Note to address noise related points raised by third parties in week 1 of inquiry

28th October 2022

Introduction

This note has been prepared by LLAOL to respond to some noise-related matters which were raised by third parties during week one of the Inquiry. This includes:

- A321NEO Noise
- MATCH departure route – airspace change
- Noise Insulation Scheme – ground noise
- Future Airspace Strategy Implementation-South (FASI-S)
- Trials and studies
- Go-arounds
- South Luton – westerly first turn
- Noise Preferential Routes (NPR's)
- 24hr Operations
- Noise from aircraft in Harpenden

A321NEO Noise

A few of the third party speakers stated that the A321NEO is louder than the A321CEO. This is incorrect. The aircraft is quieter on departure at LLAOL's three fixed noise monitors 6.5km from the start of roll (which is an ICAO recommendation noise certification point), although they are not as quiet as the certification levels predicted. BAP, as the independent noise consultant to the London Luton Airport Consultative Committee (LLACC), produced a report for LLACC (publicly available) on this topic which showed the mean operational noise levels for the A321NEO/A321CEO, this report is attached at Appendix 1. It sets out that in both 2019 and 2020 the results showed an improvement on departure. The arrival noise is very similar for both A321NEO and A321CEO but this is consistent with the certification.

Aircraft Operation	Noise Monitoring Terminal	Average SEL Noise Level, dB(A)	Sample Size
LANDING			
Airbus A321ceo	NMT1	84.6	9,216
Airbus A321neo	NMT1	84.6	1,042
DEPARTURE			
Airbus A321ceo	NMT1	85.4	3,299
Airbus A321neo	NMT1	83.6	393
Airbus A321ceo	NMT2	85.2	9,559
Airbus A321neo	NMT2	83.4	974
Airbus A321ceo	NMT3	85.7	6,710
Airbus A321neo	NMT3	83.9	670

Separately, one third party stated that the A321NEO was not as quiet as the A320CEO. The results from these aircraft types are very similar. However, as the A321NEO has a seat capacity of 239 compared to the A320CEO at 186 the noise impact per passenger is less on the A321NEO.

However, it is correct that the A321NEO is not as quiet as the A320NEO, which is expected as the A321 is larger. The aircraft also have different engines. LLAOL publish noise data from the fixed noise monitors in our quarterly monitoring reports (page 17 in Q2 2022 report, section 4.3), and this shows that the A320NEO is quieter.

The contours presented in the environmental statement ('ES') for this application used actual noise monitoring results for the A321NEO as opposed to the certification levels. As such, the difference between the A321NEO and A320CEO has been taken into account. LLAOL continue to work with Airbus, the operator and other airports who are experiencing similar results to improve the noise performance from the A321NEO.

MATCH departure route – airspace change

Some third parties referred to an airspace change made by LLAOL. In 2015 LLAOL implemented a change to the main westerly departure route (now known as Match, previously known as Brookman's Park). On average 50% of westerly departure traffic uses this route with aircraft destinations in northern and eastern Europe.

This route was changed to use more precise satellite navigational technology called aRea NAVigation (RNAV) as opposed to the conventional procedures which creates dispersion of aircraft across a larger area. The governments Airspace Modernisation Strategy[1] encourages change sponsors to make the most of the capabilities of modern aircraft and satellite-based navigation technology. The Department for Transport has also released strategic rationale[2] for upgrading the UK airspace and states that "Airports' standard arrival and departure routes need to be upgraded using satellite navigation to add capacity and introduce the flexibility to better manage noise impacts."

RNAV typically concentrates aircraft along a route allowing aircraft to route between communities on a more precise line. The technology can reduce the population overflown, but those which are overflown will be overflown by each departure on that route. The modelling[3] showed that this airspace change reduced the population overflown by 10,000 people (from 13,000 to 3,000). The maps on the following page shows the old route compared to the new route.

[1] CAP 1711 - Airspace Modernisation Strategy
[2] Upgrading UK Airspace Strategic Rationale
[3] Airspace Change Documentation

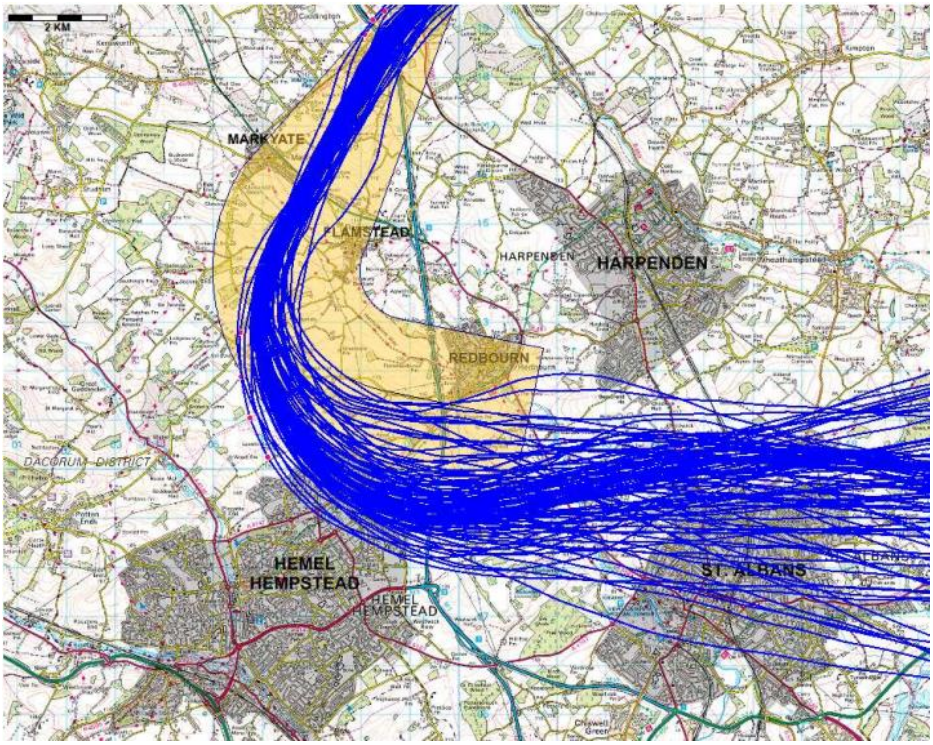


Figure 1: The MATCH departure route before the airspace change.

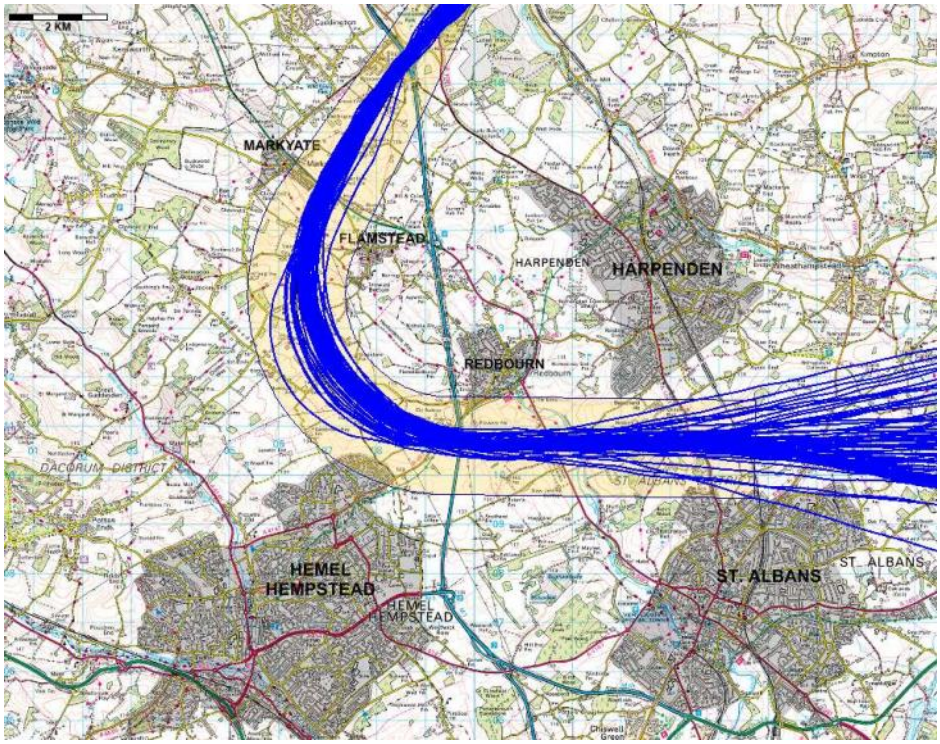


Figure 2: The MATCH departure route after the airspace change.

The route prior to August 2015 dispersed aircraft over Harpenden and St Albans, so these areas were previously overflown but an individual may not have heard every flight as there was a distance between them. The airspace change followed the CAA's CAP 725 regulatory process, this process has since been replaced by CAP 1616 which is a longer process.

LLAOL conducted a full public consultation and flight trial in line with CAP 725 which showed that over 90% of the 1,400 respondents were in favour of the changes.

The old conventional route is still in place, but over 99% of aircraft operators use the RNAV route as this is a preference. As part of the change LLAOL also raised the permitted vectoring altitude to 4,000ft, this means aircraft are not permitted to leave the Noise Preferential Route (NPR) until they have reached an altitude of 4,000ft during both daytime and night time - if an aircraft were to do this they would incur a penalty fine pursuant to the Track Violation Penalty Scheme (secured by the S106). However, there may be times when it is operationally unsafe to remain within the NPR corridor (e.g. to avoid bad weather) and in these instances Air Traffic Control (ATC) are permitted to vector the aircraft off of the standard route. Aircraft can also be vectored before the railway line between Harpenden and St Albans by ATC when there is another aircraft in the airspace (such as a Heathrow or Northolt departure), this to maintain safety but can cause overflight of south Harpenden and North St Albans.

LLA collected data for the CAA and provided this on the 30th October 2017, the CAA completed the review and published a report[4] in March 2020 which confirmed that no modifications were needed to the design.

Noise Insulation Scheme – ground noise

In one of the statements made by a third party on Tuesday 27th September, a comment was made that the current LLA Noise Insulation Scheme does not take account of ground noise. This is incorrect. The ground noise criteria is shown below. This is part of LLAOL's Noise Management Plan (latest draft, CD18.02) and is summarized in the Aircraft Noise Control Scheme (CD8.45, last page).

Ground Noise Daytime Criteria
"Any habitable rooms at dwellings which are exposed to a free field noise level in excess of 55 dB LAeq,16h daytime (07.00-23.00) based on actual aircraft operations at the Airport for the summer period (16th June to 15th September) in the immediately preceding calendar year. This will be determined on an annual basis."

The Noise Insulation Sub-committee selects properties to be contacted for insulation each year, which are chosen from the eligible properties. So far the committee have not selected any properties which are eligible due to ground noise. Ground noise can be considered similar to non-residential in respect to the scheme; the current scheme covers these property types but they have not been selected by the committee yet.

FASI-S airspace change

A number of interested parties have referred to future airspace changes. London's Airspace is a particularly busy area and is in need of modernisation. The current airspace was designed in the 1960's for fewer aircraft and it has not been re-designed since, despite the increase in flights from all airports and advances in aircraft technological capabilities. It is based upon a network of ground based radio beacons, with aircraft routes flying to or from a heading on a beacon.

As part of a National airspace change programme, as detailed in the Civil Aviation Authority's (CAA) Airspace Modernisation Strategy (CD10.11), London Luton Airport is required to update

[4] CAP 1882 – Post Implementation Review

all of its arrival and departure procedures in a move towards satellite based technology. In 2021 the government passed the Air Traffic Management and Unmanned Aircraft Act [5]which means the government can now force an airport to conduct an airspace change if it will have a national benefit, it is thought within industry that this will ensure FASI-S is successful as previously airports have dropped out, if one airport stops the entire programme will stop, this Act reduces the risk of that occurring.

The government also funded Stage 2 for airports as the airspace change proposals were paused at all airports due to COVID. LLA paused from April 2020 to May 2021, after May 2021 LLAOL accepted government funding until March 2022. This shows how important it is for the government to continue with airspace modernisation, as previous attempts at redesigning the London airspace have failed in the past due to funding (the previous program was called LAMP – London Airspace Modernisation Programme).

The CAA have published a formal process called CAP1616[6], this process must be followed by LLA when making an airspace change CAP1616 sets out a number of detailed steps that must be followed, with the CAA approval[7] required at the end of each stage in order to progress.

In LLAOL's original statement of need (Stage 1 of CAP 1616) it said 'LLA would use this as an opportunity to look at options of aircraft reaching higher altitudes sooner on departure and remaining higher for longer on arrival enabling significant environmental benefits'.

Timeline for the FASI-S Airspace Change

LLAOL started this process in December 2018, and is now in Stage 3a (Consultation). Luton was the first London airport to pass the Stage 2 gateway in March 2022. LLAOL now needs to wait for other airports to reach this stage to compare designs and calculate the cumulative impacts. The airports which Luton is dependent upon are Stansted, London City, RAF Northolt and London Heathrow. LLA is currently waiting for Heathrow and Northolt to reach Stage 3. London City and Stansted are already in Stage 3 having passed earlier this year.

ACOG Masterplan

ACOG (Airspace Change Organising Group) are producing iteration 3 of the masterplan which is due to be published early 2023, this will include a more detailed timeline. Currently LLAOL expect deployment around 2028. In ACOG's 2nd Iteration of the masterplan[8] this showed Luton as deploying between 2027 and 2030, due to the link with Heathrow (page 66, bullet point 3).

CAMWG

LLAOL have set up a Community Airspace Modernisation Working Group (CAMWG) which is formed of individuals from local communities with knowledge and experience of airspace changes and noise impacts. CAMWG provide additional insights during the design of airspace change proposals, including consultation material. There is still extensive engagement with the wider community as part of the CAA's CAP1616 Airspace Change Guidance through community focus groups, well as with Luton's airlines and general aviation stakeholders.

Trials and Studies

As part of LLAOL's ongoing commitment to minimise the impact of noise LLAOL have conducted two trials this year. The first one was a full length runway trial which was during Feb-March

[5] Air Traffic Management and Unmanned Aircraft Act 2021
[6] CAP 1616 – Airspace Change Guidance
[7] Airspace Change Portal – Luton FASI-S
[8] ACOG Masterplan – Iteration 2

2022. The second trial was an NADP trial which has only recently concluded and ran from August-Sept 2022.

NADP Trial

The NADP trial was originally scheduled for 2021, but was delayed until 2022 due to maintenance being carried out on noise monitors. This was a commitment as part of LLAOL's Noise Action Plan 2019-2023. Luton also had more movements in 2022 which could therefore participate and more data collected.

LLAOL shared a brief[9] with LLACC and NTSC and asked for comments. One of these can be seen in CD8.44. The committee asked for Wizz to be involved and LLAOL did ask Wizz to be involved. The committee also suggested to add additional noise monitor locations which LLAOL did. LLAOL have not published any results of this trial as it are still analysing the results. LLAOL will publish a report after the analysis.

Full length runway trial

In February 2022, LLA asked all operators to use the full length of the runway for departure, rather than from the intersection point (purple arrows). It was expected that longer runway length would require less thrust on take-off roll and the position of the aircraft would be higher by the runway threshold and therefore will produce less noise. LLAOL collected data for 6 weeks, and presented the preliminary results to NTSC in June (slides attached at Appendix 2). At the time the traffic numbers were reduced due to COVID before the return of traffic in the summer period.

The results did not show a consistent reduction at each noise monitor and runway direction, so it was agreed that further work was required to analyse the results. LLAOL are still doing this and will be looking to issue a report later in the year or early 2023. LLAOL have not progressed the trial further and would not be looking to implement this at LLA at this time.

Delayed landing gear trial

In 2017 LLA conducted an aviation leading trial to reduce noise by from arriving aircraft. The trial, conducted during the summer, consisted of aircraft delaying the deployment of landing gear. As an aircraft makes its final approach most noise is caused by the flow of air over the fuselage as drag is created to slow the aircraft down. Noise was measured along the arrivals flightpath to understand what, if any, reduction which could be achieved. Stevenage, Dagnall and Whipsnade were among those communities who saw the greatest benefit of between 2.7db and 3.4db Following the successful trial, some operators changed their operating procedures to make this standard practice. We continue to remind our operators of this procedure, and we

[9] LLAOL's NADP Project Plan

estimate approx. 70% of operators now adopt this procedure. This was mentioned in the 2017 Annual Monitoring Report on page 22 (CD8.24).The full report[10] is available on LLAOL's website.

Steeper Approaches Study

Most arrivals use the international standard Instrument Landing System (ILS) 3.0° glide path at final approach. As part of our Responsible Business Strategy (2020-2025), LLAOL committed to assess if a Slightly Steeper Approach can be adopted and implement recommendations by 2023. This study was completed in 2021 and a report[11] published in 2022.

The feedback from operators and NATS was collated and evaluated. From the feedback, and the increased risk to safety specific to LLA, it was not recommended to implement Slightly Steeper Approach's of 3.2° at LLA. However, LLAOL committed to continue to review with operators and NATS should it be possible to implement in the future.

Go-arounds

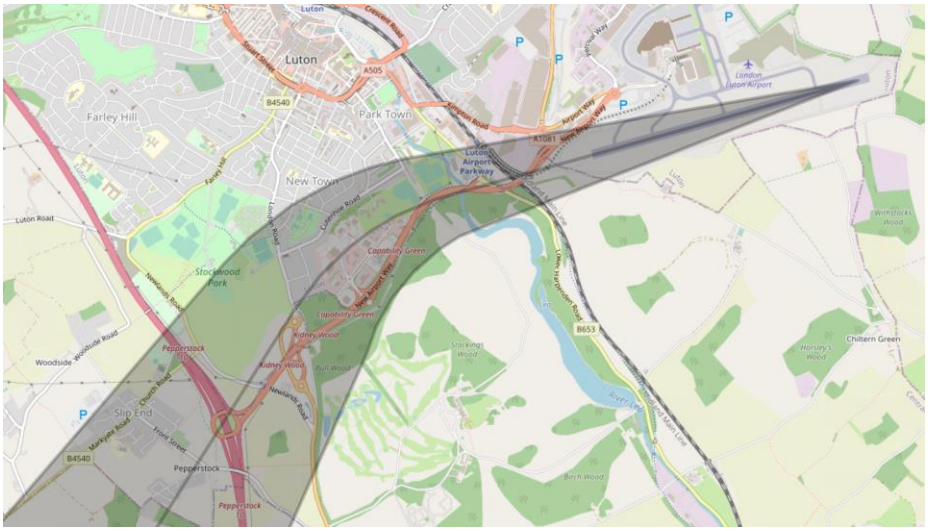
In statements from interested parties on Wednesday 28th September there were concerns around go-arounds. There are times at LLA when an arriving aircraft conducts a go-around, this is when the aircraft makes an additional lap before landing at the airport. This is common practice and occurs to approx. 0.7% of Luton arrivals, which is in line with other airports. LLA does not have more go-arounds when compared to other airports.

Go-arounds are a safety procedure and can be instructed from the pilot or Air Traffic Control. They can occur for a variety of reasons, such as debris or a vehicle on the runway or for a passenger who does not have their seat belt on. Weather can also cause go-arounds for example an unstable approach. Go-arounds typically cannot be predicted and therefore the aircraft is instructed to remain low, below any other aircraft which may be in the airspace above, and they also do not follow the normal flight paths to keep them separated.

South Luton – westerly first turn

On Wednesday 28th September, two interested parties raised a concern that private aircraft fly differently to commercial aircraft in the first turn of the NPR in westerly operations. The map below shows this turn and the NPR corridor, this is taken from our noise and track monitoring system.

[10] Delayed landing gear trial report
[11] Slightly Steeper Approach study



When an aircraft departs at Luton during westerly operations the aircraft must make the first turn upon reaching 1,030ft Above Mean Sea Level (AMSL). The timing of when an aircraft gets to this point is different based on the aircraft type, weather and the load factor of the aircraft. Private aircraft are typically lighter and climb quicker, reaching 1,030ft earlier than other operators, this can cause the aircraft to make the turn earlier and would therefore make a tighter turn on the corridor. Heavier aircraft such as cargo will typically make a later turn (although still within the corridor) which takes a wider turn.

It is correct that private aircraft typically receive the most track violation fines (this is shown in annual monitoring reports), and are least familiar with departing from Luton as they may only fly in/out of Luton a couple of times a year. Although, a tight turn this close to take off is unusual for an airspace design, and is due to the proximity to the Dunstable Gliding Club airspace to the west of Luton, this is not something LLAOL are looking to change as part of FASI-S.

Noise Preferential Routes (NPR's)

In a statement by an interested party on Wednesday 28th September it was stated that there are no easterly NPR's (Noise Preferential Routes) for easterly operations. This is incorrect. There are NPR's for each of our departure routes. The Annual Monitoring Report 2019 (CD8.26) on pages 18 and 19 show the NPR's. The routes have a centreline inside the NPR, and LLAOL encourage operators to stay within these.

The Lateral Swathes (LS) are defined from the centre-line of the relevant NPR by a line either side, each diverging at an angle of 10 degrees from a point on the centre-line of the runway 2km from the start of roll; followed by a pair of parallel lines representing a distance of either 1.5km or 1km (for RNAV) either side of the route centre-line. The NPRs and consequently the lateral swathe include curved sections representing turns, this is detailed in LLA's departures briefing[12].

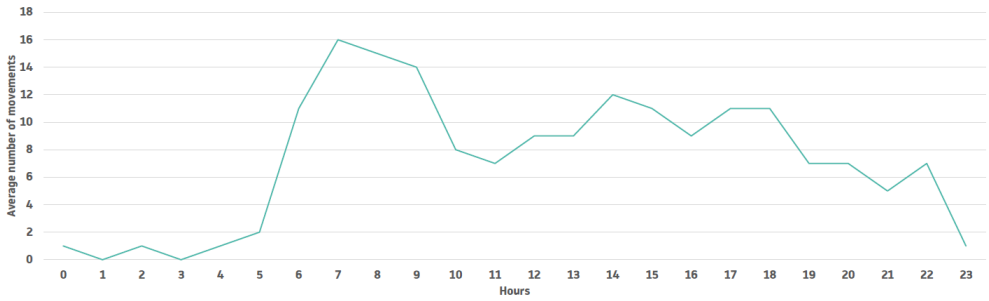
The obligations of Noise Preferential Routings for conventional Standard Instrument Departures (SIDs) (all except westerly Match departure route) cease when a height of 3,000ft (between 07:00hrs to 23:00hrs local time) and 4,000ft (during night time, 23:00hrs to 07:00hrs local time) has been reached. The obligations of the RNAV NPR (westerly Match route) ceases when a height of 4,000ft has been reached at all times. Once aircraft have reached the NPR restricted altitude they will be considered no longer on the Noise Preferential Route. At that

[12] LLAOL's departures briefing document

stage the aircraft may be directed by Air Traffic Controllers onto a different heading in order to integrate with the overall flow of traffic. This is standard air traffic management procedure followed by all airports in this country and other member states of ICAO. This particularly applies to Wheathampstead overflown from the easterly Compton departure route.

24hr Operations

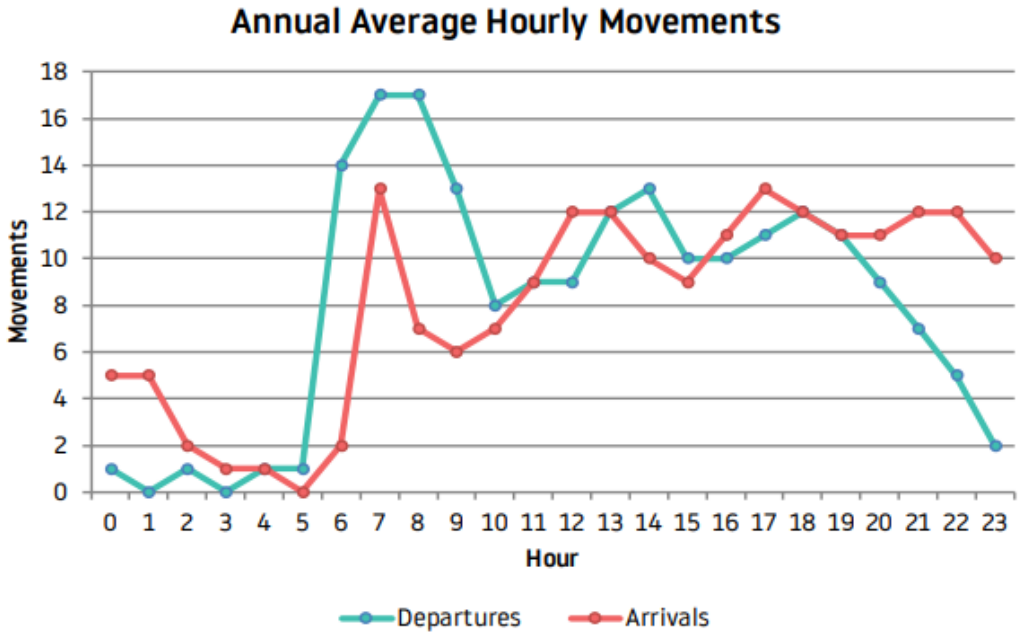
In a statement made by an interested party on Tuesday 27th September there was a comment made that in Harpenden a Luton aircraft will overfly every 2 minutes, 24hrs a day. This is not correct. LLAOL's Community Noise Report for Harpenden is at Appendix 3. Page 5 of this document contains a graph below which shows the average 2019 operations over the monitoring period.



For Harpenden in general, the morning peak starts at 07:00 and may last up to 3 hours. The afternoon peak is generally between 1400-1500 and 1700-1900. On a day of westerly operations which occur approximately 70% of the time annually, residents may notice more aircraft flying close to South Harpenden. On a day of easterly operations, residents may notice less aircraft as only 35% of flights (2019's average) use the Compton departure route and it is further north from South Harpenden.

LLAOL also create similar graphs in its Annual Monitoring Report. The graph below is from the Annual Monitoring report 2019 (CD8.29 – page 6) which shows the average annual hourly movements.

The busiest time on average during 2019 for departing aircraft was 07:00-08:00hrs, with another peak between 13:00-14:00. The average busiest time for arrivals was 07:00-08:00hrs and 17:00-18:00 hrs. The graph also highlights a low level of average movements during the hours of 00:00-06:00 hrs.

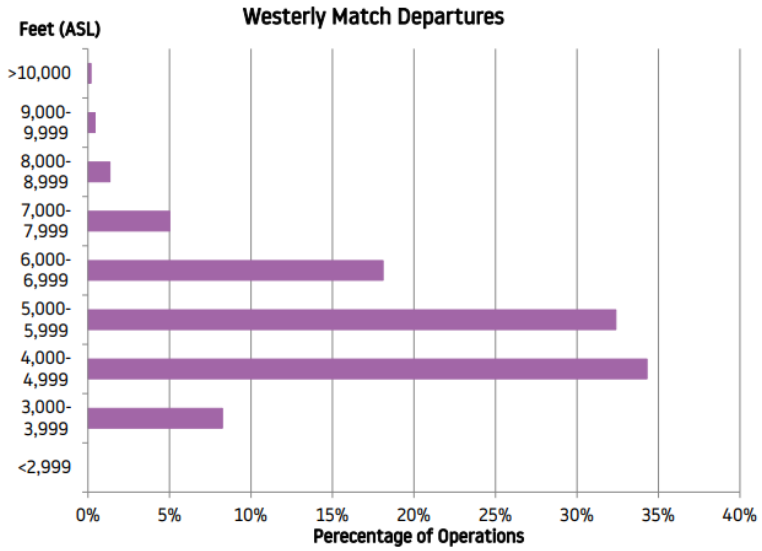


Noise from Aircraft in Harpenden

LLAOL conduct regular monitoring using portable noise monitors. In 2019 noise in South Harpenden was monitored and the Community Noise Report can be seen in Appendix 3. Aircraft using the westerly Match departure route were monitored as part of this. Unfortunately arriving aircraft overflying Harpenden were not picked up by the noise monitor during the monitoring period as these events did not meet the noise monitor thresholds above the ambient background levels.

The table and graph below were taken from the Community Noise Report. The table shows the average noise from the most common aircraft types on this route. The graph below shows the altitude of aircraft on this route when passing the railway line between Harpenden and St Albans.

Aircraft Type	Number of movements	Average Noise (dB)
A306	55	64.0
A319	144	62.3
A320 CEO	756	62.9
A20N (A320 NEO)	26	59.9
A321 CEO	851	63.6
A21N (A321 NEO)	76	63.3
B738	213	63.1



Flight Tracks over Harpenden

In Mr Pentland's statement (INQ-35), there have been flight tracks provided from FlightRadar24. LLAOL operates and maintains an Airport Noise and Track monitoring system. This system uses Air Traffic Control radar data which plots the route of an aircraft laterally and vertically.

Air Traffic Control radar data is more accurate than Flight Radar24 due to the regular calibrations radar must have to ensure safety of all aircraft in the airspace. FlightRadar24 uses the public ADS-B (Automatic Dependent Surveillance–Broadcast) data from private individuals and therefore has little or no control over the quality or the calibration of the equipment. FlightRadar24 also encourages individuals to build their own ADS-B receivers [13]with information on their website. FlightRadar24 recognises that the system is not always accurate and has an article showing the typical issues with tracking flights [14]using their system. LLAOL discourages the use of FlightRadar24 due to these inaccuracies and instead operates a public version of the Airports Noise and Track Monitoring system (using radar data), this is known as TraVis[15].

In Appendix 4 LLAOL has provided screenshots from the Airports Noise and Track Monitoring System showing the same aircraft mentioned in Mr. Pentlands submission. These maps use Air Traffic Control radar data which is received every 6 seconds; this is shown in each of the maps by white dots on the tracks, the data shown on each map in the shaded box is from the yellow radar point on the track, this shows the exact time and altitude of the aircraft at this point.

Harpenden is an area of controlled airspace within the London Terminal Manoeuvring Area (LTMA) and therefore can be overflown by aircraft from other airports, not just Luton. However, these flights will be instructed by NATS En Route Ltd and therefore are outside of the control of LLAOL.

[13] FlightRadar24 – build your own ADSB receiver
[14] FlightRadar24 – Common errors on FlightRadar24
[15] LLAOL's TraVis

Appendix 1

Mean Operational Noise Levels: Airbus A321ceo/neo

Bickerdike Allen Partners
Architecture
Acoustics
Technology

Project: London Luton Airport Consultative Committee

File Ref: A11060.03 N07

Date: September 2021

Subject: **Mean Operational Noise Levels: Airbus A321ceo/neo**

From: Jeff Charles, Bickerdike Allen Partners LLP

Further to the consideration of the formal noise certification test results, Bickerdike Allen Partners have analysed the 'mega-data' available as part of the noise contour validation process. This took the results for the SEL parameter, as opposed to the L_{Amax} parameter reported to LLACC. The SEL parameter takes into account noise event duration as the EPNdB parameter used in the formal certification process. The L_{Amax} parameter relates to the highest instantaneous level and so is not influenced by the duration of an event.

The SEL results for the calendar years 2019 and 2020 are summarised in the table below.

Aircraft Operation	Noise Monitoring Terminal	Average SEL Noise Level, dB(A)	Sample Size
LANDING			
Airbus A321ceo	NMT1	84.6	9,216
Airbus A321neo	NMT1	84.6	1,042
DEPARTURE			
Airbus A321ceo	NMT1	85.4	3,299
Airbus A321neo	NMT1	83.6	393
Airbus A321ceo	NMT2	85.2	9,559
Airbus A321neo	NMT2	83.4	974
Airbus A321ceo	NMT3	85.7	6,710
Airbus A321neo	NMT3	83.9	670

These show that on landing the Airbus A321 types are very similar in noise, as also indicated by the formal certification values for the corresponding Wizz Air aircraft which are operating at Luton.

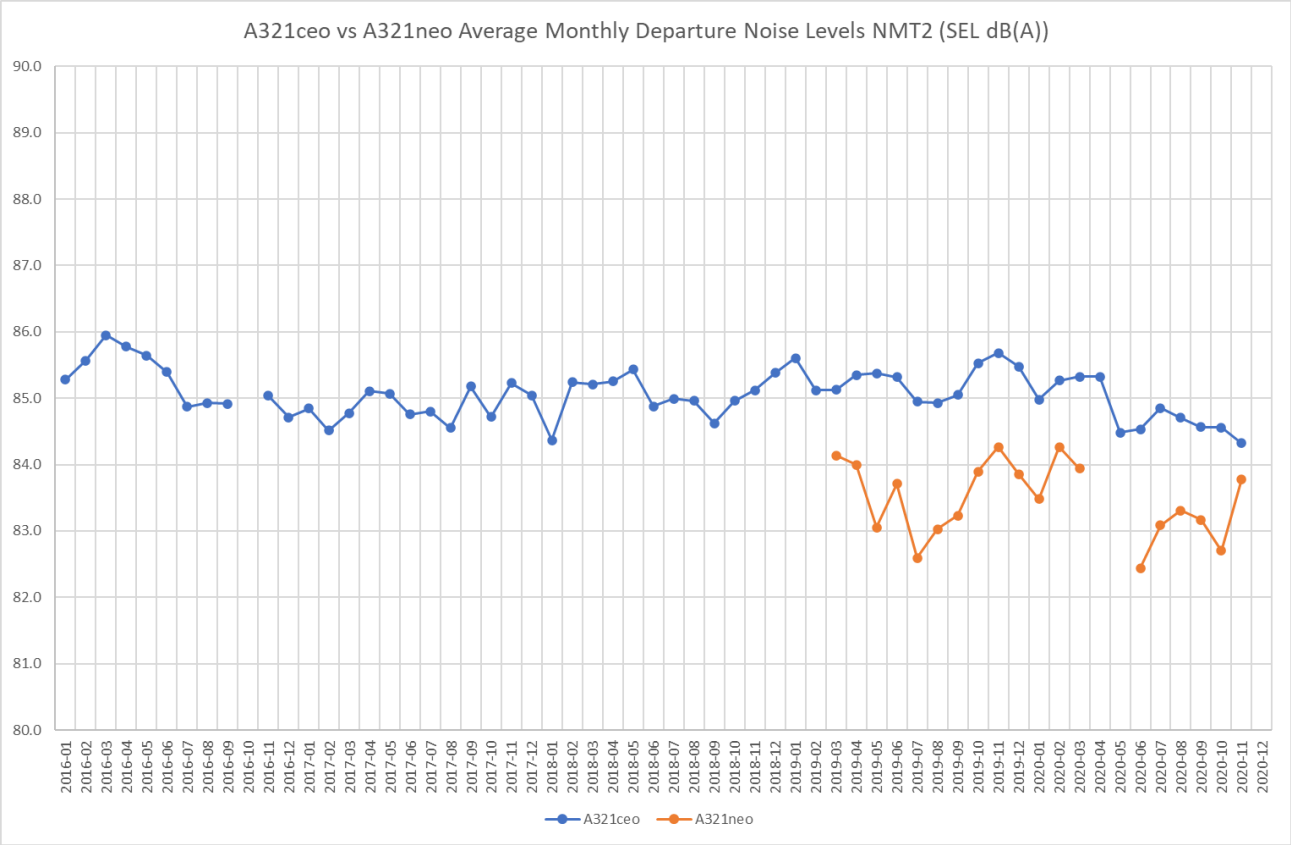
These show that on departure the Airbus A321neo type is quieter at Luton, although by a smaller amount than suggested by the formal noise certification test values for the corresponding Wizz Air aircraft (i.e. about 1.8 dB better, not 4 dB better).

Consideration of the Airbus A321ceo type SEL results during 2016 – 2020, which includes operations by various operators (and different engine variants) indicate the monthly averages ranged from:

For arrivals (NMT1) 82.7 – 85.9 dB(A) Average 84.4 dB(A) (Sample 19,075)

For departures (NMT2) 84.3 – 86.0 dB(A) Average 85.1 dB(A) (Sample 18,910)

The departure monthly averages are shown on the following graph for both the Airbus A321ceo and Airbus A321neo.



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Appendix 2

NTSC Slides – 8th June 2022

NTSC

8th June 2022

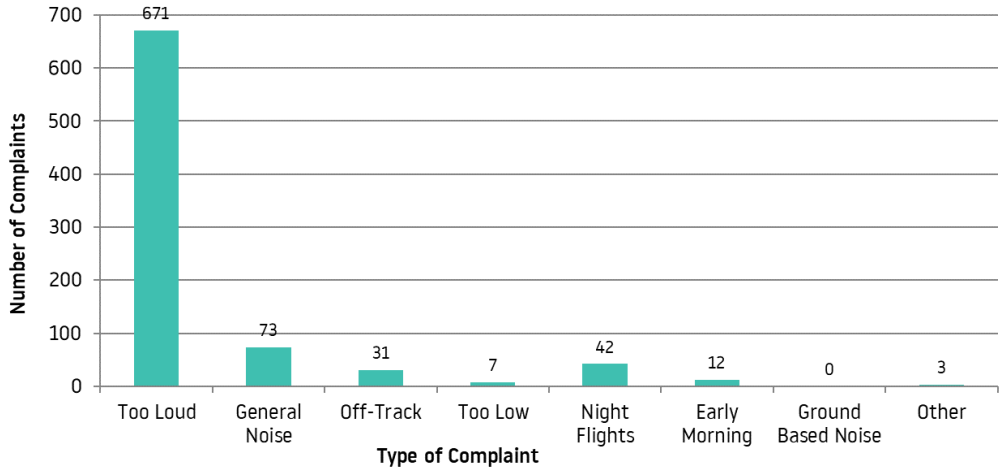
Q1 QMR

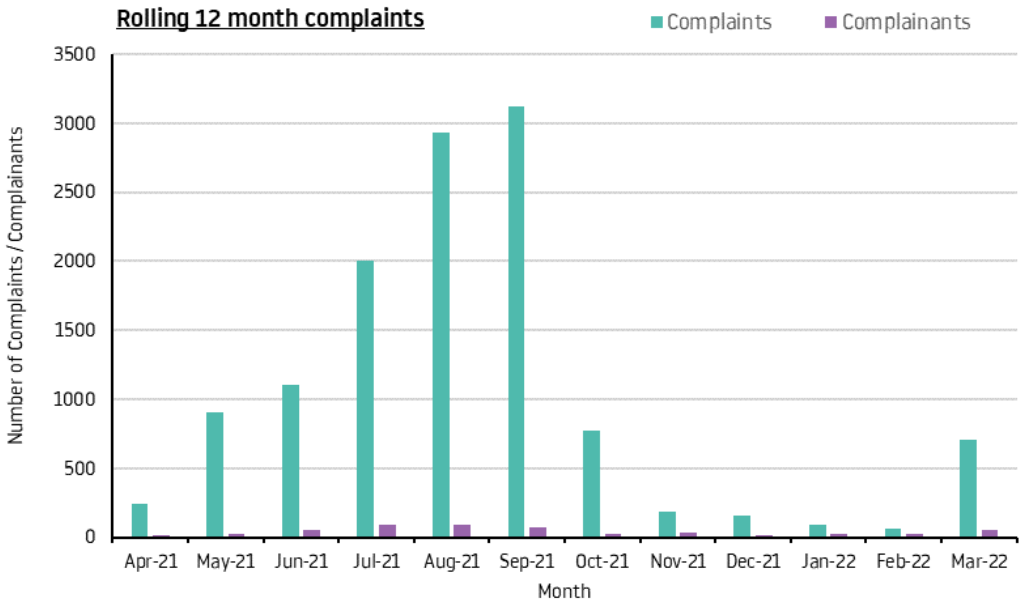
Parameter		1st Quarter 2022	1st Quarter 2021	1st Quarter 2019	difference 2019 vs 2022
Total Passenger Number	↑	1,882,072	309,280	3,671,400	-49%
Total Aircraft Movements	↑	21,054	6,047	30,422	-31%
Night Movements (23.00 – 06.59)	↑	2,310	788	3,050	-24%
Early Morning Movements (06.00 – 06.59)	↑	839	167	1,178	-29%
Aircraft Movement and Quota Count limits (per rolling 12-month period)					
Night Quota Movements (*9,650 limit*)	↓	4,027	3,403	8,524	-53%
Night Quota Count (*3,500 limit*)	↑	1497.75	1,411.50	3123.75	-52%
Early Morning Shoulder (*7,000 movements*)	↓	3,095	1,796	6,016	-49%
24hr CDA (% achievement)	↑	88%	79%	90%	-2% pts
Day CDA (% achievement)	↑	88%	79%	89%	-1% pts
Night CDA (% achievement)	↑	85%	80%	90%	-5% pts
Track Violations	↑	11	2	11	-
Departure Noise Infringements (Day)	↑	1	0	0	+100%
Departure Noise Infringements (Night)	-	0	0	0	-

Complaints – Q1

During Q1 (Jan – March), LLA received 839 complaints from 91 complainants. The average number of complaints per complainant was 9. In Q1, we saw an decrease in complaints and an increase in complainants compared to 2020.

86% of complaints were received by 10 individuals (71% from one individual). The majority of complaints were regarding easterly departures.





Complaints – Aircraft Movements

Below are the details of the most complained about aircraft movements in Q1.

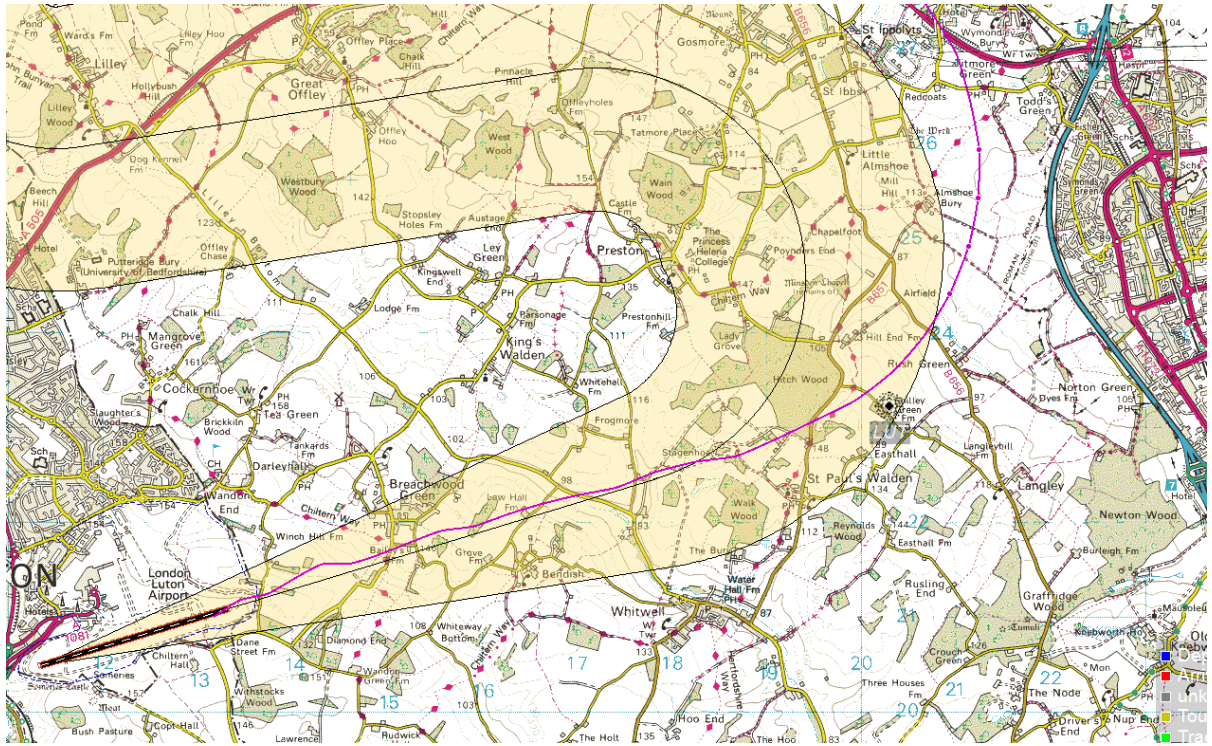
Date / Time	Dep or Arr	Runway	Aircraft type	Route	Number of complaints	Possible reason for complaints
11/02/2022 02:23:00	Departure	25	B752 (cargo)	Match	10	Aircraft remained within corridor, but departed during the night time period.
14/03/2022 02:02:00	Departure	25	A306 (cargo)	Match	3	Aircraft remained within corridor, but departed during the night time period.
26/03/2022 18:30:00	Departure	07	A320 (passenger)	Compton	3	Aircraft remained within corridor and conducted a continuous climb.
28/03/2022 06:44:00	Departure	07	B738 (passenger)	Compton	3	Aircraft remained within corridor until reaching 4,600ft.
28/03/2022 07:17:00	Departure	07	A320 (passenger)	Compton	3	Aircraft remained within corridor until reaching 4,900ft.
28/03/2022 13:30:00	Departure	07	GLEX (private)	Compton	3	Aircraft remained within corridor and conducted a continuous climb.
28/03/2022 18:38:00	Departure	07	E550 (private)	Compton	3	Aircraft remained within corridor until reaching 6,200ft.
28/03/2022 19:50:00	Departure	07	A320 (passenger)	Compton	3	Aircraft remained within corridor until reaching 4,900ft.

Noise and Track Violations

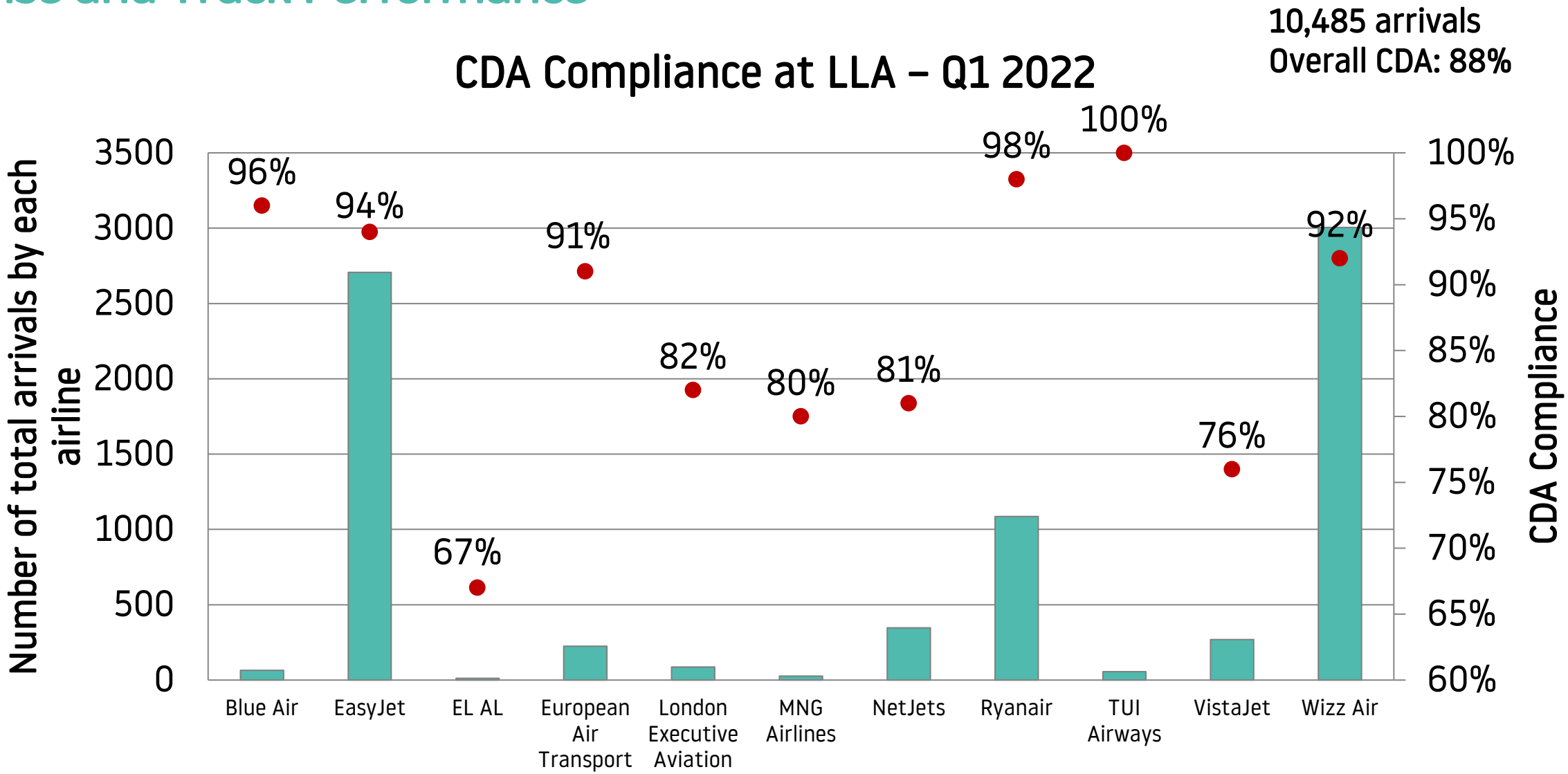
During Q1 of 2021, LLA investigated 46 deviations as part of the Noise and Track violation scheme. Of these 46, 11 resulted in fines being issued totalling £15,000. Fines were issued to passenger, cargo and private operators.

There were 35 deviations that were exempt, mostly due to ATC vectoring for weather avoidance, caused by thunderstorms.

There was one daytime noise violation during the quarter. The operators was fined £1,000 for the occurrence.



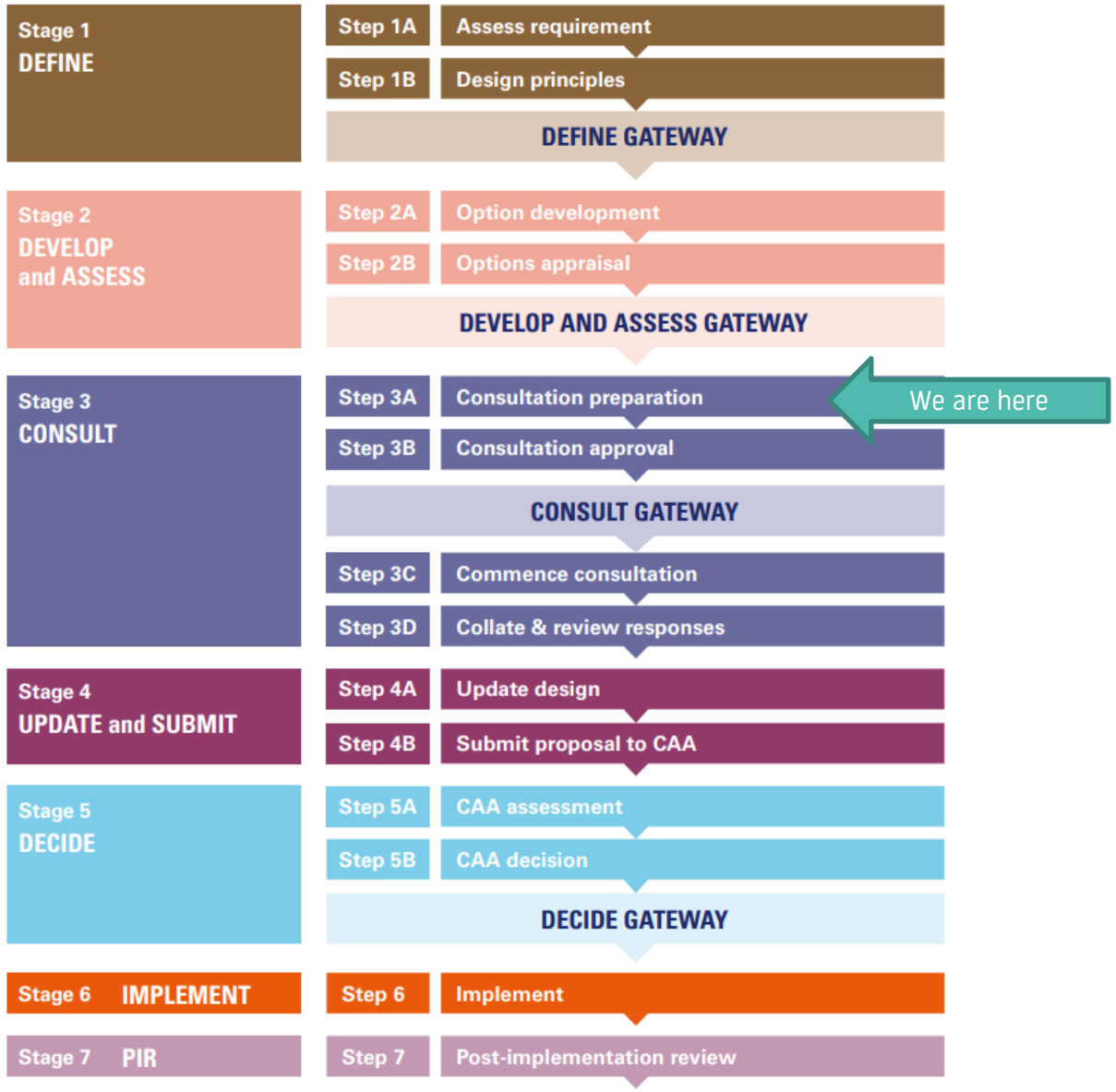
Noise and Track Performance



Airspace Update

FASI-S Airspace Change

- LLA is now in Stage 3 of CAP 1616 process, following CAA approval at end of March.
- We are actively engaging with our neighboring airports but they are behind us in the process.
- As part of our work we have a long list of design options for each of our arrival and departure routes, we have also conducted some initial modelling on this.
- We are working with communities, operators, recreational flyers and other airports to shortlist our routes.

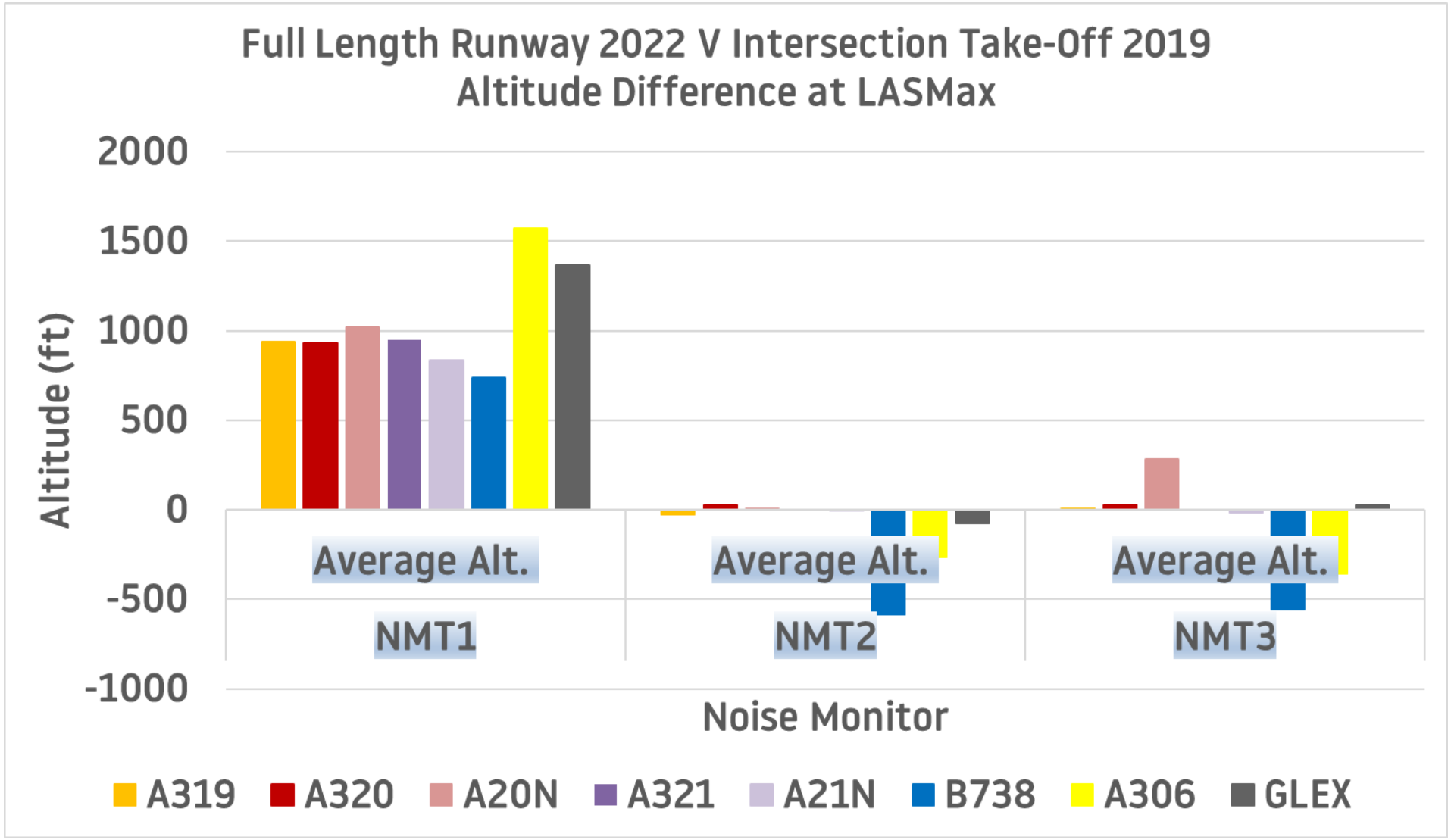


Full Length Departure Trial

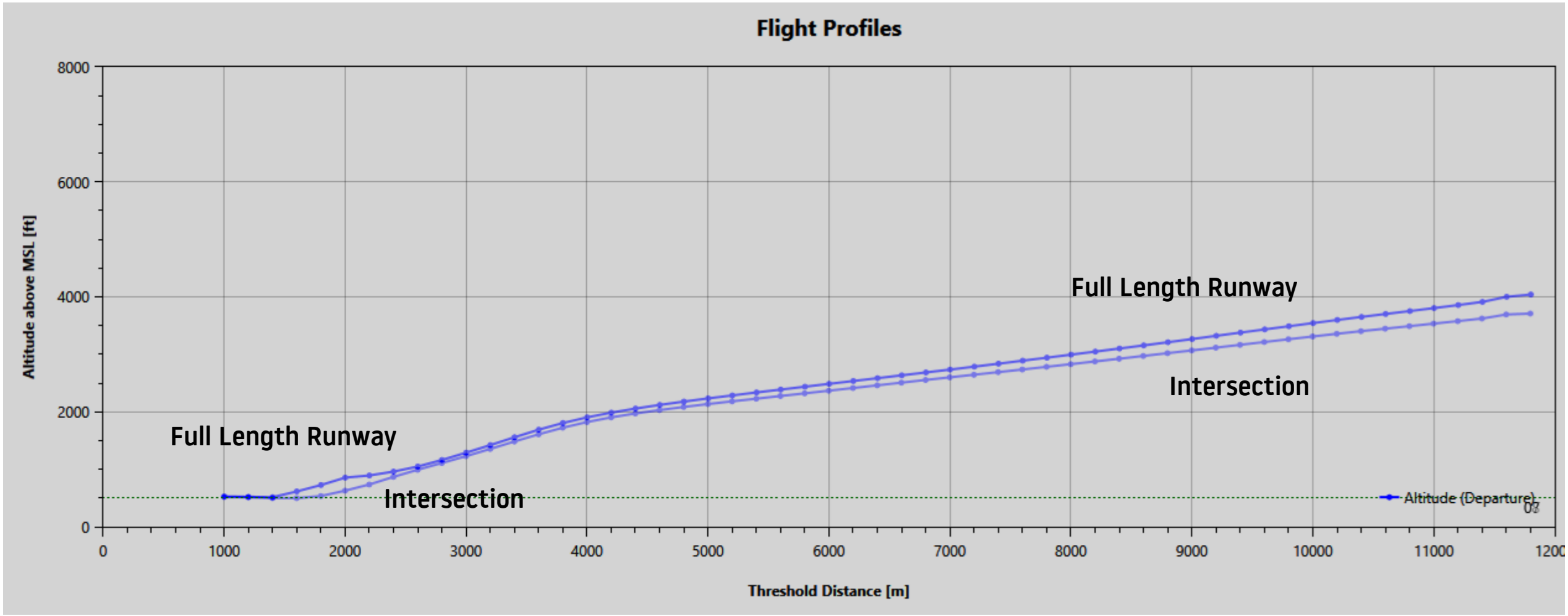
Full Length Departure Trial

In February 2022, LLA asked all operators to use the full length of the runway for departure, rather than from the intersection point (purple arrows). It was expected that longer runway length would require less thrust on take-off roll and the position of the aircraft would be higher by the runway threshold and therefore will produce less noise. We collected data for 6 weeks, and we have now reviewed the results.

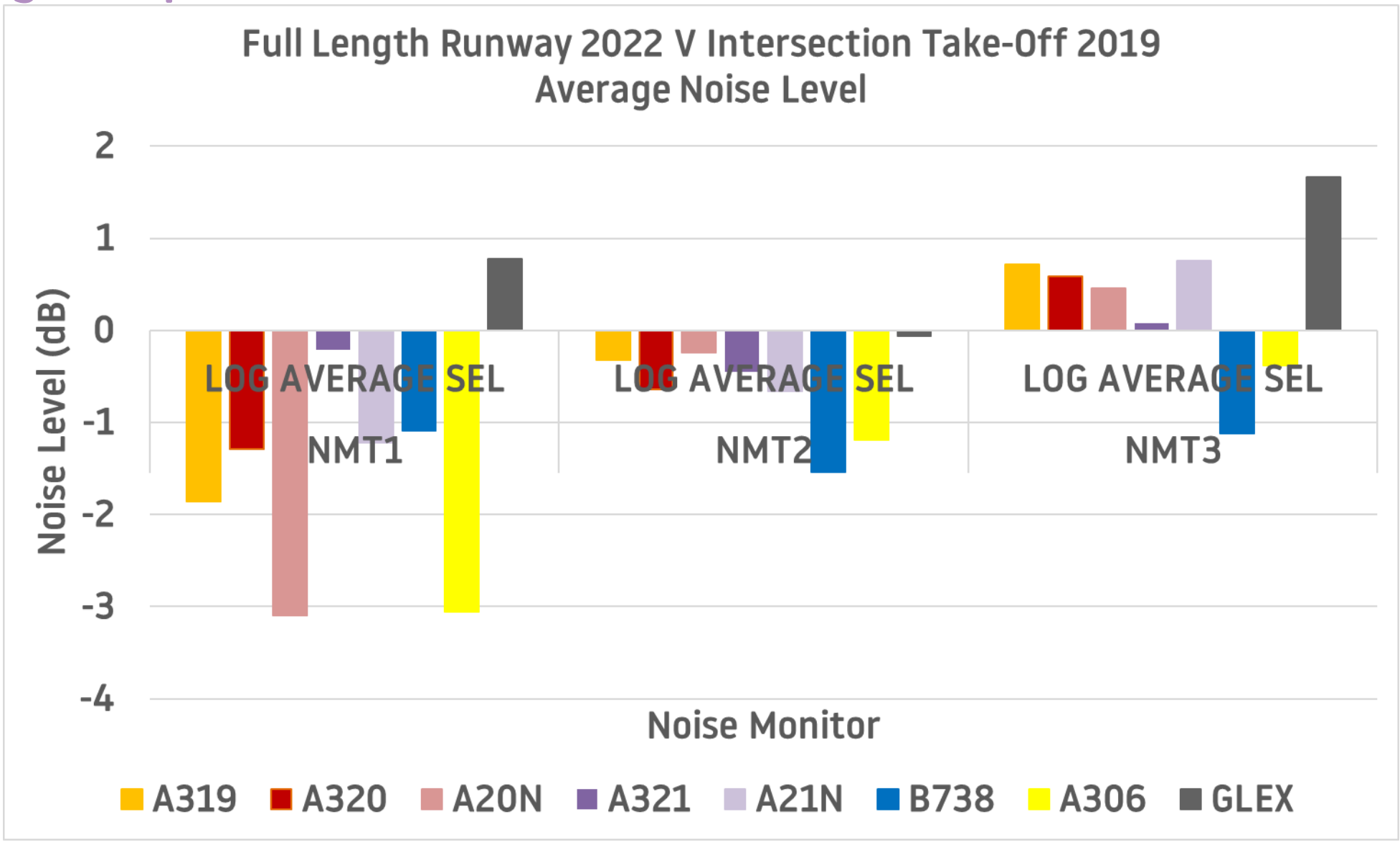
Full Length Departure Trial



Example: A321 Easterly Operation



Full Length Departure Trial



Operators' SOP and Feedbacks on Noise Reduction

Operator 1 (Passenger airline)

- Only using full thrust when required, FMS system will automatically calculate the thrust based on load, environmental conditions, runway available.
- An idea to lower the thrust reduction altitude.

Operator 2 (Private operator)

- Using full thrust from full length of the runway.
- Can do reduced power take off's but considered many years ago regarding the training costs vs maintenance costs and could have safety implications.

Operator 3 (Passenger airline)

- Will take the largest reduction on power available based on the conditions.

Operator 4 (Passenger airline)

- Negligible difference in thrust from intersection to full length.
- Strong winds at Luton can increase thrust needed.

Noise Complaints Policy

Noise Complaints Policy Update

- Every complaint will still be registered and form part of the quarterly and annual data reporting.
- Information including LLA route maps will be provided to every first-time complainant in the first instance.
- Should a further email be sent from the same 'first-time' complainant, a response will only be provided if it relates to an aircraft not following LLA procedures or routes.
- Where complaints are made about noise incidents caused by multiple aircraft within one email or online form, this will be categorised as a general disturbance and only one complaint will be registered. Where complainants wish to report noise, incidents caused by multiple aircraft and would prefer these to be registered as separate complaints, each noise incident should be reported using a separate online complaint form or email, each containing the required information in the body of the email or form.
- Those complaints made via TraVis will be prioritised.
- The FAQ document on the website will be updated to help signpost residents/complainants.
- We will update auto response to reflect the changes.

Summer Restrictions

Summer Restrictions 2022

In order to protect the summer contour period, the following restrictions would be in place for summer 2022:

- No ad hoc movements will be permitted including Commercial, GA and Maintenance between 2200-0559 GMT 14th June – 16th September

- No further night slots to be allocated to series flights 2200-0559 GMT 1st June – 30th September

- No re-scheduling of existing allocated slots from the day time 0600-2159 GMT into the night time 2200-0559 GMT 14th June – 16th September

- For Summer 2022 and all subsequent seasons no aircraft with a value greater than QC1 will be permitted to operate in the night-time period.

- No new slot applications with an aircraft QC value greater than 0.5 will be permitted between 2200 – 0559 GMT

Appendix 3

Community Noise Report 2019 – South Harpenden

Community Noise Report

South Harpenden

October – December 2019

London Luton Airport

Version 1.0

Introduction

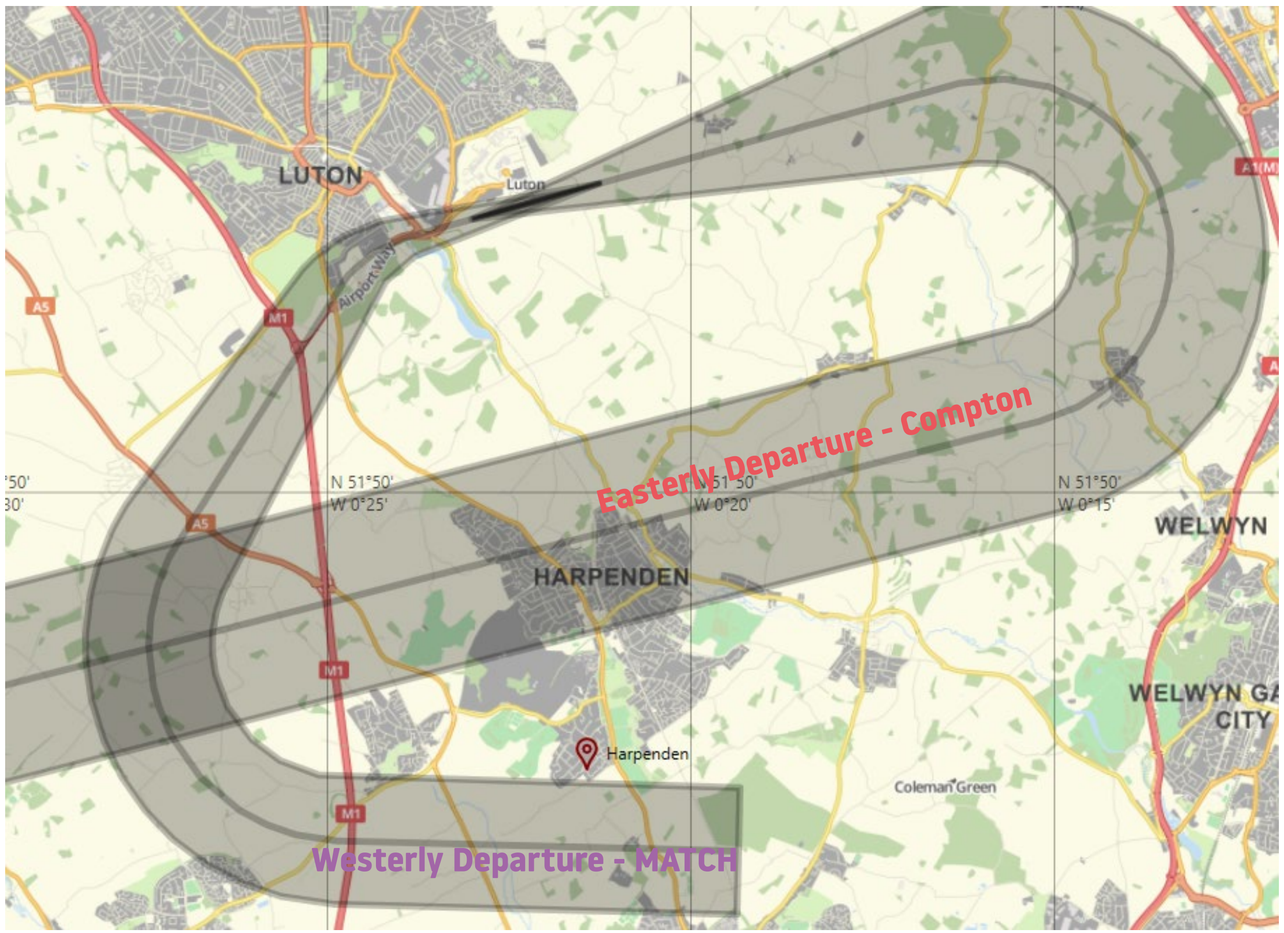
As part of the ongoing noise monitoring programme, London Luton Airport deployed a portable noise monitoring terminal in South Harpenden.

The purpose of the monitoring programme is to understand the typical noise levels created in the local community. For South Harpenden, it specifically related to the westerly Match departure. The easterly Compton departure (which is a closer route to North and Central Harpenden) is also being looked at for comparison in this report. The Noise Preferential Routes (NPRs) are shown on the map.

The noise monitor was located at a property on The Deerings at South Harpenden, close to the edge of the westerly Match departure corridor (1.2km from the centerline) and 3.6 km from the easterly Compton departure, at an altitude of approximately 404 feet above sea level. The red pinpoint on the map show the location of the noise monitor.

The noise monitor in South Harpenden was in place between 19th October and 22nd December 2019.

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.

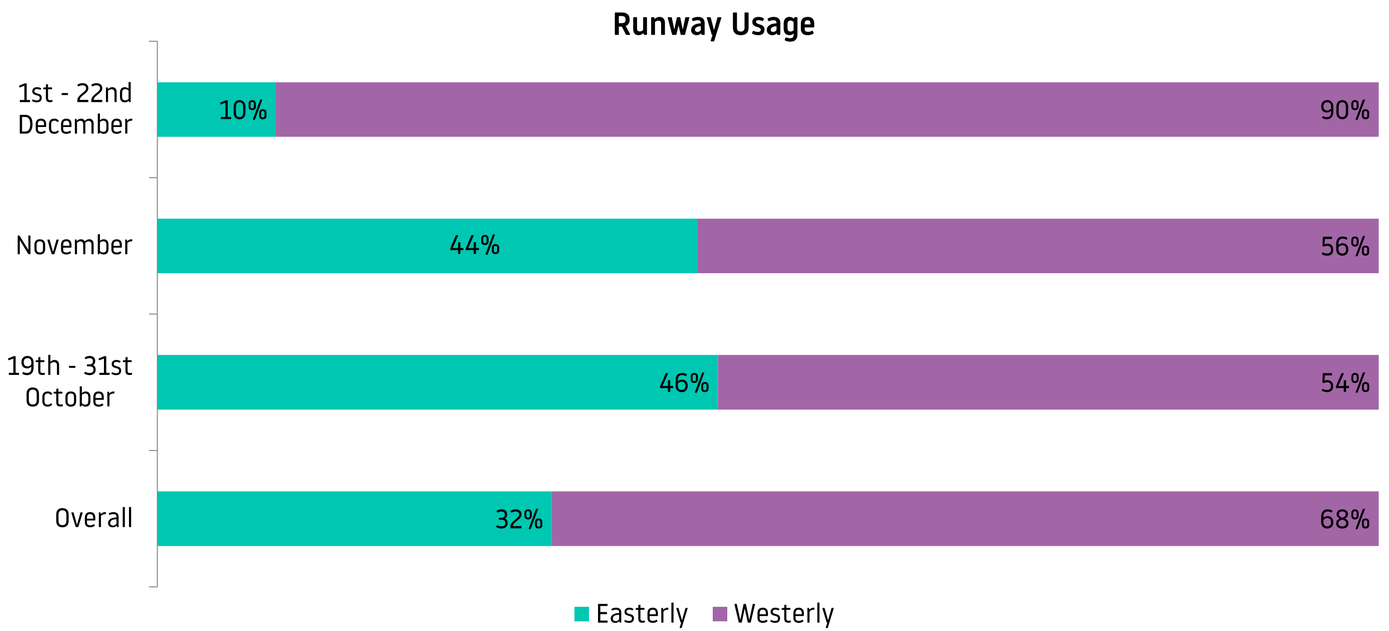


LLA Operations During the Monitoring

There are 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 depends on the weather.

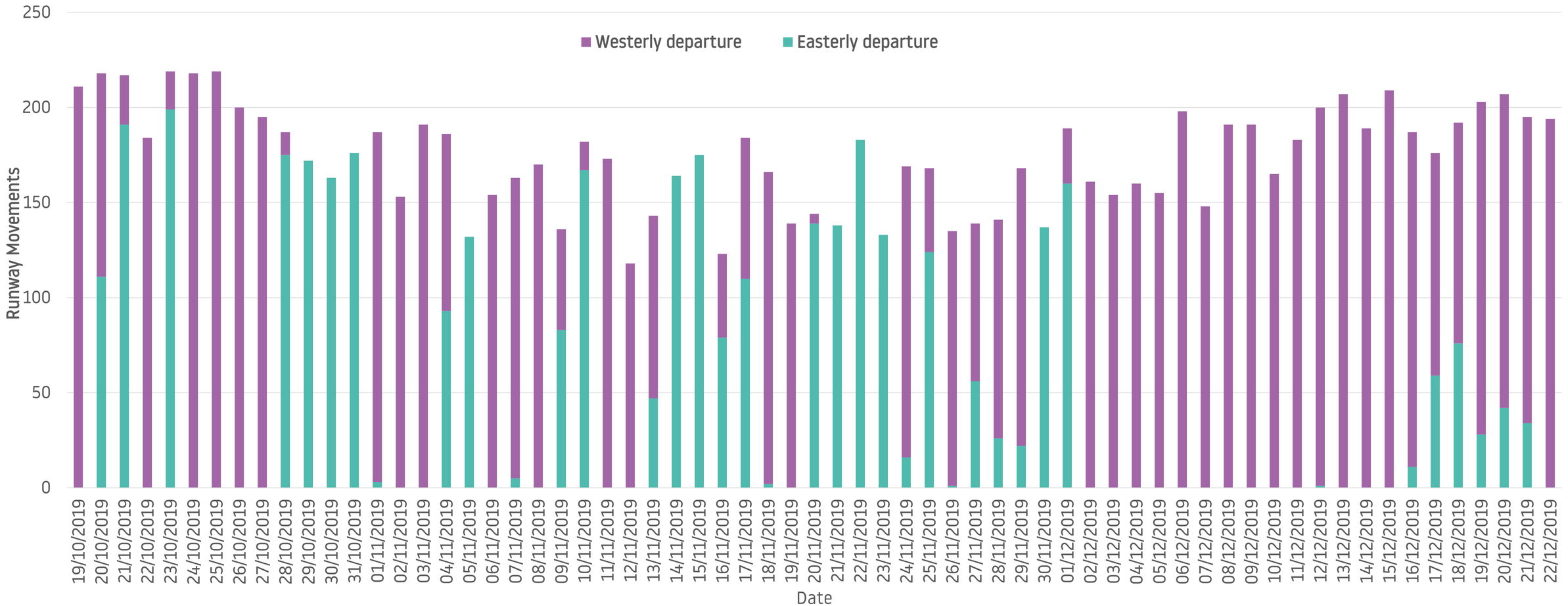
During the monitoring period, the direction of operation was 32% easterly and 68% westerly. The 5 year average for this time of year is 25% easterly vs 75% westerly.

There were 4,220 aircraft which departed on the westerly Match route and 1,082 aircraft which departed on easterly Compton route whilst the noise monitor was located in South Harpenden.



Daily Movements During Monitoring Period

The chart below shows the number of daily westerly and easterly departures at LLA. Due to the location of South Harpenden, some flights that departed on our westerly Match and easterly Compton routes would have flown near the monitor. Therefore, aircraft noise may be noticeable.



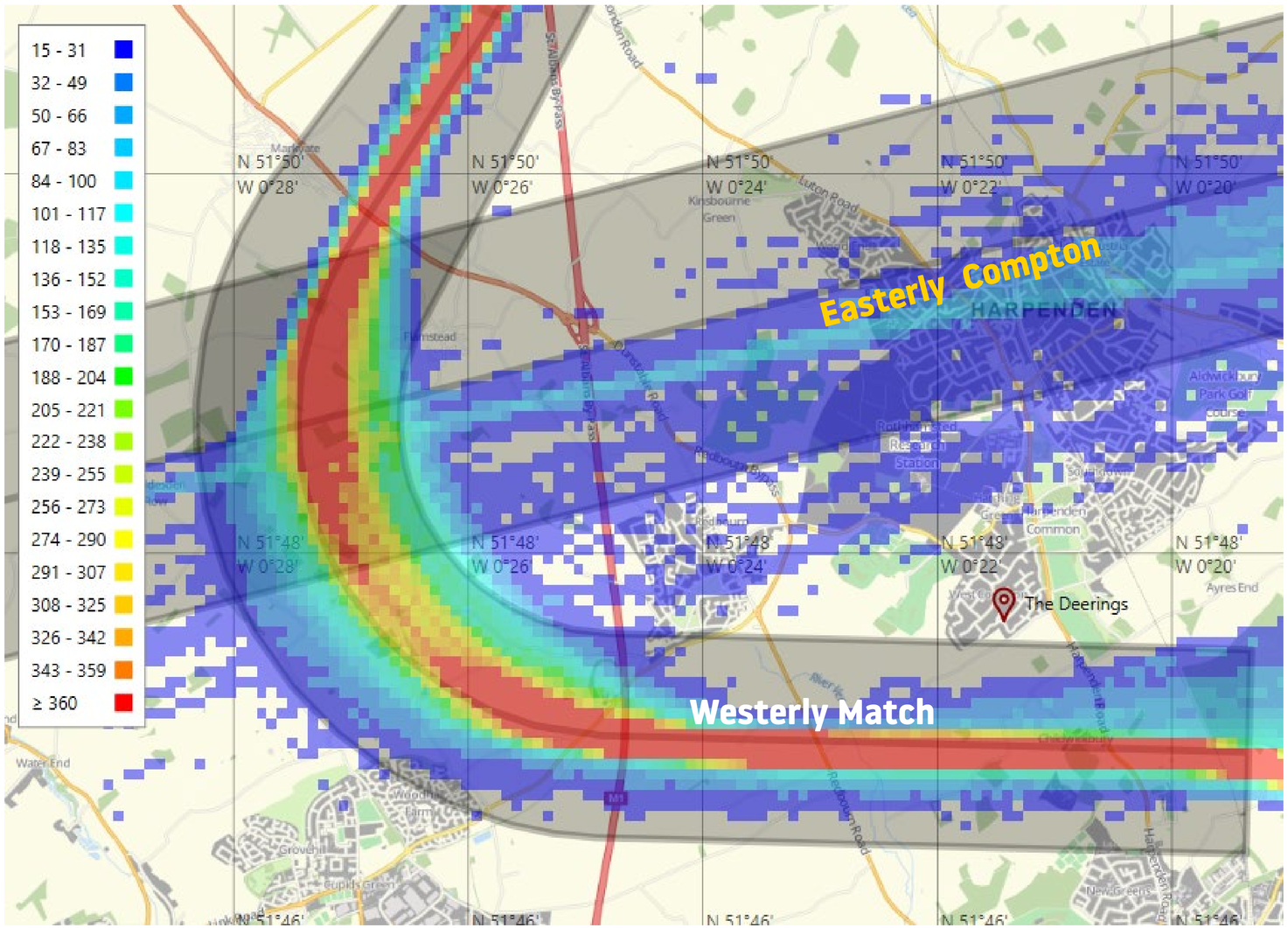
Operations During the Monitoring Period

The graph below represents the average number of departures during the monitoring period. Depending on the operating direction on the day, residents in South Harpenden may experience different flight patterns. During the peak periods, local residents of South Harpenden may notice more frequent aircraft movements. In general, the morning peak starts at 0700 and may last up to 3 hours. The afternoon peak is generally between 1400-1500 and 1700-1900. On a day of westerly operation which occur approximately 70% of the time yearly, residents may notice more aircraft flying close to South Harpenden. On a day of easterly operation, resident may notice less aircraft as only 35% of flight (2019's average) use the Compton departure route and it is further north from South Harpenden.

During the night period of 23:00 – 06:00 in the monitoring period, there was an average of 6 departures whereas in the previous year, there was an average of 8 departures.

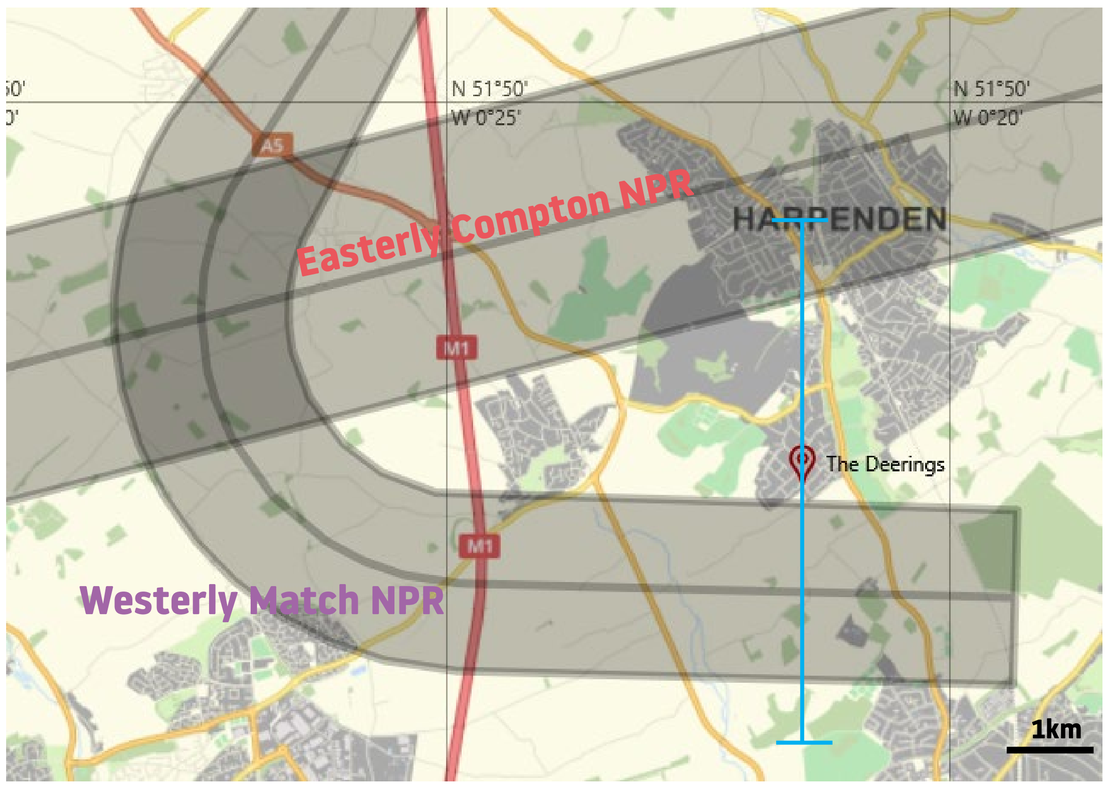
Aircraft Tracks During the Monitoring Period

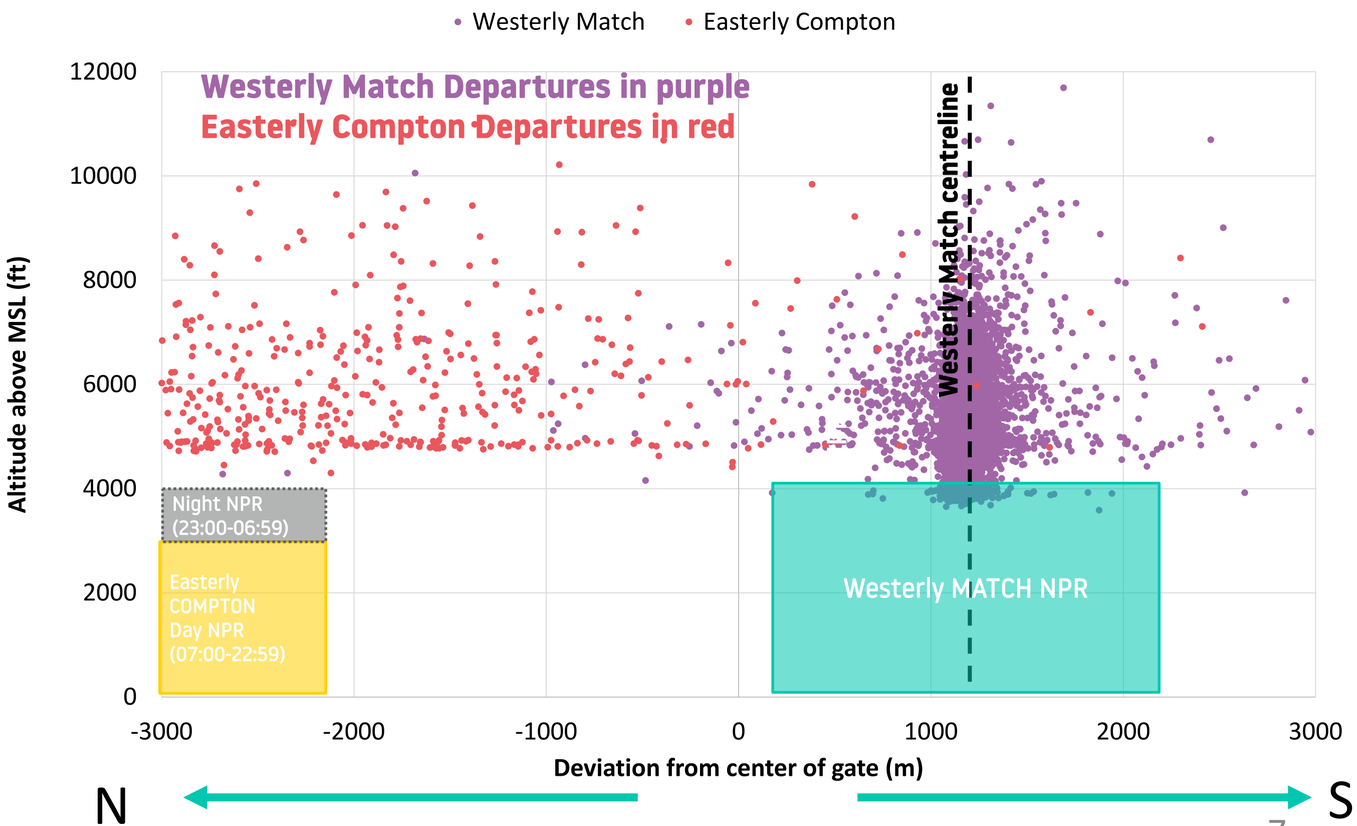
The heat maps below show the representative flight tracks that passed near the noise monitor terminals during the monitoring period. The red pinpoint indicates the location of the noise monitor in South Harpenden.



Altitude Analysis During Monitoring Period

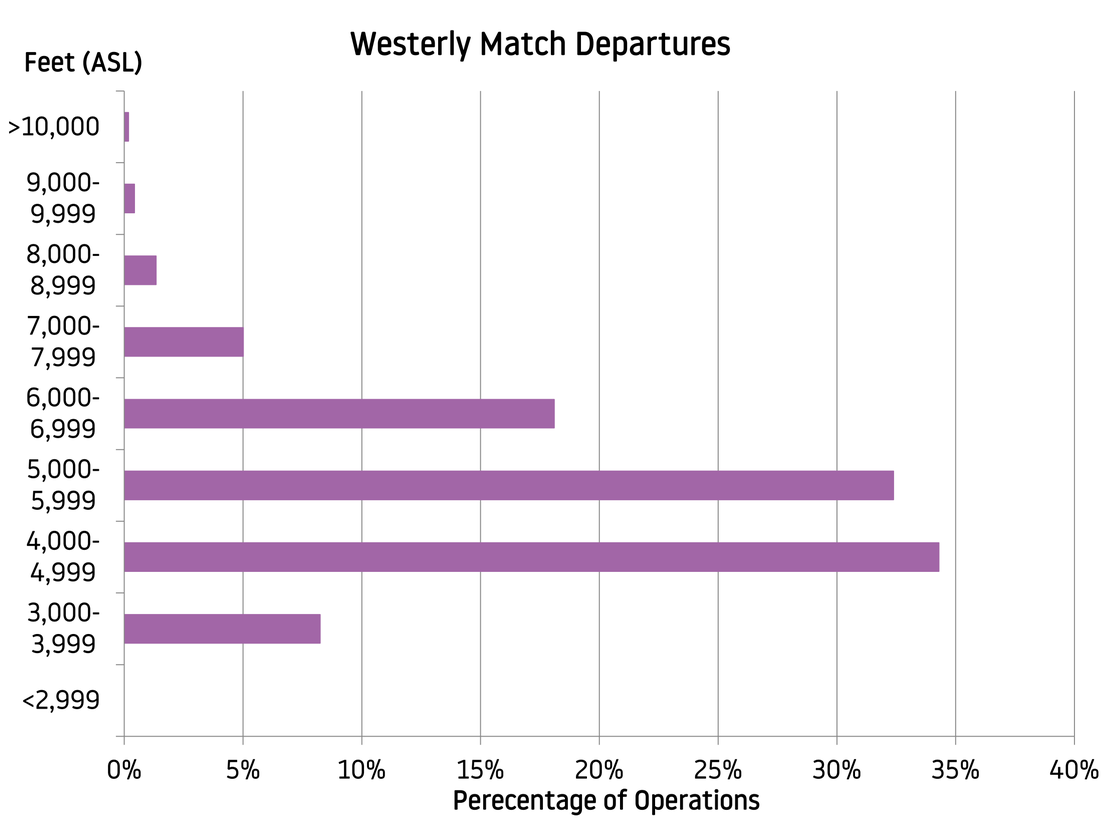
The altitude analysis for South Harpenden shows the vertical and lateral dispersion of aircraft 3km either side of the noise monitor. The map below shows the 6km gate which is drawn perpendicular to the NPRs from north to south and will gather information of every aircraft passing through the gate area. The scatter graph below shows the distance and altitude of aircraft from the noise monitor during the monitoring period. The westerly Match noise preferential route (NPR) and the easterly Compton NPR are labelled and displayed by the shaded area. Departing aircraft must remain within the NPR until reaching release altitude of 3,000ft during the day or 4,000ft at night (4,000ft at all times for Match route). Due to the close proximity of South Harpenden to the departure routes, local residents may see aircraft flying near South Harpenden at an altitude of above 4,000ft.

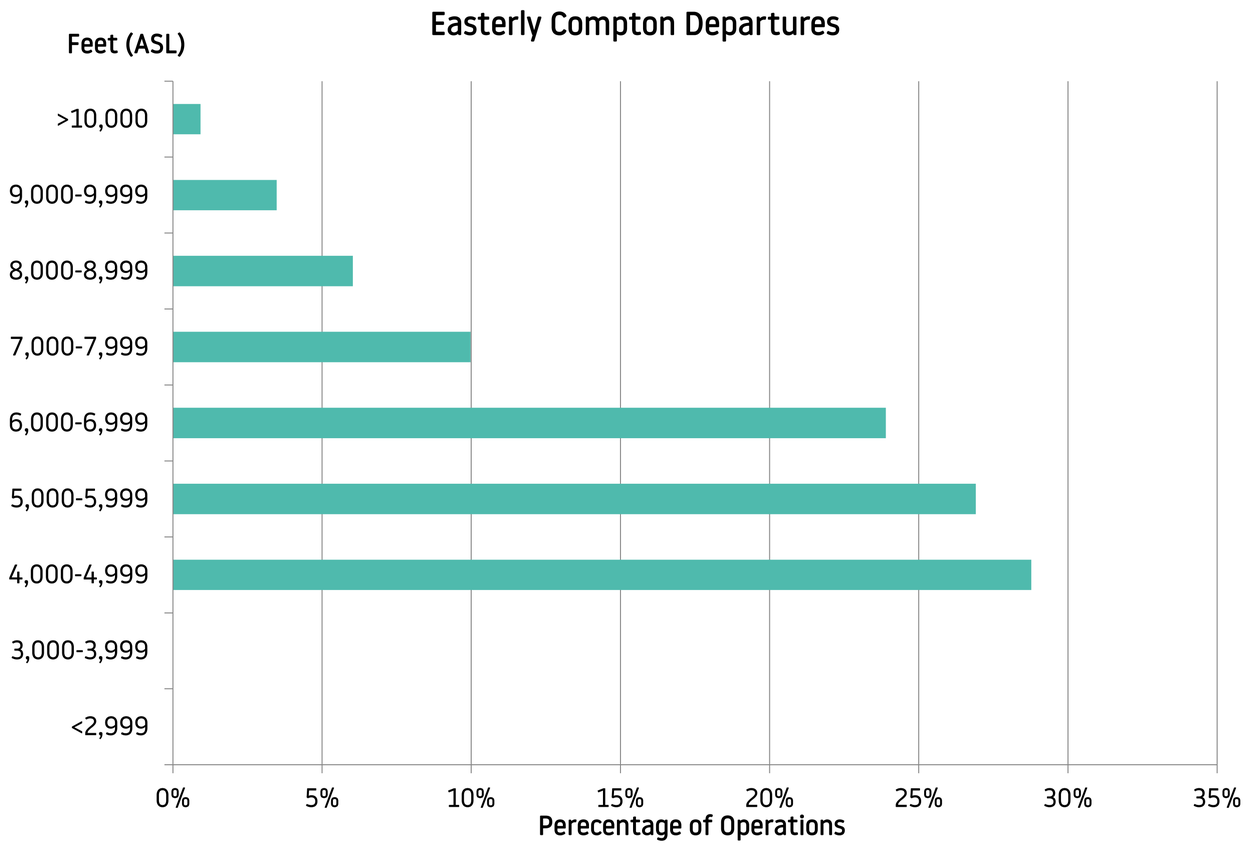




Altitude Analysis During Monitoring Period

The altitude analysis is split into two parts in this sub-section - westerly Match departures and easterly Compton departures. The bar charts show the altitude spread when aircraft reach the noise monitor in Harpenden. For westerly departures, the average altitude of aircraft in this area was 5,407 feet above sea level (ASL) (5,003 feet above ground level [AGL]). The purple bar chart shows the majority of the flights departed on westerly Match route were above 4,000 feet ASL. For easterly Compton departures, aircraft tend to be at higher altitude when they reach Harpenden. The average altitude of aircraft in this area was 6,112 feet ASL (5,708 feet AGL). That would have a less noise impact on South Harpenden.





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 Harpenden, the noise monitoring terminal collected readings from 2,247 westerly Match departing and 107 easterly Compton departing aircraft. During the period, there were total of 4,220 westerly Match departures and 1,082 easterly Compton 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). During the monitoring period, no recordings need to be excluded from the analysis for weather reason.

The purpose of the monitoring programme is to understand the typical noise levels created in the local community. For South Harpenden, it specifically related to westerly departures and easterly departures. For this reason, the data analysis is split into two parts – westerly departures and easterly departures.

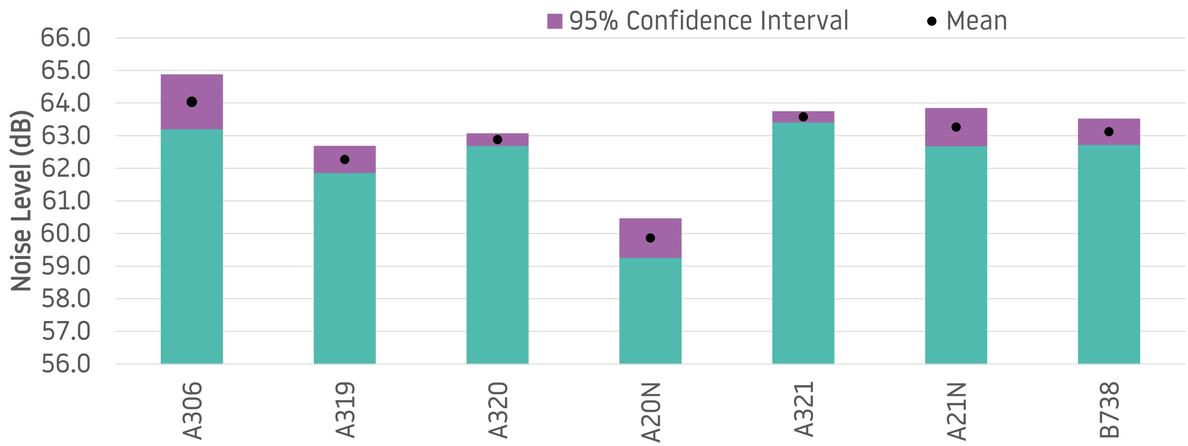
Westerly Departures - Noise Results During Monitoring Period

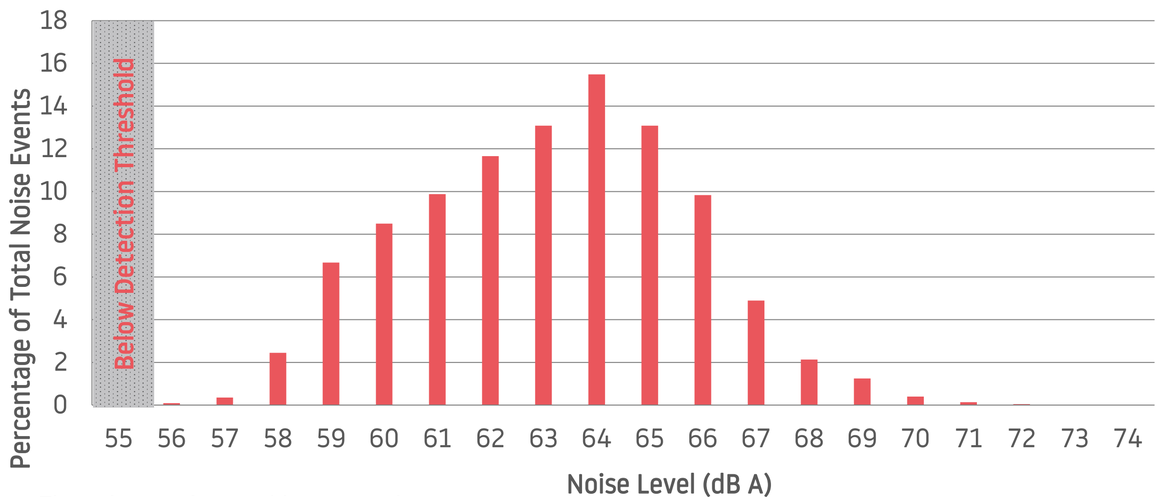
During the monitoring period, noise recording samples were gathered from the most popular aircraft types at London Luton Airport*. The summary of the results on westerly departing aircraft noise are shown on this page.

Aircraft Type	Number of movements	Average Noise (dB)
A306	55	64.0
A319	144	62.3
A320 CEO	756	62.9
A20N (A320 NEO)	26	59.9
A321 CEO	851	63.6
A21N (A321 NEO)	76	63.3
B738	213	63.1

The average westerly departure noise in South Harpenden is 63.1dB, based on a sample size of 2,247. The table shows the average noise for each aircraft type and the purple bar on the chart shows the uncertainty caused by the spread in readings and the sample size (95% confidence interval). From the results, Luton's most popular aircraft Airbus A320 CEO and A321 CEO have an average noise of 62.9dB and 63.6dB respectively in South Harpenden. The departure noise from A320 NEO and A321 NEO produced less noise than A320 and A321 CEOs. It is worth noting that some of the A320 NEO noise events were not collected by the noise monitor due to the ambient background noise level being higher, hence the fewer A320 CEO samples collected than the A321 CEO. The A306 was the noisiest aircraft type at South Harpenden on days of westerly operation during the monitoring period.

*The noise results shown in the analysis are only for those aircraft types that recorded more than 50 events per aircraft (A320 NEO included for comparison).





The noise monitor could not record every aircraft noise event if the aircraft noise level is below ambient background noise (≤55dB).

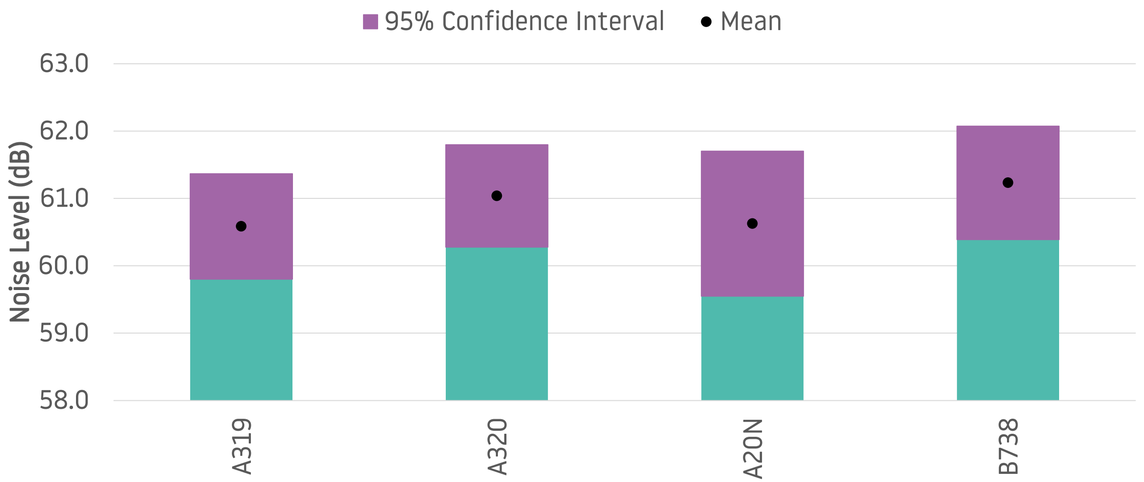
Easterly Departures - Noise Results During Monitoring Period

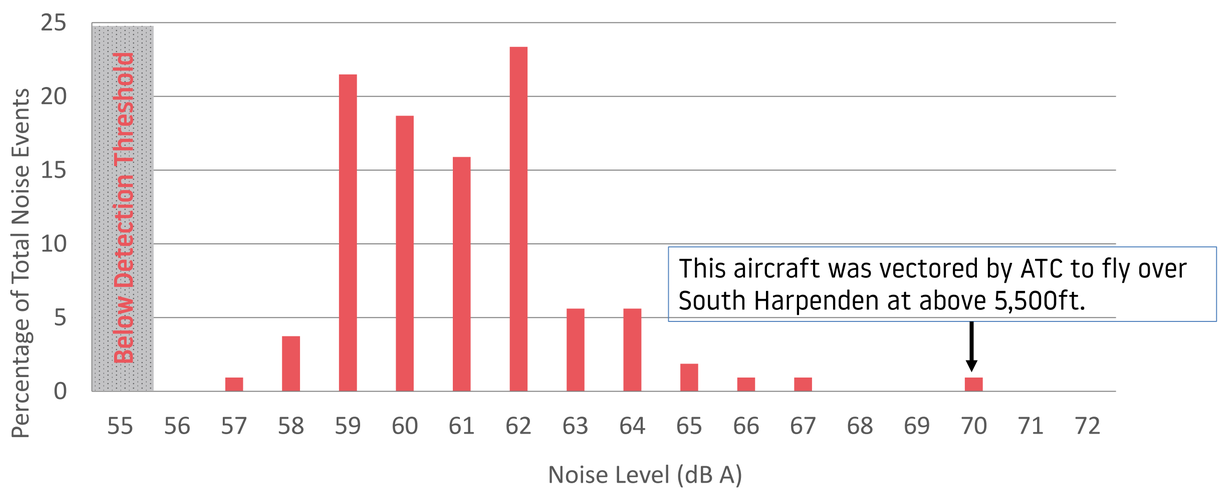
During the monitoring period, noise recording samples were gathered from the most popular aircraft types at London Luton Airport*. The summary of the results of easterly departing aircraft noise are shown on this page.

Aircraft Type	Number of movements	Average Noise (dB)
A319	26	60.6
A320 CEO	27	61.0
A20N (A320 NEO)	4	60.6
B738	28	61.2

The average easterly departure noise in South Harpenden is 60.9dB, based on a sample size of 107. It has a lower noise level than the westerly Match departure due to the further distance to the noise monitor from easterly departing aircraft. The table shows the average noise for each aircraft type and the purple bar on the chart shows the uncertainty caused by the spread in readings and the sample size (95% confidence interval). From the results, the noise level of each aircraft type on the list are very similar.

Only a small amount of easterly departure noise data was collected at this noise monitor in South Harpenden. The noise monitor could not record every aircraft noise event if the aircraft noise level is below ambient background noise. Therefore, the true average aircraft noise level for easterly operation may not be reflected at this location.





The noise monitor could not record every aircraft noise event if the aircraft noise level is below ambient background noise (≤55dB).

*The noise results shown in the analysis are only for those aircraft types that recorded more than 20 events per aircraft. (A320 NEO included for comparison)

Conclusion

- For South Harpenden, it specifically related to westerly Match departures. The easterly Compton departures was also included in this report for comparison. During the monitoring period, the airport was using westerly operations for 68% of the time, this is less than the five year average of this time period.

- The average altitude of westerly departing aircraft in South Harpenden is 5,407 feet above sea level (ASL), and as South Harpenden is already approximately 404 feet ASL, aircraft will typically be 5,003 feet above ground level (AGL) in this area.

- Almost all aircraft shown in the altitude analysis flew within or above the NPR corridor.

- The main aircraft type operating at London Luton Airport is the Airbus A320 CEO and A321 CEO which produced an average noise of 62.9dB and 63.6dB respectively in South Harpenden on a day of westerly operation. 4.5% of the noise events recorded in South Harpenden were created by the newer generation aircraft, A320 NEO and A321 NEO, registering average departing noise events of 59.9dB and 63.3dB respectively, quieter than the Airbus CEO departures. On the other hand, only a small amount of easterly noise data were collected in South Harpenden due to the further distance of the easterly Compton SID from South Harpenden. The noise monitor could not record every aircraft noise event if the aircraft noise level is below ambient background noise. Therefore, the true average aircraft noise level for easterly operation may not be reflected in South Harpenden.

- In Q4 2019, 57 aircraft (both westerly and easterly) were investigated as part of the Noise and Track violation scheme. 11 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

- 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 departure route in the direction of South Harpenden.

Standard Instrument Departure (SID): Published route that an aircraft must follow on departure.

Noise Preferential Route: 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.

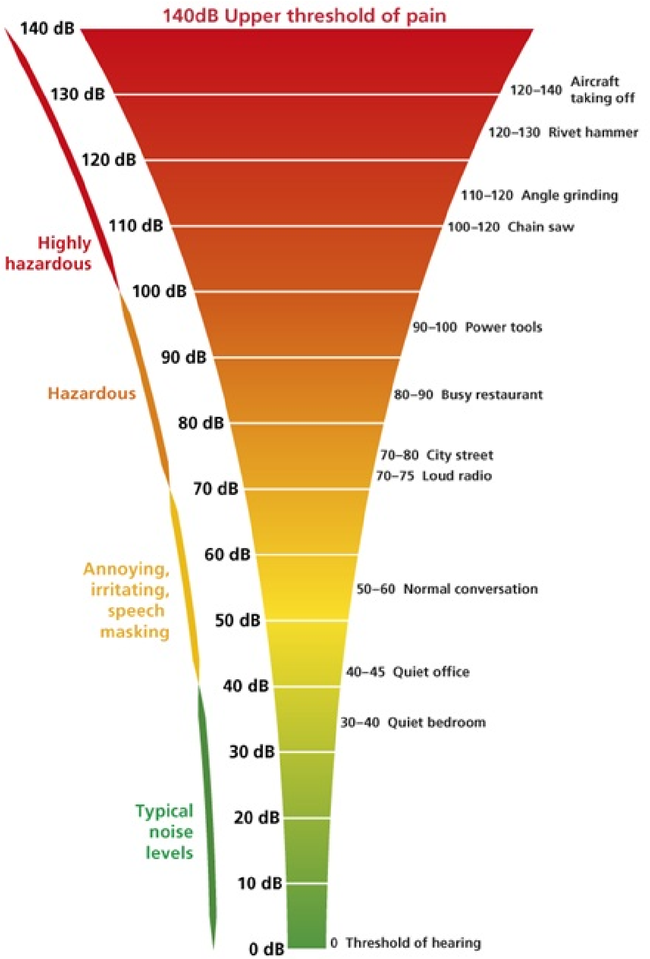
Gate Analysis: A gate which is drawn across an area and will gather information about every aircraft passing through the gate area.

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

Aircraft Types

Airbus A306 Freighter: Cargo aircraft with payload up to 54 tonnes
Main operator at LLA: DHL

Airbus A319: Short range single aisle jet with maximum 156 seats onboard
Main operator at LLA: easyJet

Airbus A320 CEO: Short to medium range single aisle jet, longer fuselage than A319, with around 180 seats.
Main operator at LLA: easyJet and Wizz Air

Airbus A320 NEO: Improved design of the A320 CEO, with more fuel efficient and quieter engines, known as NEO aircraft
Main operator at LLA: easyJet

Airbus A321 CEO: Stretched fuselage version of A320, providing more seats, up to 220.
Main operator at LLA: Wizz Air

Aircraft Types - Continued

Airbus A321 NEO: Improved design of the A321 CEO, with more fuel efficient and quieter engines, known as NEO aircraft.
Main operator at LLA: Wizz Air

Boeing B737: Medium range single aisle passenger jet with 189 seats
Main operator at LLA: Ryanair and TUI Airways

Boeing B757: Medium range single aisle passenger jet with up to 228 seats. The freighter version can provide payload up to 27 tonnes
Main operator at LLA: DHL (Freighter) and TUI Airways

Bombardier Global Express: Small long range private jet
Main operator at LLA: Private

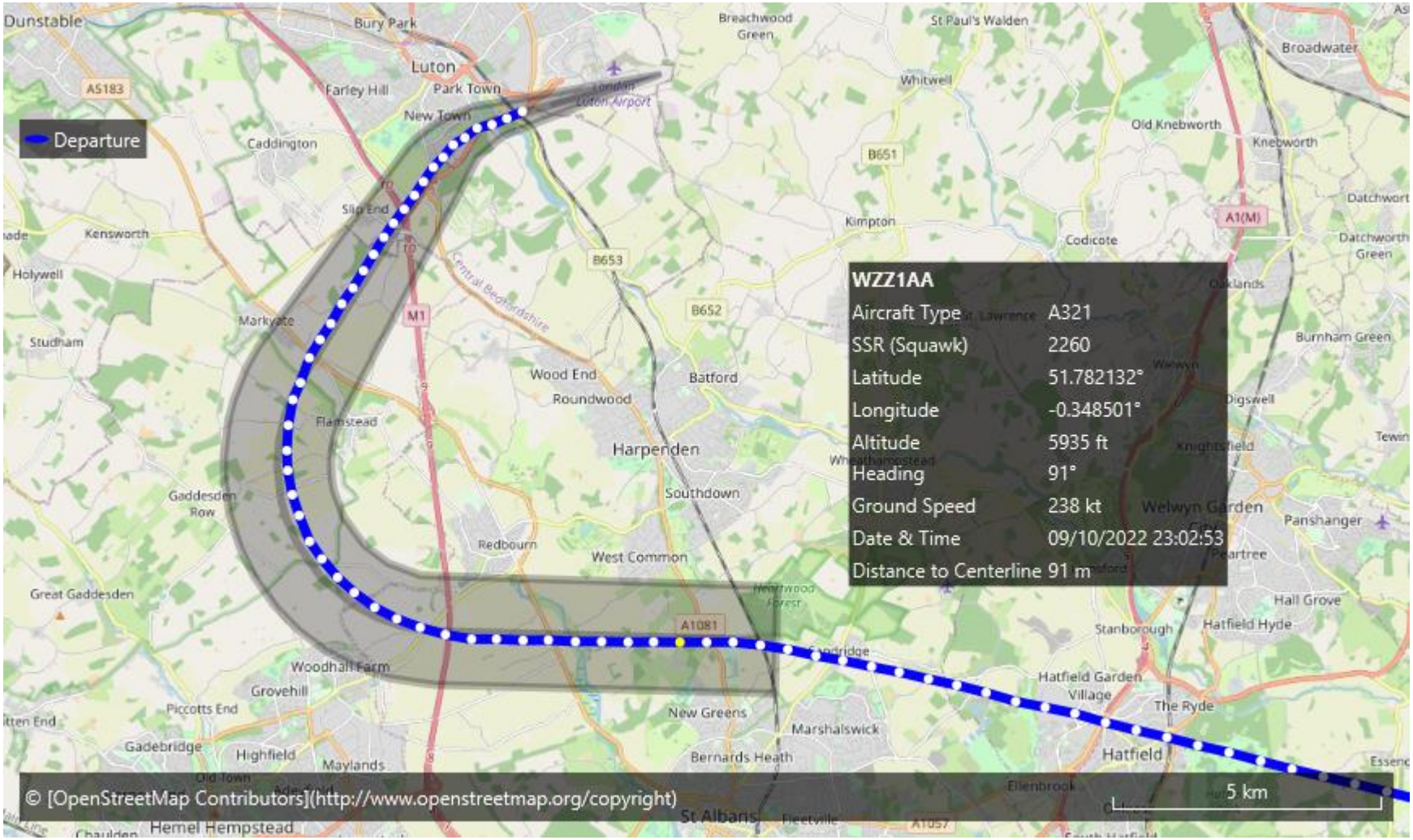
Appendix 4

Harpenden Flight radar data from 9th October 2022

Appendix 4

Flight Information

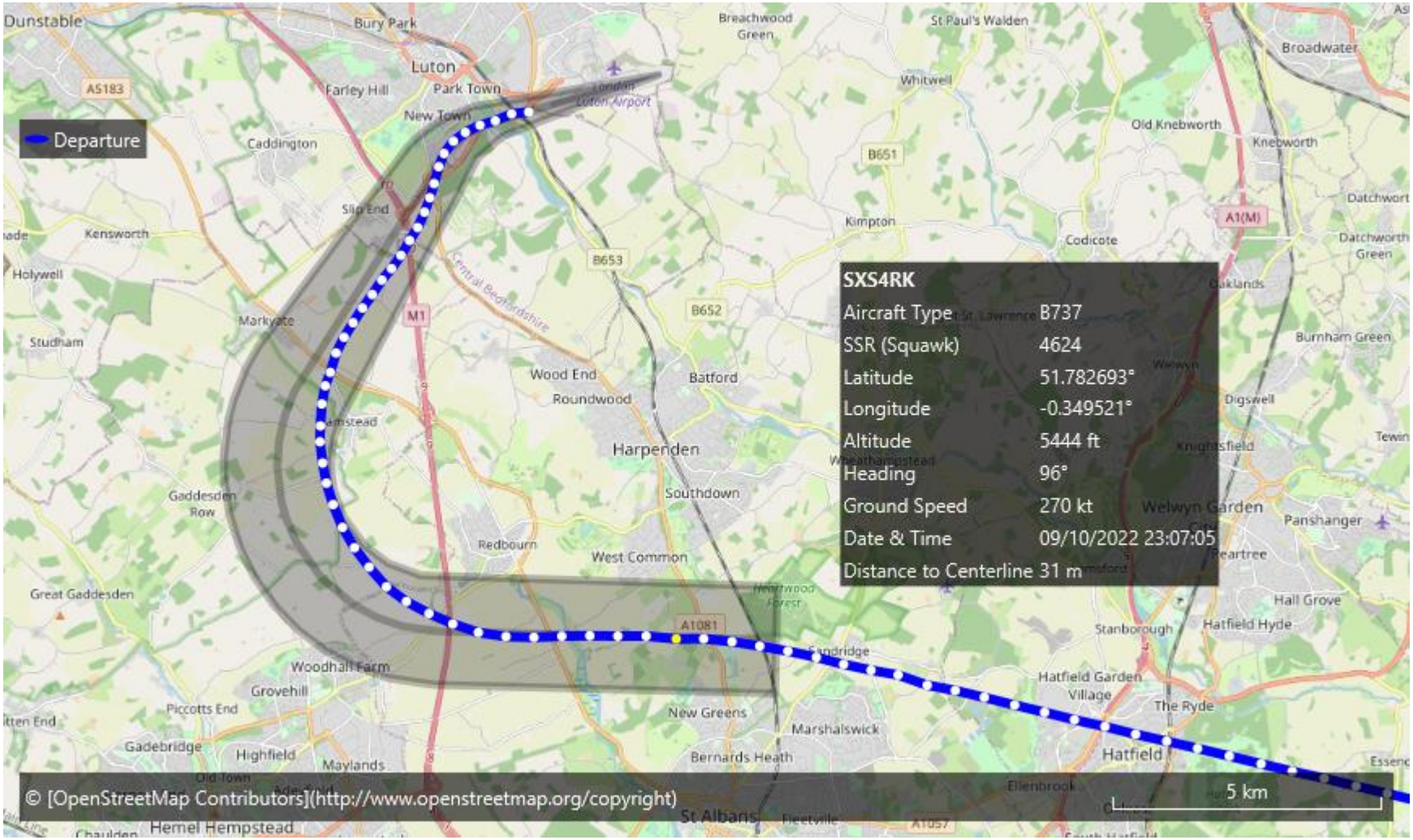
Departure at 22:59hrs on 9th October, this aircraft was scheduled to depart at 21:50hrs but experienced delay. The aircraft flew to the south of Harpenden at an altitude of 5,900ft. The aircraft was very close to the centerline of the route and therefore followed the standard procedures.



Appendix 4

Flight Information

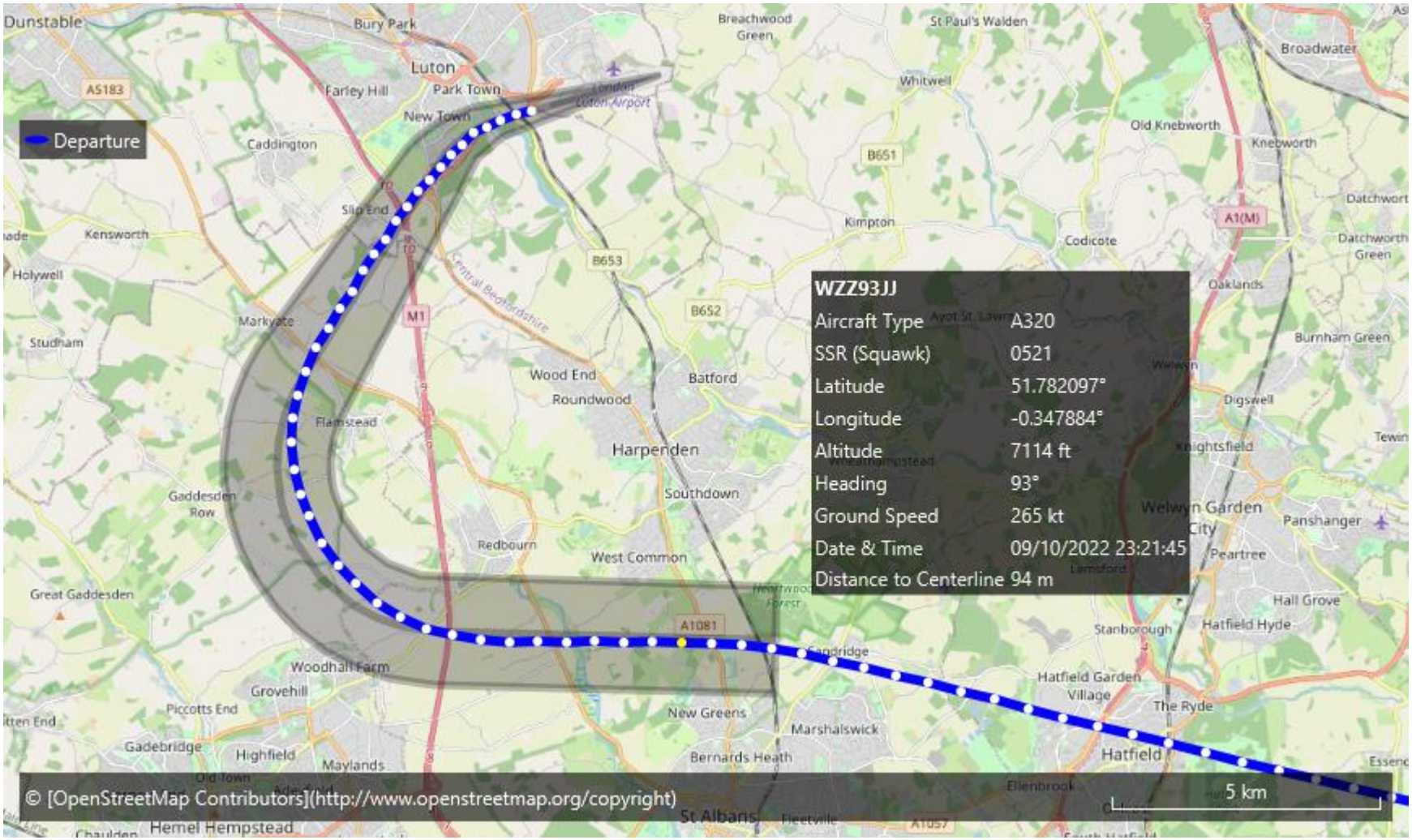
Departure at 23:04hrs on 9th October, this aircraft was scheduled to depart at 21:40hrs but experienced delay. The aircraft flew to the south of Harpenden at an altitude of 5,400ft. The aircraft was very close to the centerline of the route and therefore followed the standard procedures.



Appendix 4

Flight Information

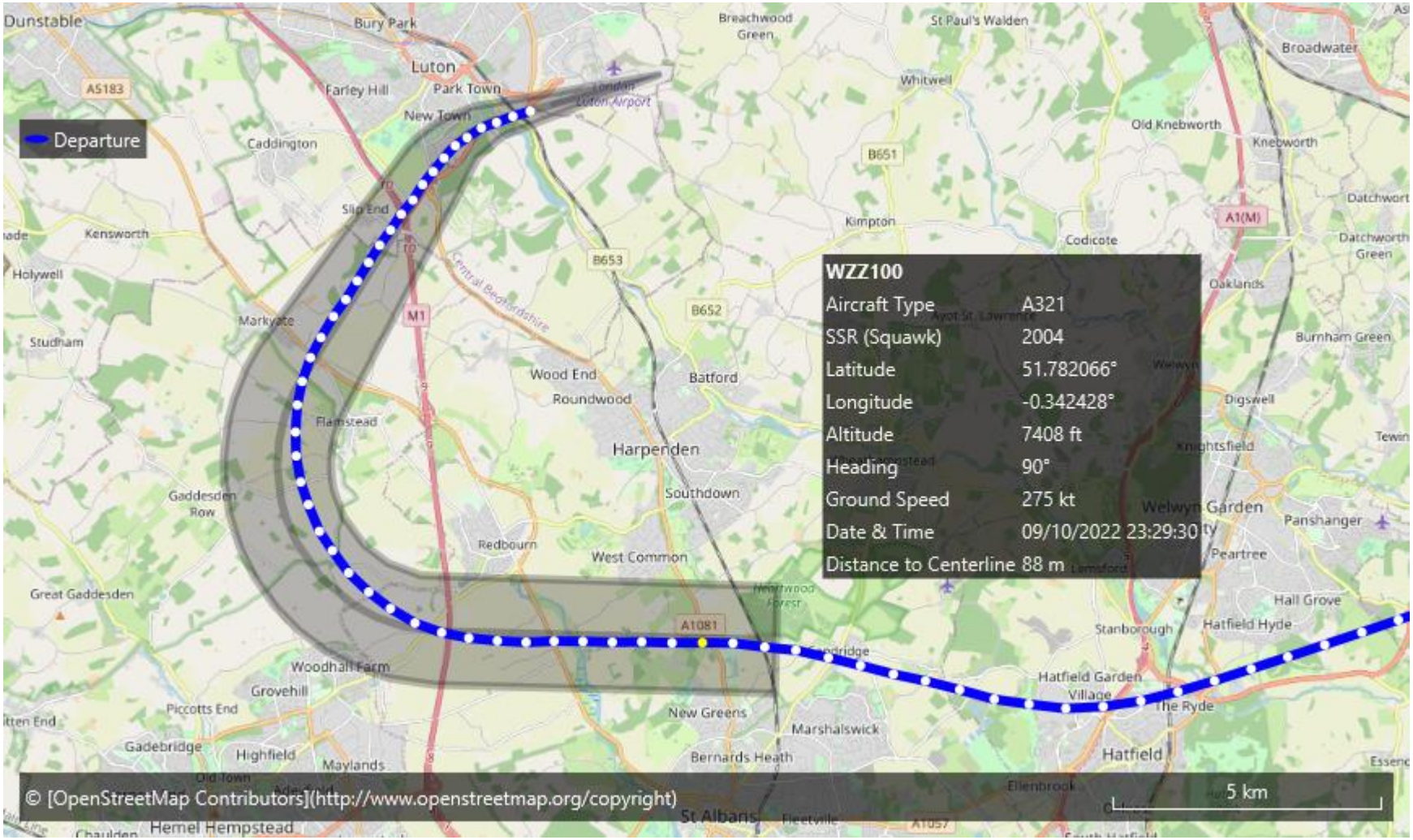
Departure at 23:18hrs on 9th October, this aircraft was scheduled to depart at 21:40hrs but experienced delay. The aircraft flew to the south of Harpenden at an altitude of 7,100ft. The aircraft was very close to the centerline of the route and therefore followed the standard procedures.



Appendix 4

Flight Information

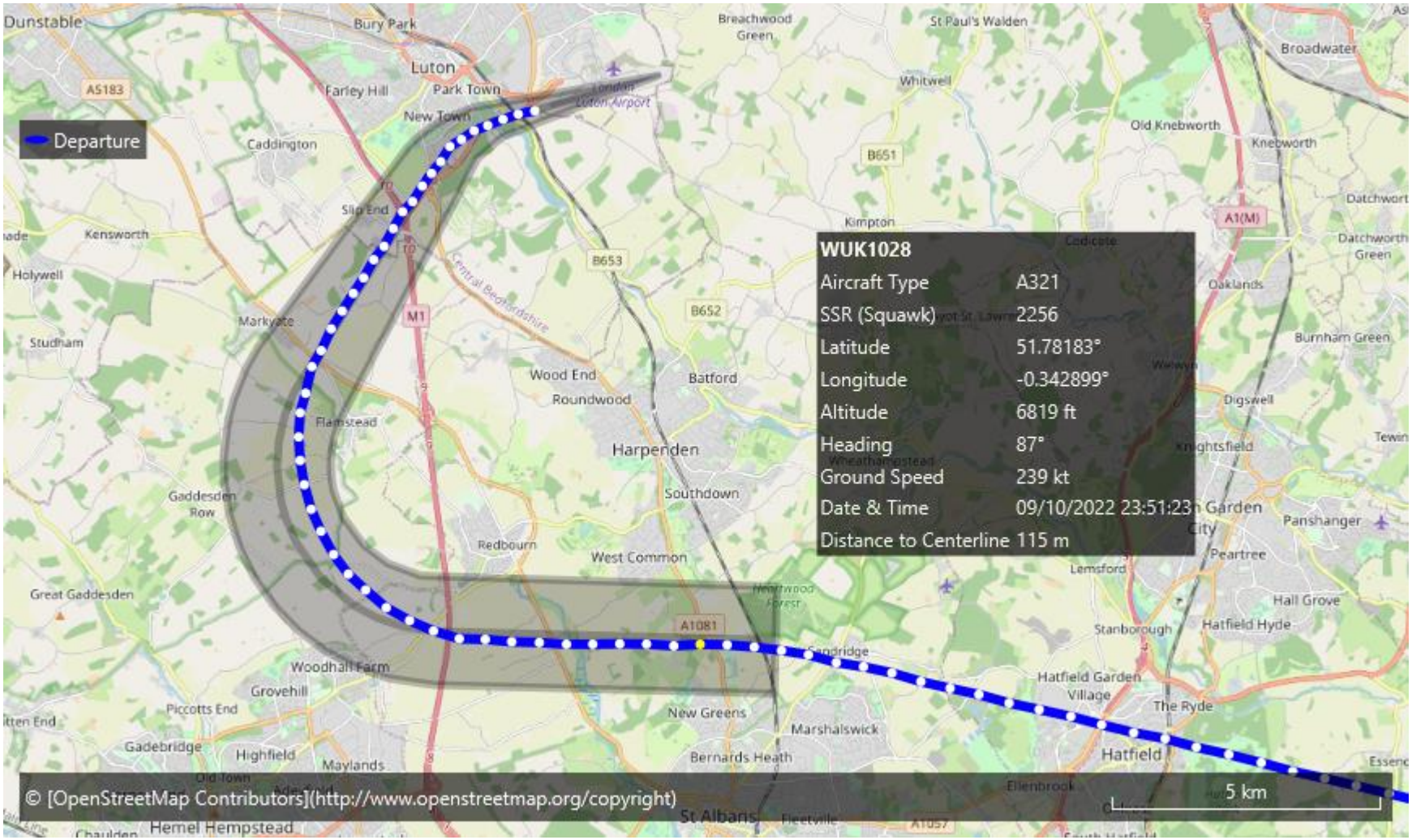
Departure at 23:26hrs on 9th October, this aircraft was scheduled to depart at 21:55hrs but experienced delay. The aircraft flew to the south of Harpenden at an altitude of 7,400ft. The aircraft was very close to the centerline of the route and therefore followed the standard procedures.



Appendix 4

Flight Information

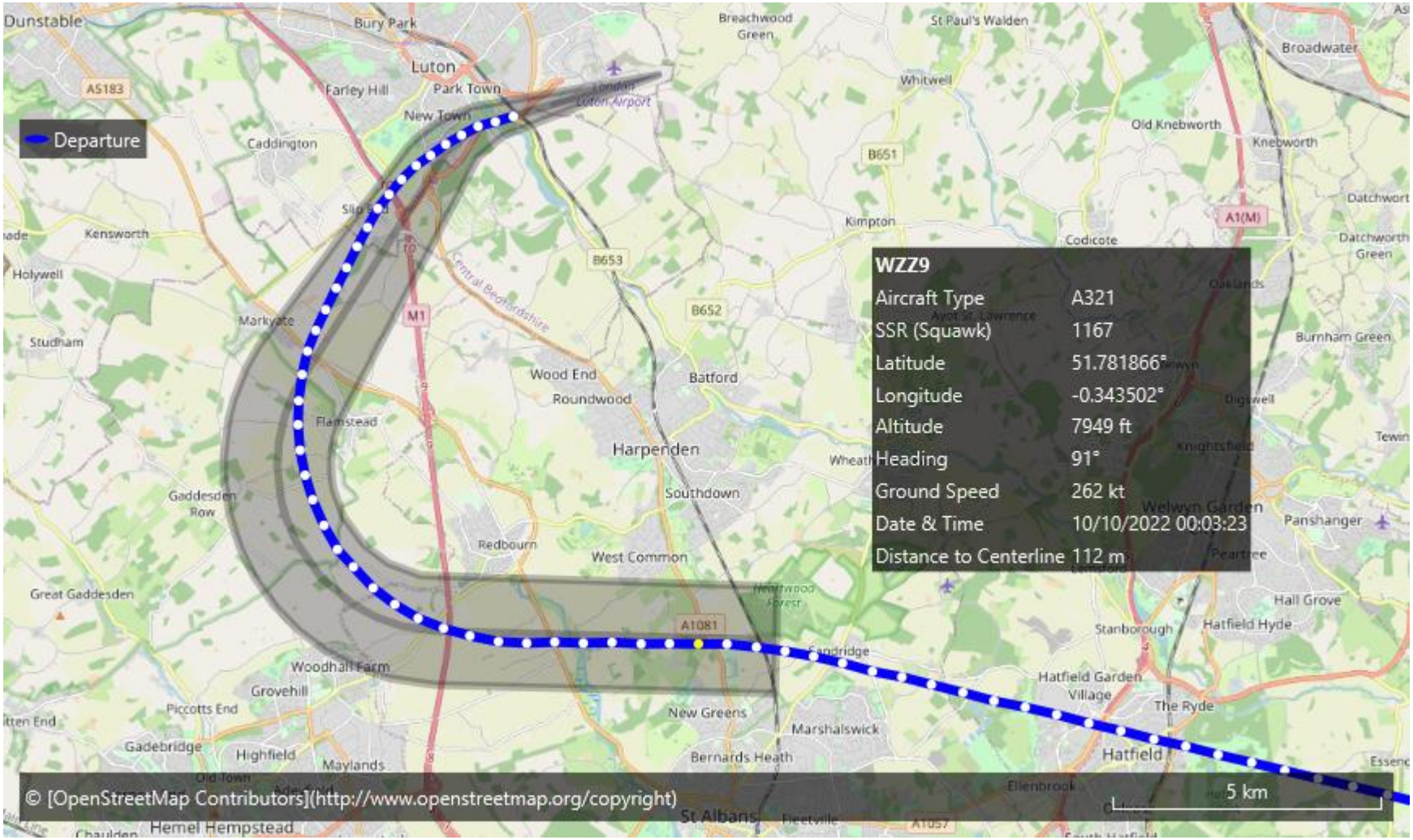
Departure at 23:48hrs on 9th October, this aircraft was scheduled to depart at 23:30hrs but experienced delay. The aircraft flew to the south of Harpenden at an altitude of 6,800ft. The aircraft was very close to the centerline of the route and therefore followed the standard procedures.



Appendix 4

Flight Information

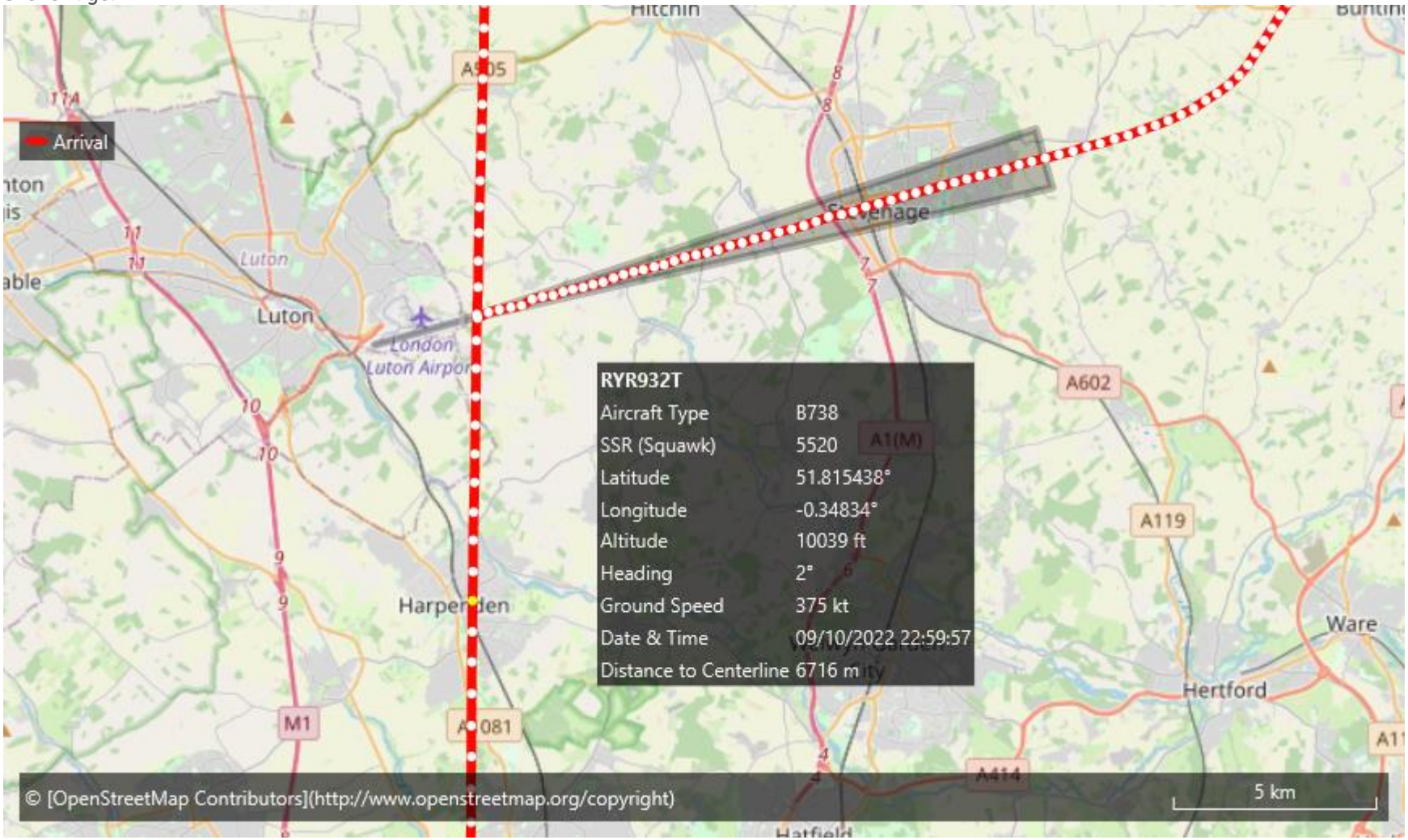
Departure at 00:00hrs on 10th October, this aircraft was scheduled to depart at 21:50hrs but experienced delay. The aircraft flew to the south of Harpenden at an altitude of 7,900ft. The aircraft was very close to the centerline of the route and therefore followed the standard procedures.



Appendix 4

Flight Information

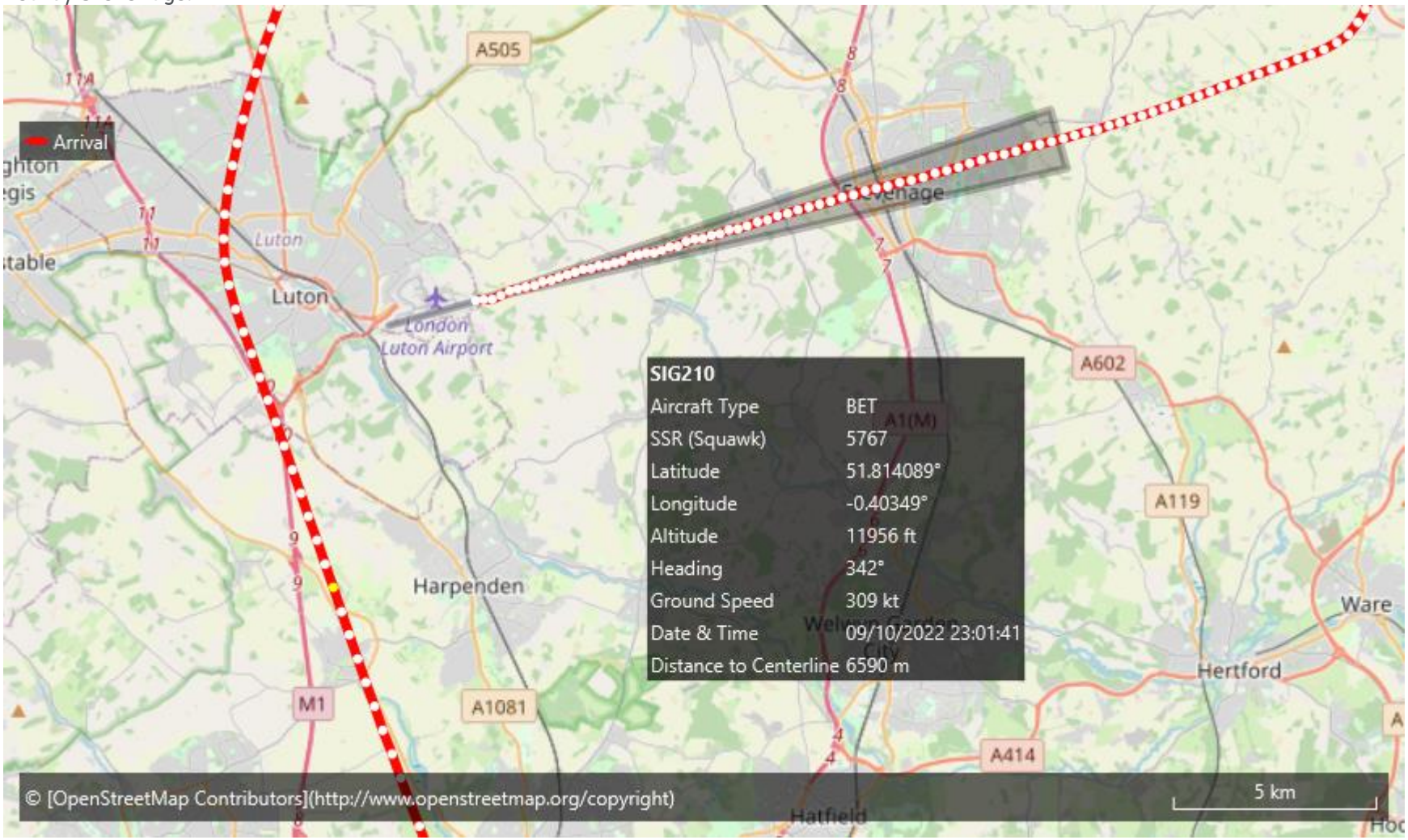
Arrival at LLA at 23:11hrs on 9th October, this aircraft directly overflew Harpenden at 22:59hrs, at approximately 10,000ft. Arriving aircraft will be directed by Air Traffic Control based on other aircraft in the airspace at the time. They must be on final approach (in line with the runway) nearby Stevenage.



Appendix 4

Flight Information

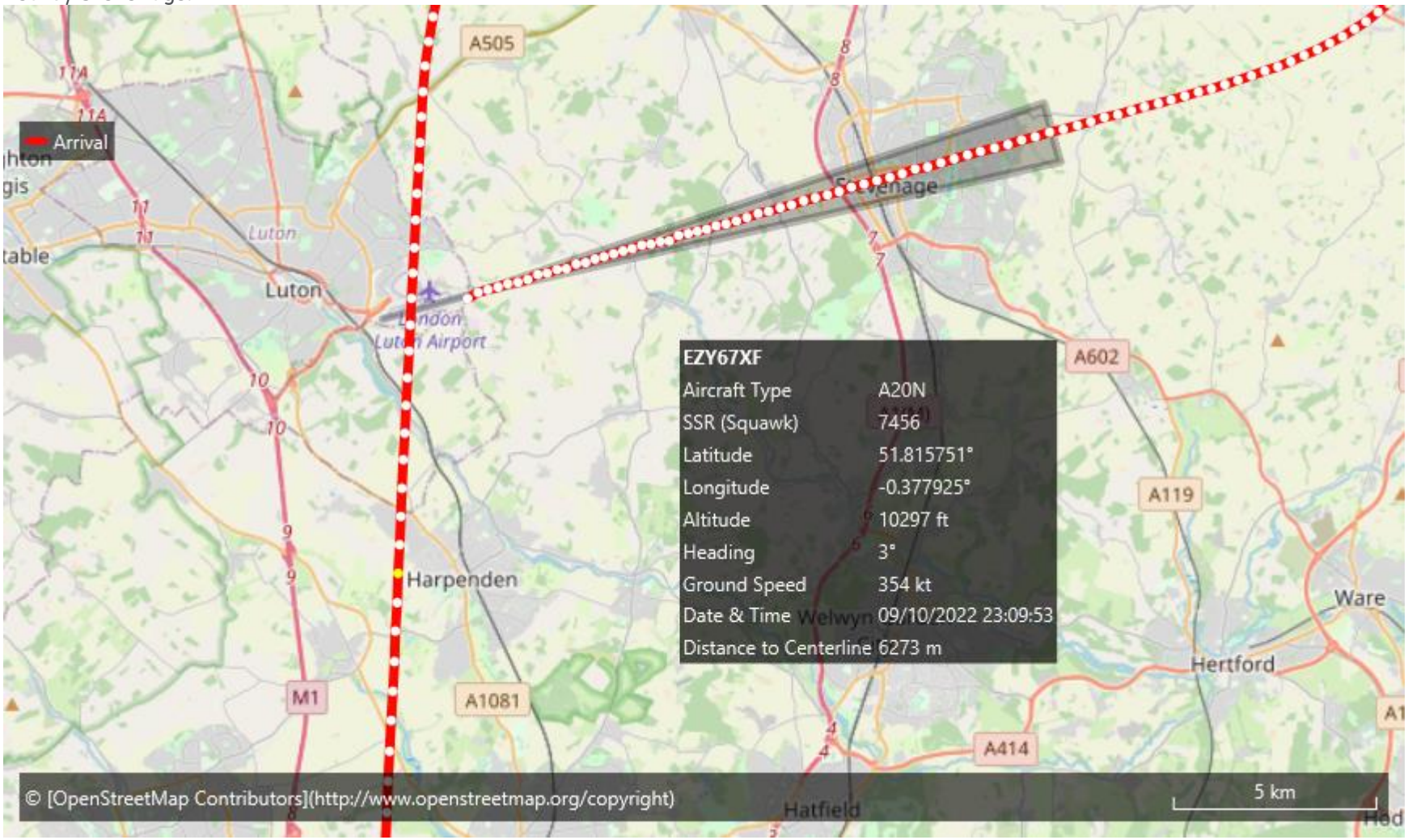
Arrival at LLA at 23:14hrs on 9th October, this aircraft flew to the west of Harpenden at 23:01hrs, at approximately 11,900ft. Arriving aircraft will be directed by Air Traffic Control based on other aircraft in the airspace at the time. They must be on final approach (in line with the runway) nearby Stevenage.



Appendix 4

Flight Information

Arrival at LLA at 23:21hrs on 9th October, this aircraft overflew the west of Harpenden at 23:09hrs, at approximately 10,200ft. Arriving aircraft will be directed by Air Traffic Control based on other aircraft in the airspace at the time. They must be on final approach (in line with the runway) nearby Stevenage.



Appendix 4

Flight Information

Arrival at LLA at 23:29hrs on 9th October, this aircraft overflew the east of Harpenden at 23:17hrs, at approximately 9,100ft. Arriving aircraft will be directed by Air Traffic Control based on other aircraft in the airspace at the time. They must be on final approach (in line with the runway) nearby Stevenage.