample size of 2,772. The average departure noise in South Luton was 67.7dB, based on a sample size of 7,688.

- From the results, South Luton's most popular aircraft type by operators include Airbus and Boeing.

- Airbus operate the A320 CEO, A321 CEO and Boeing the B738-800NG.
- Both Airbus and Boeing also operate the newer generation aircraft. Airbus- A320 NEO (A20N) and A321 NEO (A21N). Boeing- operate the new B737 Max 8.
- These newer generation aircraft are quieter and more fuel efficient which also impacts the reduction in emissions.

- The table below shows the 6 types of aircraft operated by Airbus and Boeing, with three of the aircraft A20N, A21N and B38M being the newer and more efficient aircraft. It breaks down these results by showing both their arrival and departure decibel (dB) levels. In red it shows the difference between the older and newer generation aircraft in their arrivals and departures.
- Around 46% of all noise results movements were newer generation aircraft which are more fuel efficient and quieter.

| Aircraft type | Arrival dB | Departure dB | New aircraft type | Arrival dB | Departure dB |
|---|---|---|---|---|---|
| **A320** | 64.0dB | 67.7dB | **A320N (A20N)** | 62.7dB (-1.3dB) | 64.4dB (-3.3dB) |
| **A321** | 64.0dB | 70.2dB | **A321N (A21N)** | 63.6dB (-0.4dB) | 66.9dB (-3.3dB) |
| **B738** | 66.5dB | 72.2dB | **B737 MAX8 (B38M)** | 64.6dB (-1.9dB) | 66.5dB (-5.7dB) |

# Conclusion

- A mobile noise monitor was installed at a residential property on Wilsden Avenue from the 18th June- 9th September.
- For South Luton, it specifically related to easterly arrivals and westerly departures. During the monitoring period, the airport operated in the direction of easterly and westerly for 26% and 74% 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 main aircraft type operating at London Luton Airport in this period was the Airbus A321 NEO (A21N) which produced an average noise of 63.6dB for arrivals and 66.9dB for departures.
- 46% 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 64.4dB, 3.3dB lower than A320 CEOs and an average arrival noise of 62.7, 1.3dB lower.
- During the monitoring period, 60 aircraft were investigated as part of the Noise and Track violation scheme. Of these, 9 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.