Community Noise Report

Impington

February- June 2024

London Luton Airport

Introduction

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

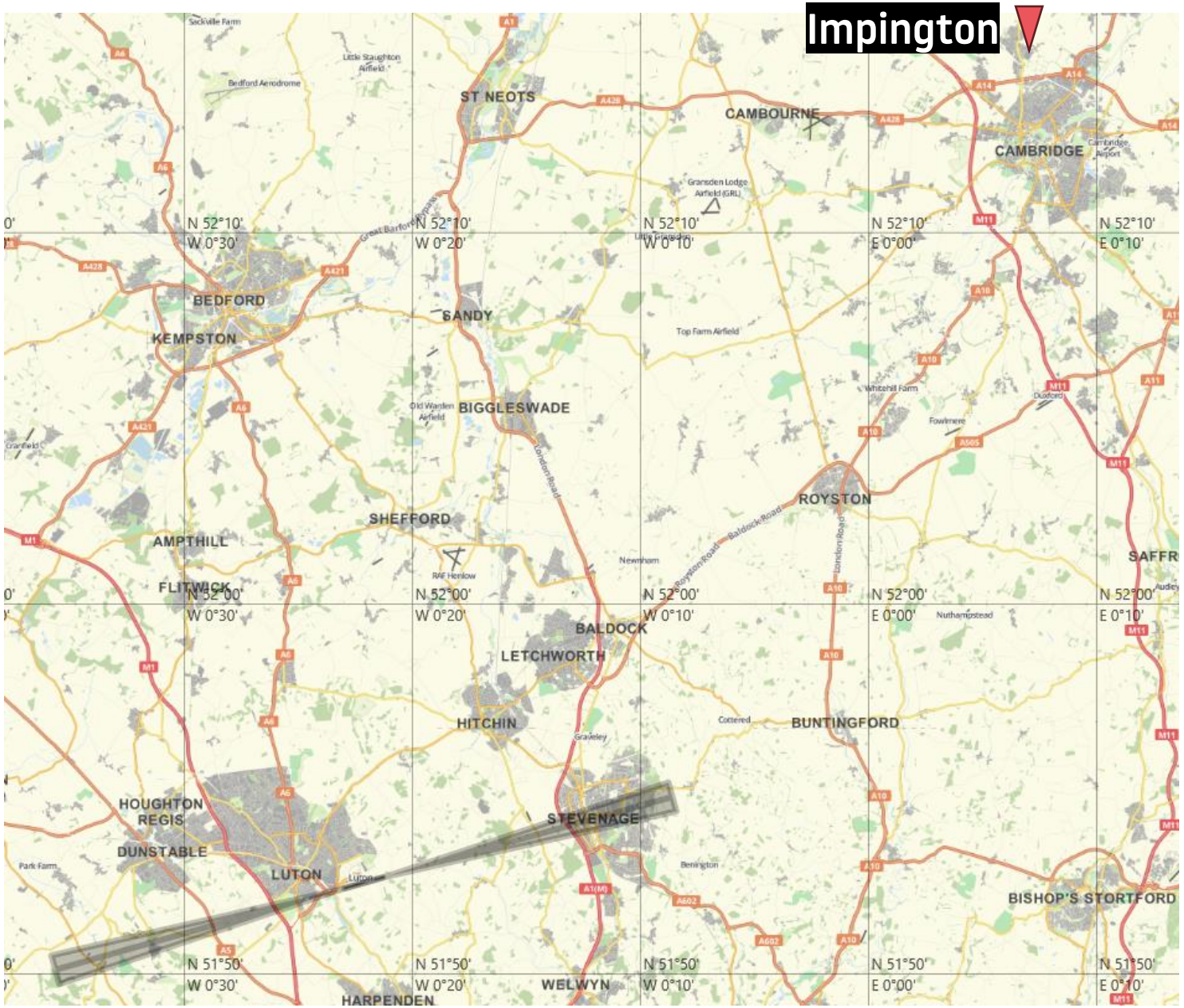
The purpose of the monitoring programme is to understand the typical noise levels created in the local community. **For Impington it specifically related to easterly and westerly arrivals. The arrival flightpaths are shown on the map.**

The noise monitor was located at a residential property on Roselea, below the arrival's routes, at an altitude of 52 feet above sea level. Arrivals will travel anti-clockwise around Cambridge before travelling south to Luton airport. The red pinpoint on the map shows the noise monitor location.

The noise monitor in Impington was in place between
the 13th February and 7th June 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.

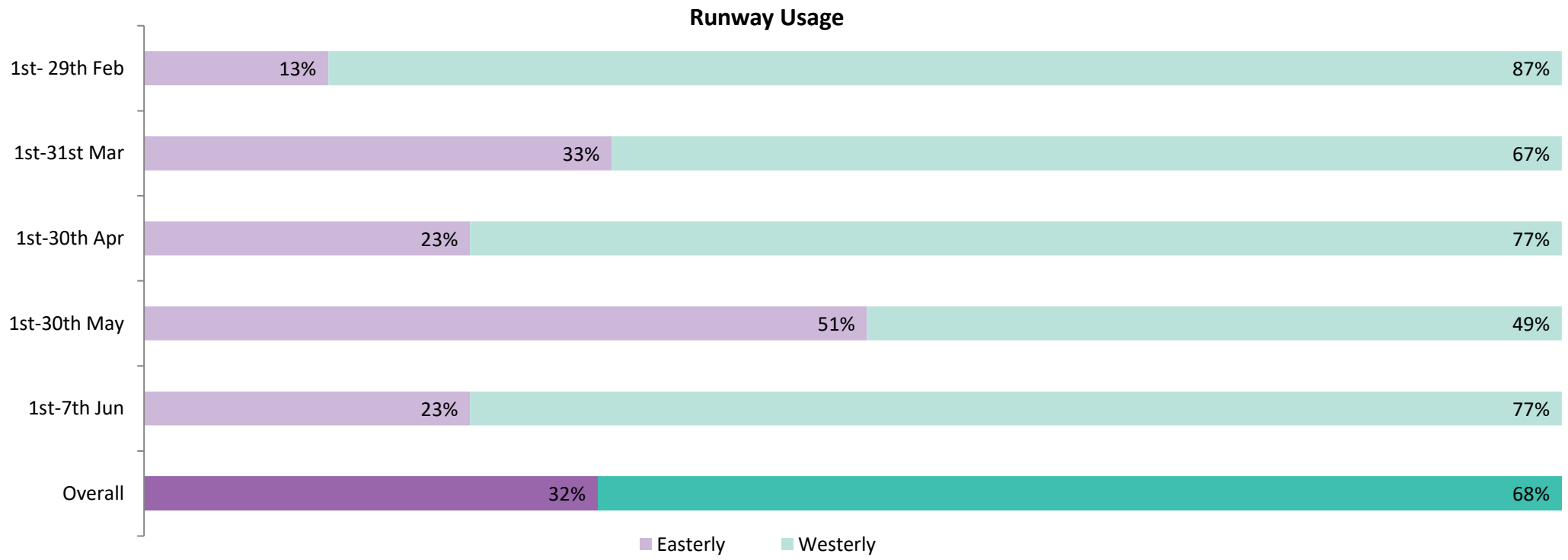


LLA operations during the monitoring period

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.

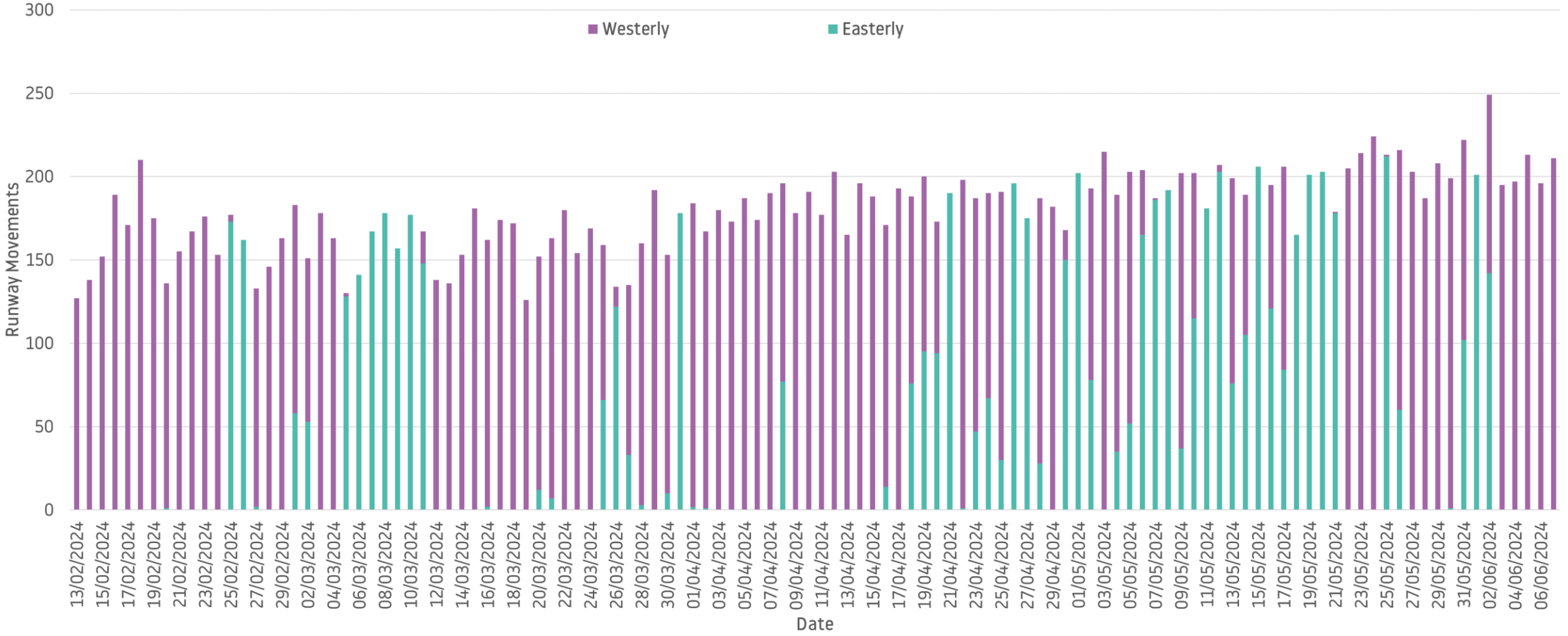
During the period of monitoring, the direction of operation was 32% Easterly and 68% Westerly. The 5-year average for this time of year is 36% easterly vs 64% westerly.

There were 13,868 aircraft arriving in Q1 2023 and 18,005 in Q2 2024.



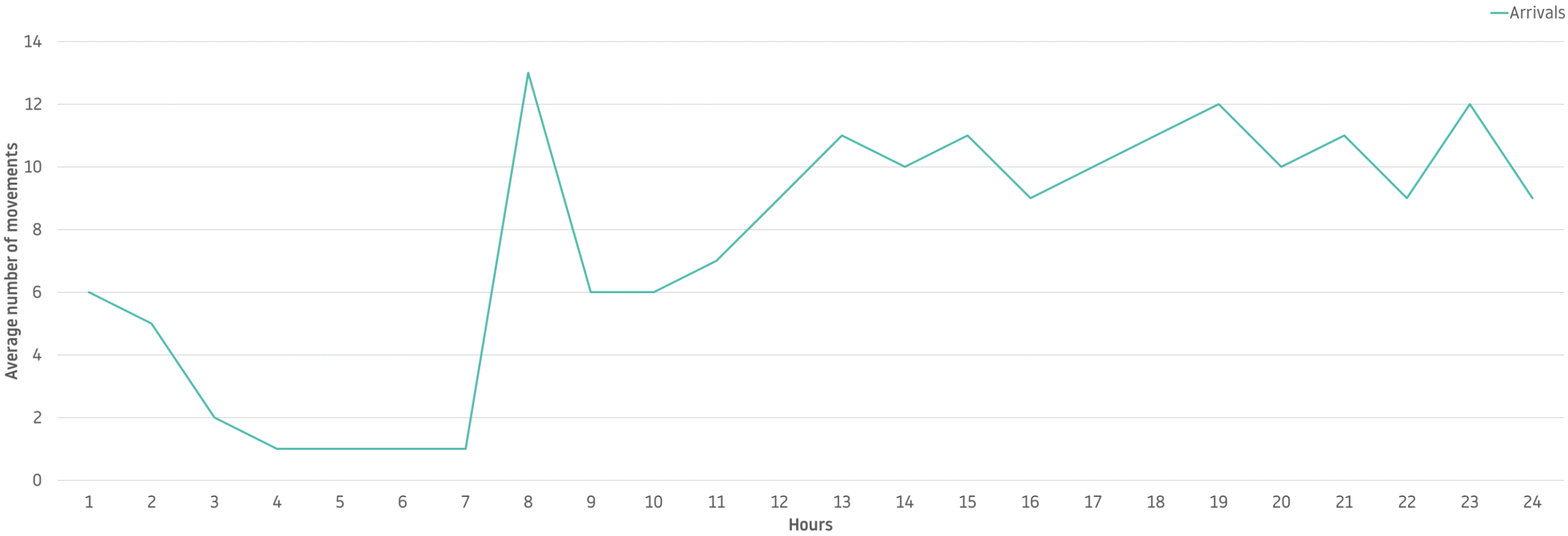
Daily Movements during monitoring period

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



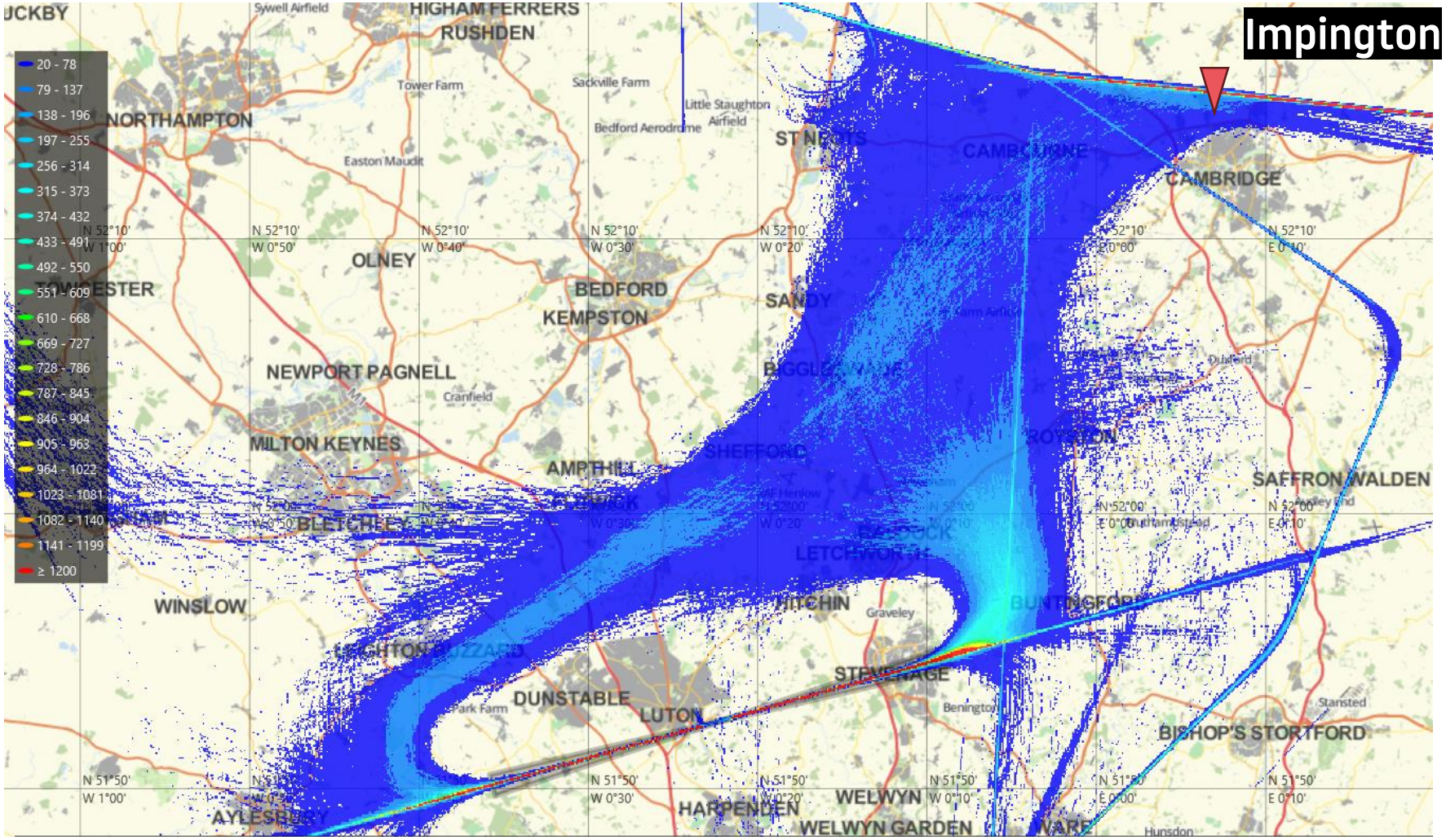
Operations during monitoring period

The graph below represents the average aircraft movement by hours during the monitoring period. Depending on the operating direction on the day, residents in Impington may experience different flight patterns. During the peak periods, residents of Impington may notice more frequent aircraft movements. In general, the morning peak starts at 7am on the days of easterly and westerly arrival operations and these aircraft would be lower at altitude and more noticeable as the dwellings at this location are just next to the westerly departure flightpath. During the night period of 23:00 – 06:00 in the monitoring period, there were average of 7 departures.



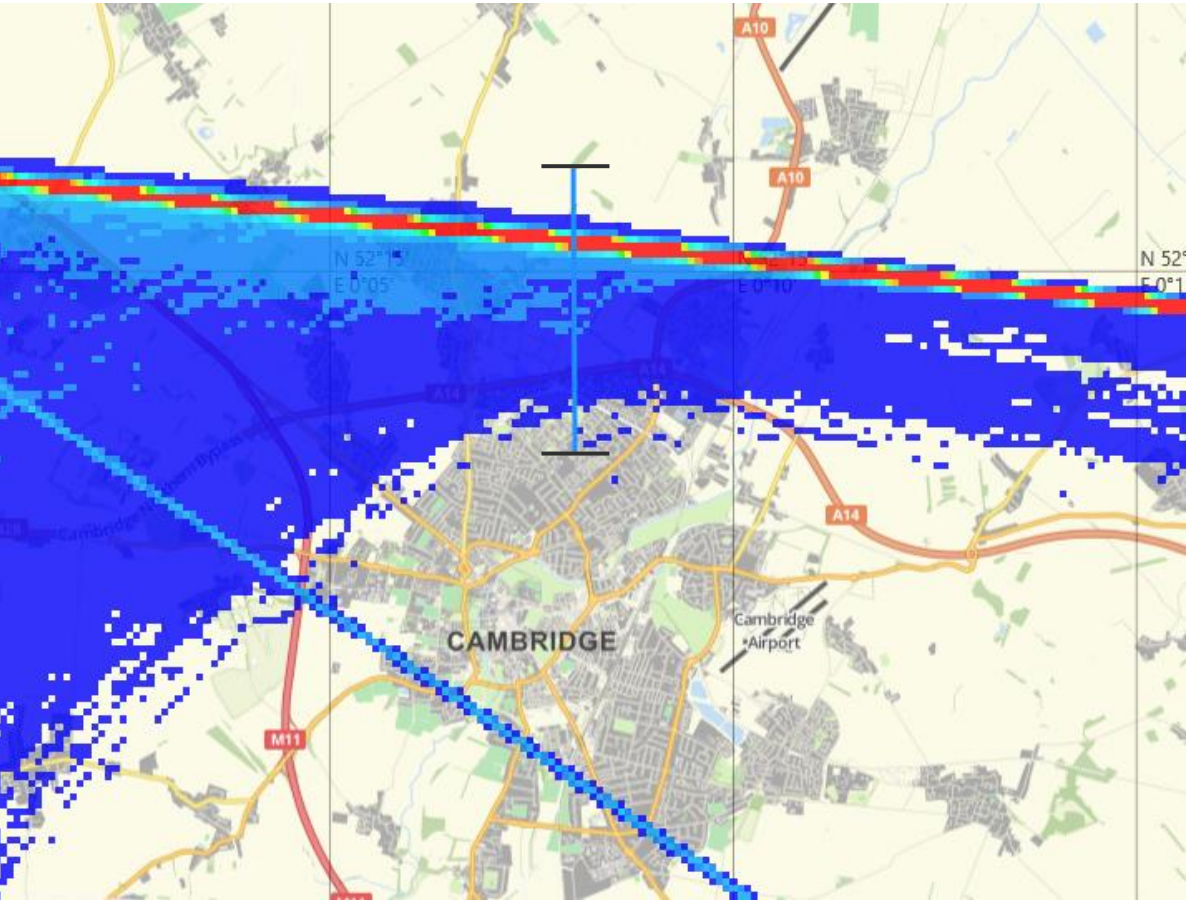
Aircraft Tracks

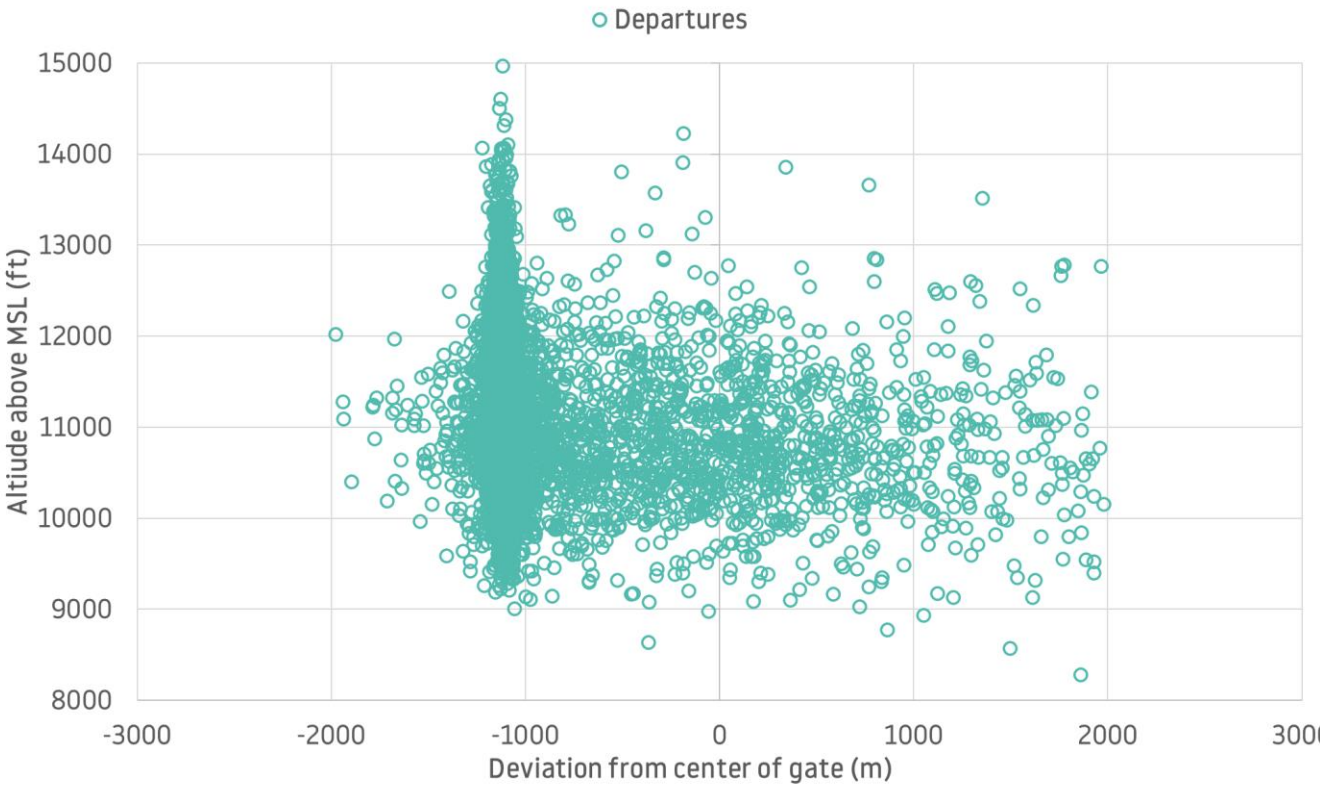
The heat map below show the representative flight tracks that passed near the noise monitor terminals during the monitoring period. The red pinpoint indicates the location of the noise monitor in Impington. This map shows the path of easterly and westerly arrivals.



Altitude Gate Analysis

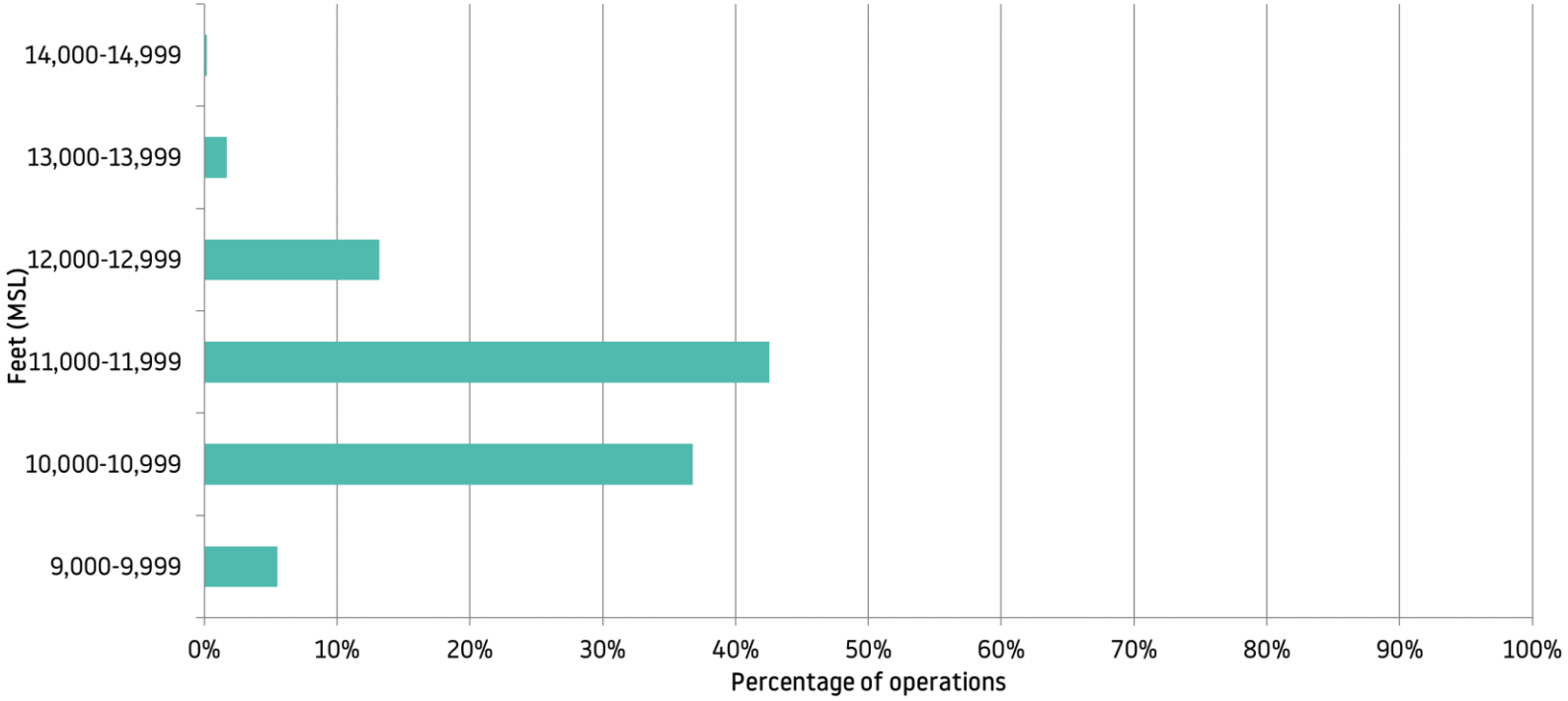
The altitude analysis for Impington, shows the vertical and lateral dispersion of aircraft 2km either side of the noise monitor. The map below shows the 4km gate (blue line) which is drawn perpendicular to the NPR from north to south and it gathered information of every aircraft passing through the gate area. The scatter graph below shows the distance and altitude of aircraft from the noise monitor during the monitoring period. Residents in Impington will see aircraft flying over for arrivals.





Altitude Gate Analysis – Arrivals

The average altitude of aircraft was 11,198 feet AMSL (11,146 feet AGL) when they reach above the noise monitor above Impington. 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	80	11,270
A319	437	11,000
A320 CEO	1,539	11,272
A320 NEO (A20N)	601	11,090
A321 CEO	736	11,333
A321 NEO (A21N)	2,488	11,195
B737-800 NG (B738)	438	11,205
B737 Max 8 (B38M)	294	11,043
Global Express (GLEX)	129	11,111
Cessna 560X (C56X)	89	11,460
All	6,831	11,198

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 Impington, the noise monitoring terminal collected 78 readings. During the period, there were 20,923 easterly and westerly arrivals. Therefore, many of the arrivals were likely to be too quiet for the noise monitor to record, only aircraft over background level were recorded as events.

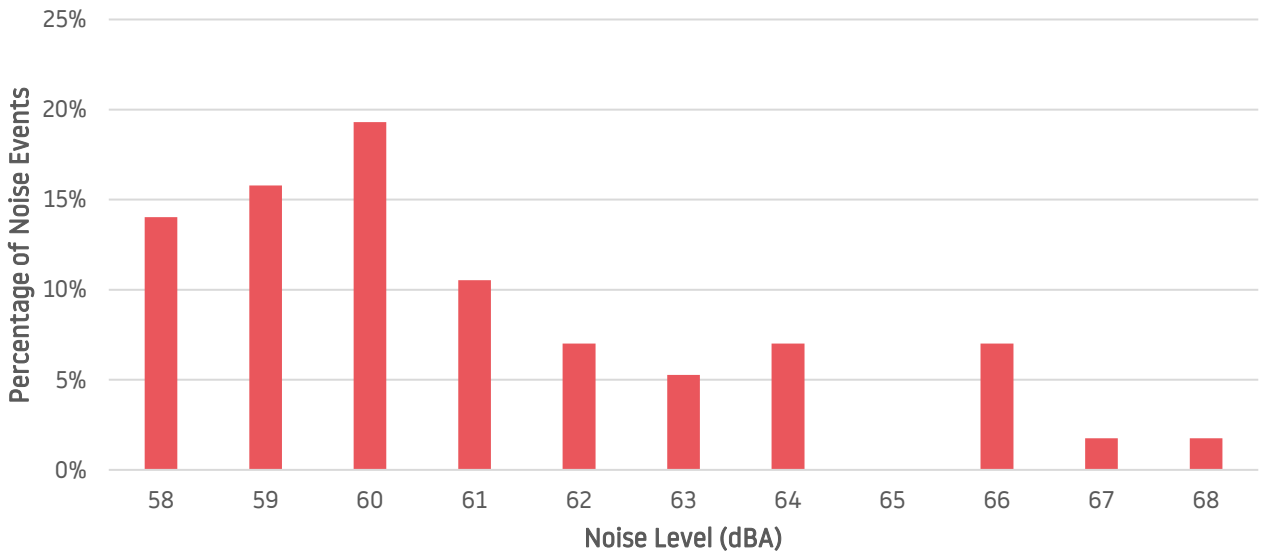
It is noteworthy that the noise monitor may not be able to record every aircraft noise event if the aircraft noise level is below ambient background noise or aircraft following a different route and not through the gate selected. Therefore, there may be a difference between the number of actual air transport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

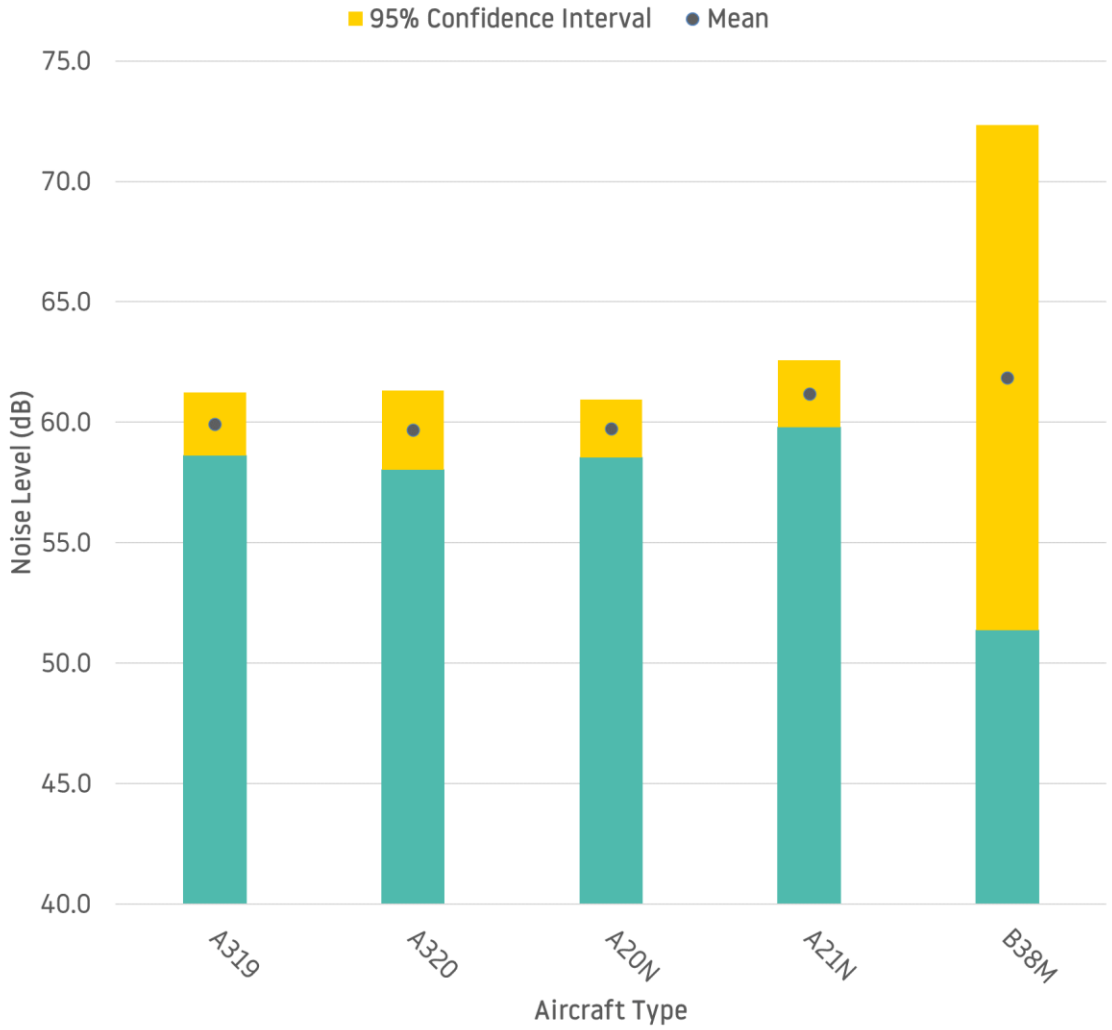
The weather also plays a big part in the data recorded and in periods of extreme weather i.e (very strong winds) the equipment can record noise incorrectly, so we exclude samples from the analysis during these weather conditions. When analysing the samples, the first thing we do is to ensure that there is no unusual noise event present which might not be caused by aircraft (i.e. vehicles or wildlife). A total of 3,959 recordings were excluded from the analysis for the above reasons.

Noise Results – Easterly and Westerly 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	4	60
A320 CEO	4	60
A320 NEO (A20N)	12	60
A321 NEO (A21N)	23	61
B737 Max 8 (B38M)	2	62
All	46	62





*The noise results shown in the analysis are only for those aircraft types that recorded more than 2 events per aircraft. A306 included for comparison.

Noise Results - Summary

- The average arrival noise in Impington was 62.0dB, based on a sample size of 78. Many of the arrivals were likely to be too quiet for the noise monitor to record, only aircraft over background level were recorded as events.

- From the results, Impington's most popular aircraft type by operators, Airbus A321 NEO, had an average noise of 61.0dB. There were no recordings for the A321 CEO in the results. The A320 CEO, had an average noise of 60dB.

- The noise from the newer generation aircraft, A320 NEO, produced the same noise as the A320 CEOs.

- Similarly, the Boeing 737 series, the new B737 Max 8 (B38M), had an average noise of 62.0dB. Around 80% of all noise results movements were newer generation aircraft which are more fuel efficient and quieter.

- During the period from 13th February to 7th June that the noise monitor was in place there were 20,923 arrivals at London Luton airport, it is noteworthy that as seen in the aircraft tracks heat map, not all of those 20,923 arrivals passed over Impington. The noise monitor picked up 4,037 noise results and after analysis 3,959 results were excluded due to results not being caused by aircraft. Only 78 results caused by aircraft were recorded by the noise monitor and were used in the analysis of this report.

Conclusion

- A mobile noise monitor was installed at a residential property on Roselea from the 13th February to 7th June. For Impington, it specifically related to easterly and westerly arrivals. During the monitoring period, the airport operated in the direction of easterly and westerly for 32% and 68% of the time, respectively. Generally, over the year, LLA operate in the westerly direction for 70% of the time due to the prevailing wind.
- Aircraft travelled at an average of 11,198 feet over Impington, with no aircraft below 8,000 feet.
- 80% of the noise events recorded in Impington were created by the newer generation aircraft, A320 NEO, A321 NEO and B737 Max 8. The A320 NEO registered average departing noise of 60.0dB, the same dB as the A320 CEOs.
- 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.