Community Noise Report

Stevenage - Westerly

Aug – Oct 2019

London
Luton
Airport

Introduction

As part of the ongoing noise monitoring programme, London Luton Airport (LLA) deployed a portable noise monitoring terminal in Stevenage.

The purpose of the monitoring programme is to understand the typical noise levels created in the local community. For Stevenage, it specifically related to the westerly arrivals when aircraft line-up for the runway during the final approach phrase.

The noise monitor was located in Stevenage between 10th August and 4th October 2019.

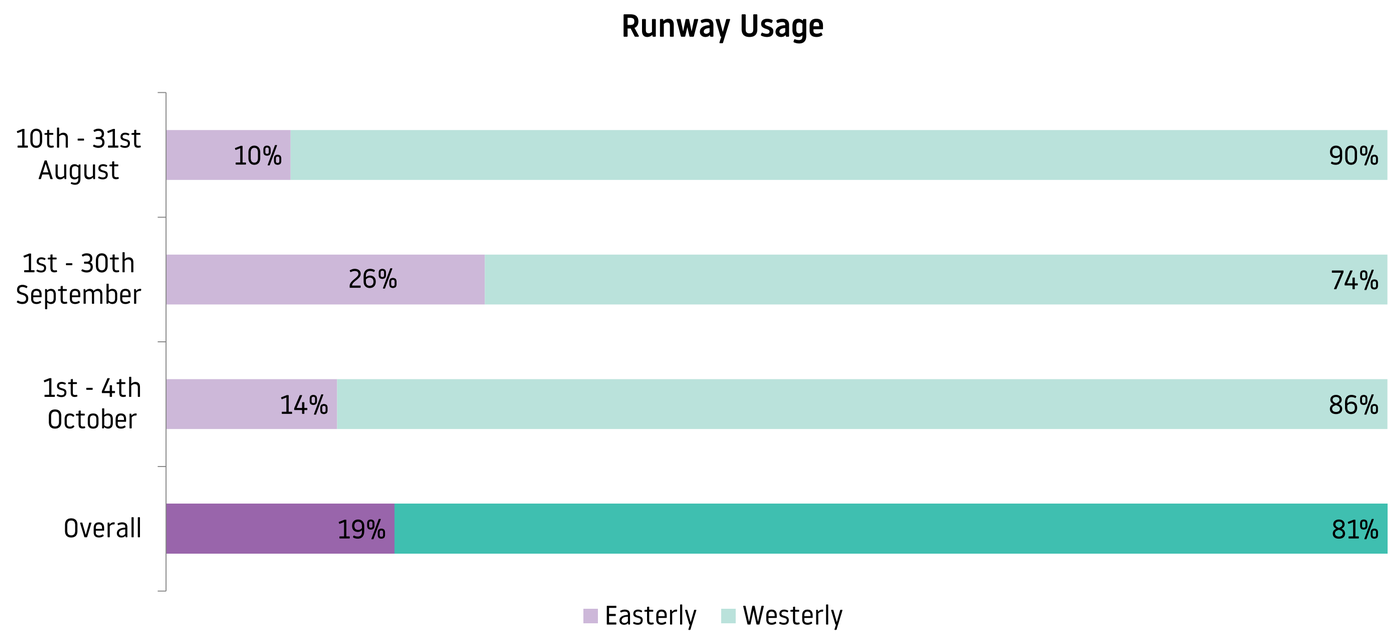
The monitor's location was within the main westerly arrival corridor approximately 297m south of the route's centreline at an altitude of 348 feet above sea level. The red pinpoint on the map shows the location of the noise monitor.

The aircrafts' noise and tracks were recorded and 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

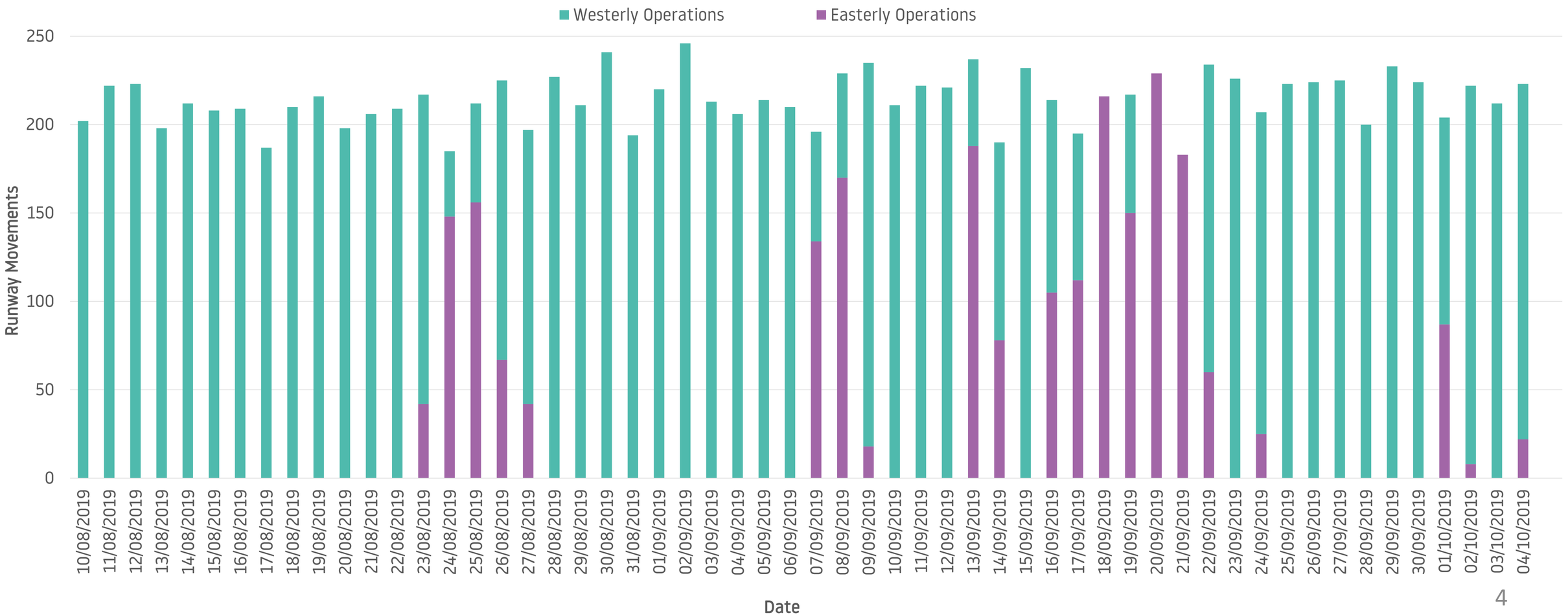
At the airport we have two directions of operation, depending on the wind direction, as aircraft are required to take off and land into the wind for safety reasons. These are known as easterly operations and westerly operations and can change the aircraft tracks nearby specific areas. The split in operating direction varies from year to year and month to month. The amount of time that the runway operates in one direction all depends on the weather.

During the noise monitoring period, the direction of LLA's operation was 19% easterly and 81% westerly. The five year average for this time of the year is 27% easterly vs 73% westerly which demonstrates that residents in the area would have experienced increased movements during the monitoring period. 9,762 aircraft landed on the westerly runway whilst the monitor was located in Stevenage. The chart below shows the runway usage split for each month during the noise monitoring period.



Daily Movements During Monitoring Period

The bar chart below shows the number of daily arrivals that passed the noise monitor. Due to the location of Stevenage, most flights that landed on runway 26 whilst on westerly operations would have flown passed the monitor.
During the monitoring period, there were 3 days of easterly operations and therefore no arrival flights passed near the monitor on these days.



Operations during the monitoring period

The graph below represents the average number of arrivals during the monitoring period. During the peak periods, local residents of Stevenage may notice more aircraft. Peak periods were at 07:00-08:00, 12:00-14:00 and 17:00-20:00.

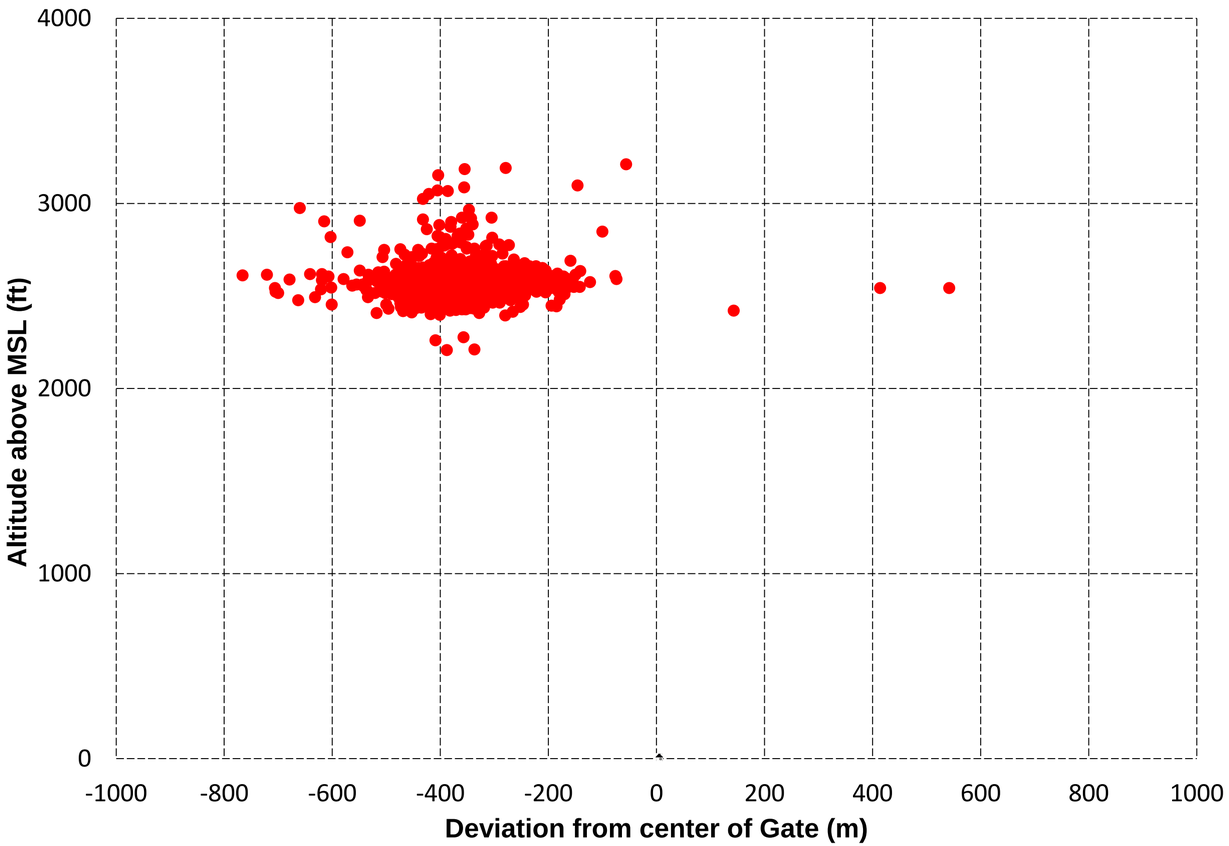
During the night period of 23:00 – 06:00, there was an average of 30 arrivals compared to 29 arrivals for the previous year, showing a small increase in night time operations at London Luton Airport.

Aircraft Tracks During the Monitoring Period

The heat map below shows the representative flight tracks that passed near the noise monitor terminal during the monitoring period. The red pinpoint indicates the location of the noise monitor, 297m south of the runway 26 final approach centreline at an altitude of 348 feet above sea level..

Altitude Analysis During Monitoring Period

Altitude analysis shows the vertical and lateral dispersion of aircraft 1.0km either side of the noise monitor. The scatter graph below shows the distance and altitude of aircraft from the noise monitor during the monitoring period. The bar chart shows that 80% of flights were between 2,500-2,999 feet above sea level (ASL) with 19.9 % of flights between 2,000-2,499 feet ASL. The average altitude of aircraft in this area was 2,532 feet ASL (2,184 feet above ground level).



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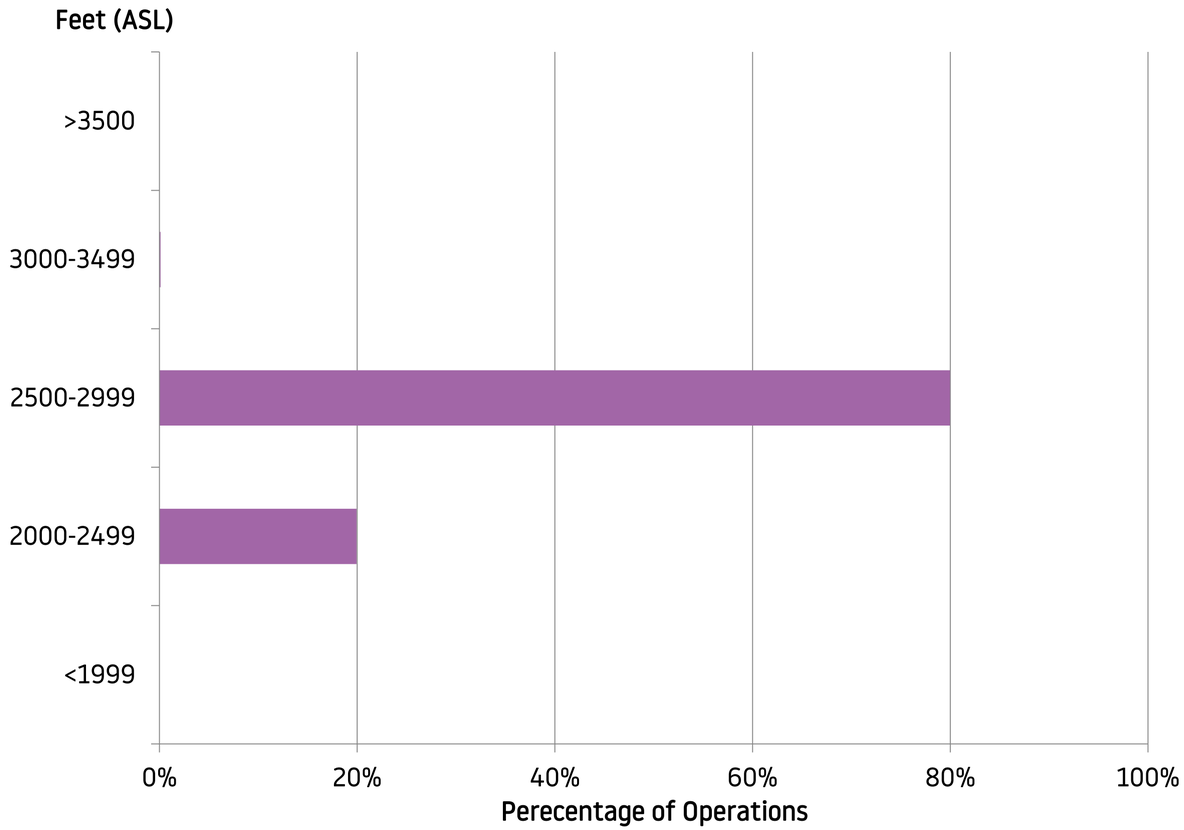


How Do We Analyse The Noise Data

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 in Stevenage, the noise monitoring terminal collected readings from 5,155 aircraft which is fewer than expected but adequate enough for in-depth analysis. There was an internal power outage to the noise monitor in the last 13 days of the planned monitoring period. This had caused 2,655 potential noise events not being captured during the outage. In addition, there were 4 days of unreliable recordings due to network issue, these has been excluded from the analysis. There were approximately further 1,100 events not captured by the noise monitor due to the noise level below threshold setting or near background noise level.

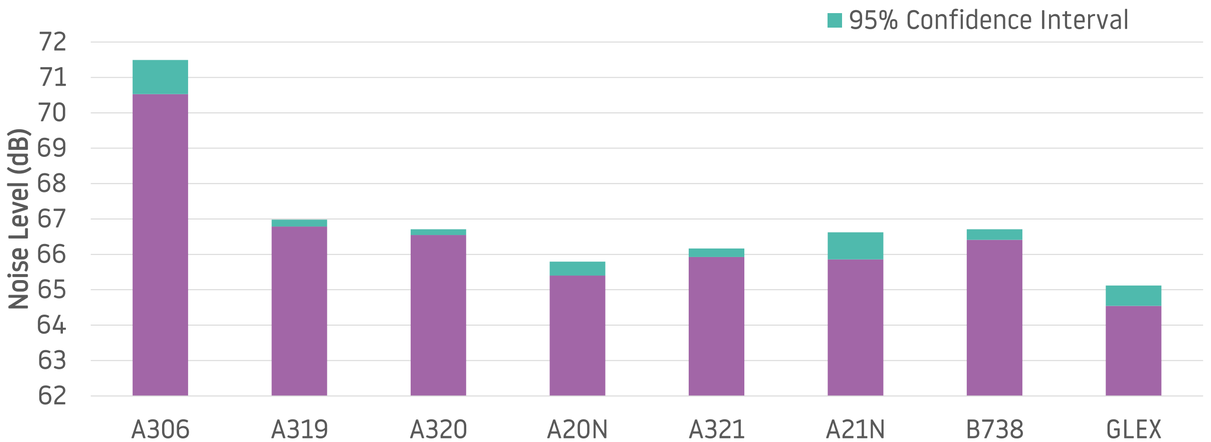
In this analysis, two samples were excluded from the analysis for weather reason as outlined above, which left 5,153 noise reading samples to analyse.

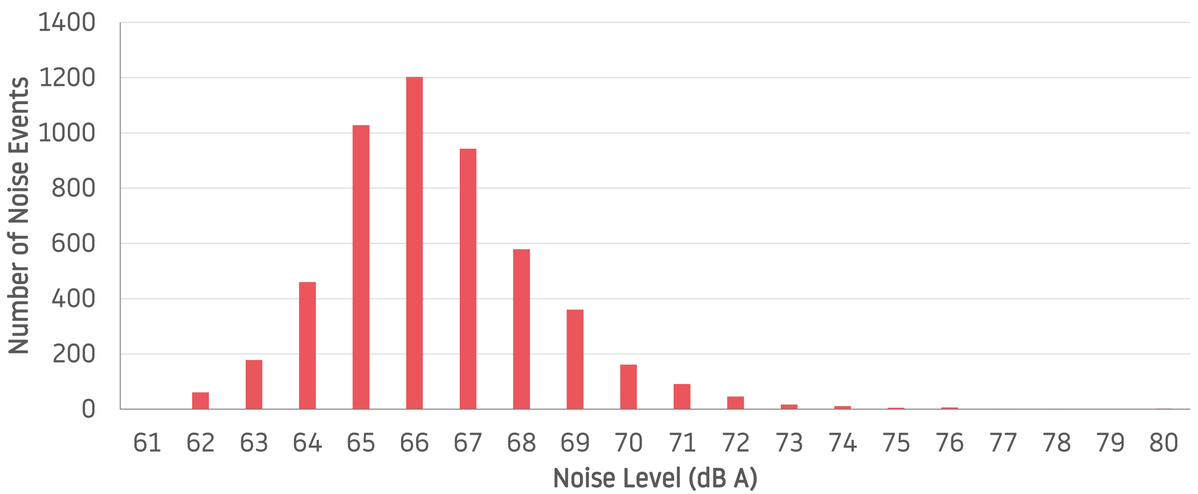
Noise Results During Monitoring Period

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	53	71.0
A319	890	66.9
A320	1,732	66.6
A20N (A320 Neo)	171	65.6
A321	800	66.0
A21N (A321 Neo)	84	66.2
B738	688	66.6
GLEX (Global Express)	123	64.8

The average noise in Stevenage is 66.4 dB, based on a sample size of 5,153. The table above 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, the newer generation Airbus A320, A320 NEO, produced slightly less noise than the A320 CEO on arrivals. For the A321, although our other noise study found that the A321 NEO aircraft created significantly less noise than the A321 CEO on departures but this Stevenage noise study found that the A321 NEO sometimes produce more noise than the A321 CEO on arrivals, as shown by the green bar. That is due to the higher landing weight of the aircraft which means higher flap angle is needed to maintain a safe approach speed. That in turn increase the aerodynamic noise. Nevertheless, the average arrival noise of A321 NEO was slightly higher than the A321 CEO. From our Q2 2019 Quarterly Report, the A321 NEO accounted for 1% of all air transport movements. The A306 cargo aircraft was the noisiest aircraft type at Stevenage during the monitoring period. LLA will continue to monitor this closely.





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

Conclusion

- During the noise monitoring period, the airport was using westerly operations for 81% of the time, this is more than the five year average of this time period, and therefore residents would have experienced more frequent noise during this period than in recent years.

- The average altitude of aircraft in the area is 2,532 feet above sea level, and as Stevenage is already 348 feet above sea level, aircraft will typically be 2,184 feet above ground level in this area.

- Above Stevenage, aircraft are typically between 2,500-2,999 feet during the monitoring period. That accounted for 80% of all aircraft.

- The main aircraft types operating at the airport are A320 & A319 which produced an average noise of 66.6dB and 66.9dB respectively.

- 4.9% of the noise events recorded were created by newer generation aircraft, A320 NEO and A321 NEO, registering average noise events of 65.8 dB.

- The newer A320 NEO aircraft was slightly quieter than the A320 CEO aircraft on arrivals in Stevenage. On the other hand, this Stevenage noise study shows that the arrivals of A321 NEO aircraft sometimes create more noise than the A321 CEO aircraft, due to the higher landing weight of the aircraft which means higher flap angle is needed to maintain a safe approach speed. That in turn increase the aerodynamic noise. Nevertheless, the average arrival noise of A321 NEO aircraft was slightly higher than the A321 CEO aircraft at Stevenage. At London Luton Airport, this aircraft type accounted for 1% of all air transport movements in Q2 2019.

- London Luton Airport will continue to monitor noise levels and other initiative (delayed landing gear deployment) that may reduce aircraft noise at Stevenage.

- 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 arrival route from the direction of Stevenage.

SID: Standard instrument departure, is the published route that an aircraft must follow on departure.

Aircraft Movement: A single aircraft departing or arriving at the airport.

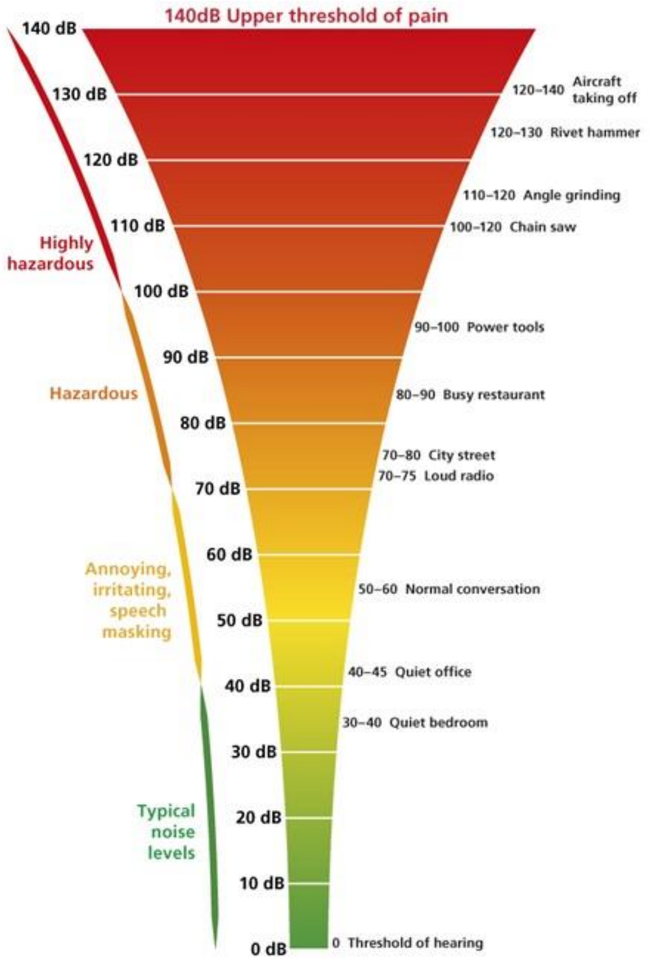
Gate Analysis: A 1km - 3km gate which is drawn across an area and will gather information about every aircraft passing through the gate area.

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