LADACAN comments on submissions by Deadline 8 IP ref 20040757

Contents

Glossary

19mppa application	Application 21/00031/VARCON on the LBC Planning Portal – submitted by LLAOL to LBC to further increase noise contour limits and the passenger cap
2022 inquiry	Planning Inspectorate Inquiry (ref APP/B0230/V/22/3296455) into the called-in decision by LBC to grant the 19mppa application
Airport	London Luton Airport
Airport Operator	London Luton Airport Operations Ltd, currently the concessionaire at the Airport
Applicant	Luton Rising (London Luton Airport Ltd)
Application	This application TR020001 for a Development Consent Order
CAP2091	'CAA Policy on Minimum Standards for Noise Modelling', CAP 2091, Civil Aviation Authority, 2021
CAA	Civil Aviation Authority
LBC	Luton Borough Council, ultimate owner of and Local Planning Authority for LLA
LLA	London Luton Airport
LLAOL	London Luton Airport Operations Ltd, the operator of LLA
mppa	'million passengers per annum': a measure of an airport's passenger capacity or actual passenger throughput
NMT01 etc	Fixed noise monitoring locations around the Airport, 6.5km from start of takeoff roll
noise contour	An outline on a map enclosing an area in which the 8-hour or 16-hour logarithmic average of aircraft noise for an average day in a defined 92-day summer period equals or exceeds a given value, expressed in terms of LAeq for an 8h or 16h period
Project Curium	Application 12/01400/FUL on the LBC Planning Portal – submitted by LLAOL to LBC in 2012 for development works to increase LLA capacity to 18mppa by 2028

Section 1: LADACAN's comments on the Applicant's REP8-038 submission

Comments use ID and page numbers from REP8-038, and may summarise the concern or response to provide a more manageable format.

I.D	Concerns raised	Luton Rising's Response	LADACAN further comments
Table 2.3 ID 1 p4	Greenhouse Gases: The Applicant justifies excluding Scope 3 emissions from its Greenhouse Gas Action Plan (GGAP) and the Green Controlled Growth (GCG) Limits by arguing that because these emissions are covered by the UK Emissions Trading Scheme (UK ETS) they can be addressed at a national level.	*"Scope 3 emissions have not been excluded from either the Outline Greenhouse Gas Action Plan or the Green Controlled Growth Framework; Scope 3 emissions associated with both Airport Operations and Surface Access are explicitly included within the Green Controlled Growth Framework [REP7-020], and all Scope 3 emissions are within the scope of the Outline Greenhouse Gas Action Plan [APP-081].* *Jet Zero provides a national approach to managing these emissions. While the Applicant acknowledges they have a role in facilitating the uptake of low and zero carbon aircraft, overall measures to decarbonise aviation must be implemented and managed at a national and international level. If the Applicant were to implement specific measures to address emissions from aircraft using London Luton Airport, airlines would likely move their business to another airport with less onerous regulations, resulting in no material reduction overall."*	Our argument has consistently been, and remains, that if the Applicant believes that the Jet Zero trajectory will be achieved, it should put in place Green Controlled Growth Limits which reflect that aviation emissions trajectory. The Applicant has consistently refused to accept that point, and now argues that to do so would put it at a commercial disadvantage. This demonstrates that claims of "Green Controlled Growth" are simply a sham. The Outline Greenhouse Gas Action Plan boils down to very little for which the Airport will take responsibility: a) Enabling and encouraging the use of SAF b) Encouraging more efficient aircraft c) Guidelines by 2037 on reducing LTO emissions d) Fitting FEGPs and non-diesel GPUs by 2037 These are not challenging targets for a development due to facilitate near-doubling of emissions by 2043 without any other intervention. Please see our separate comments on the Outline Greenhouse Gas Action Plan. Reference to CORSIA ignores the facts. CORSIA is set to end in 2035 and it is not known what if anything will replace it between 2036 and 2050. The Government is working with ICAO to strengthen CORSIA because it does not regard CORSIA as adequate in its current form.

I.D	Concerns raised	Luton Rising's Response	LADACAN further comments
Table 2.6 ID 8 p13	Need Case: The Applicant has not evidenced the Need for further expansion at this stage, ie prior to the completion of Project Curium and the proven delivery not just of its economic benefits but also its associated mitigations.	*"The local area has realised the benefits of growth of the airport to 18 mppa. Hence, it is appropriate for the DCO to consider the incremental benefits of growth above that level to 32 mppa. The impacts of that growth have been assessed against a base case that complied with relevant conditions relating to the original Project Curium position, namely a base case where the consented noise limits are complied with, notwithstanding that the airport attained 18 mppa earlier than expected.* *The Applicant considers that the ES for the Proposed Development demonstrates that the benefits of growth to 32 mppa outweigh the negative impacts across the wider area."*	The Applicant has consistently failed to justify pressing on with growth of the Airport in an unbalanced way – ie without first delivering the balancing mitigations (noise insulation and fleet modernization) which were due to run alongside Project Curium. The original accelerated growth ahead of mitigation was at the behest of the Applicant and does not conform to noise policy nor to the undertakings made when Project Curium was agreed, as we have evidenced in REP1-095 and REP8-075, in respect of abiding by noise conditions and insulating the homes and non-residential buildings which would be adversely impacted. Further growth before delivering on those commitments – particularly the installation of noise insulation, the fleet modernisation necessary to conform to noise conditions at 18mppa, and measures such as airspace modernisation to minimise unnecessary noise and emissions, is also not in accord with policy for balanced growth and mitigation. We remain in fundamental disagreement with the view of the Applicant that its claimed economic benefits outweigh the negative impacts, and as we and others have also indicated, there appear to be even larger financial risks if it goes ahead, than those it has already taken and which have needlessly cost hundreds of millions of pounds.

I.D	Concerns raised	Luton Rising's Response	LADACAN further comments
Table 2.6 ID 9 p14	Need Case: Air Navigation Guidance (ANG) paragraph 3.6 makes it clear that ANG requires airspace change proposals to be assessed using WebTAG, but not (as the Applicant suggests) that WebTAG is exclusively to be used for that purpose. Paragraph 2.6 of ANG confirms that WebTAG is the tool to use for airspace change, without limiting its application elsewhere. ANG Appendix C again emphasizes the generality of WebTAG.	*It should be noted that the latest WebTAG guidance in relation to aviation makes clear, at paragraph 1.1.4, that:* *"Decisions on planning applications for airport development will be considered in the normal way, including to take account of relevant material considerations which may include evidence relating to the strategic, commercial, financial and management case of a development proposal."* *The guidance is clear that there is no requirement for a WebTAG appraisal in respect of a planning application for airport development.*	Having reviewed the referenced document, we disagree with the Applicant's use of one paragraph out of context to interpret the 2023 WebTAG guidance ("the Guidance") in respect of aviation, for these reasons: Paragraph 1.1.2 is clear: *"This unit sets out the general principles for appraising aviation interventions."* Paragraph 1.1.3 is equally clear: *"The main user of this guidance is expected to be the DfT itself, but we expect this guidance to be useful to other appraisal practitioners considering the impacts from non-government aviation interventions."* Paragraph 1.1.5 establishes the best practice benchmark: *"The DfT regards this unit as best practice for the appraisal of an aviation intervention and would assess the merits of any aviation intervention against this benchmark."* Nothing in the Guidance indicates that WebTAG should not be used as part of an assessment of an aviation development proposal. On the contrary, there are many instances where it clearly endorses that approach. For example paragraph 3.3.1: *"3.3.1 Noise – TAG Unit A3 sets out the methodology for quantifying the disbenefits of noise, providing methods and values for road, rail and aviation schemes. Any appraisal of aviation schemes ought to take into account the impact of the scheme on noise, where these impacts are likely to be significant, such as for a major airport development. Aviation appraisal should use the values set out in that Unit. Where appropriate, supplementary noise metrics such as N70 (in addition to LAeq, 16h and Lnight) should be considered."* Not only does this require the appraisal, it also supports our point that metrics other than just LAeq should be taken into account.

I.D	Concerns raised	Luton Rising's Response	LADACAN further comments
Table 2.11 ID 11, p44	Scope 3 emissions	*"All Scope 3 emissions are included within the Outline Greenhouse Gas Action Plan [APP-081]."*	Please see our response above to item Table 2.3 ID 1.
Table 2.14 ID 2, p58	Noise Insulation: Going forward, unless a substantially increased rate of fully effective noise insulation installation can be secured, it is hardly able to be cited as compensation and certainly not as noise mitigation. The Applicant has not yet addressed the reality of this challenge.	*"The Applicant considers that it has fully addressed the reality of this challenge. See Applicant's response to Issue Specific Hearing 3 Action 26: Noise Insulation Delivery Programme [REP4-079] and response to WQ NO.2.15 [REP7-056]."*	Please see our comments in REP8-075 regarding noise insulation.

I.D	Matters raised	Luton Rising's Response	LADACAN further comments
Table 2.14, ID 3, p58	Noise and Vibration: As for the new generation aircraft, the A321neo still performs less well compared to the A321ceo at Luton and elsewhere, than does the A320neo compared to the A320ceo. We are engaging with the Applicant on this point and have an online meeting scheduled for 11 Jan. The modelling of A321neo noise remains an open issue and is of significance due to the increasing proportion of that type in the future fleet – see Chart 1 overleaf. It will influence our comments on REP6-063 responses to items NO.1.11 and NO.1.13 in due course.	*"The Applicant has engaged with LADACAN as noted in their submission, principally around the noise monitoring terminal inputs to the noise model validation, and is pleased to report that the data shared by LADACAN of their analyses of 2019 NMT01 and NMT02 noise monitoring data is within 0.1 to 0.3 dB of the Applicant's equivalent analyses, including for the A321neo."*	Please see our detailed comments on this and on the Applicant's REP6-063 response to NO.1.11, in Section 2 below.

Section 2: LADACAN's concerns regarding noise contour modelling

(comments apply to Applicant's REP6-063 response to NO.1.11 and to REP8-038 Table 2.14, ID 3, p58)

Use of mobile noise monitoring data

The Applicant has used mobile noise monitoring data supplied by LLAOL for part of the validation of its AEDT noise model, as reported in Tables 6.4-6.7 of REP7-013 where the SEL and LASmax noise readings derived from mobile monitors are included as well as from the fixed monitors NMT01-03.

Our knowledge and experience of LLA mobile noise monitoring data through participation in NTSC over the past 10 years indicates that it is prone to error. Occasionally this is due to equipment deficiencies (monitors drifting out of calibration and this not being noticed or rectified for days or weeks), but more often due to configuration issues affecting thresholds, which if wrong can lead to very poor sample sizes.

These thresholds define the start/end points of the transit waveform used to calculate SEL, and also the LASmax lower rejection threshold. Depending on noise levels at a given location, thresholds need to be set correctly to ensure accurate capture of SEL values (with at least a 10dB margin below the expected lower LASmax) and to avoid peaks below a given cutoff level being rejected. There are also rejections that attempt to avoid severe weather, but if not set correctly can significantly reduce usable data.

The mobile noise monitoring programme involves monitors being installed at different locations by LLA staff for a few weeks or months. After processing by LLA staff the results are published in Community Noise Reports (CNRs). Historic CNRs (including those corresponding to the collection of mobile noise monitoring data used by the Applicant) can be found at this link:
https://www.london-luton.co.uk/corporate/community/noise/community-noise-reports

Standard of modelling required

REP7-013 states in paragraph 6.7.2 on PDF page 86:
"LLAOL's noise monitors were installed in 2004, prior to the publication of ISO 20906 (Ref. 29F18). Guidance from the CAA (Ref. 30F19) notes that compliance with the ISO standard is only required for what they define as 'Category A' airports.

There is no requirement for noise monitors in Category B to be compliant with noise monitoring principles set out in ISO 20906. As the validation process follows Category B requirements from the CAA Policy on Minimum Standards for Noise Modelling, the noise data is considered to be appropriate for the validation exercise."

Whilst it is true that LLA is Category C, it is also the case that the standard of modelling required at an airport must be no less than has historically been in place, as the CAA guidance on Noise Modelling CAP2091 makes clear on page 20:

"No decrement criterion
4.10 This policy defines minimum requirements for noise modelling. Some airports may already be providing noise modelling at a higher Category than the minimum required here. We would expect these arrangements to persist and so no airport (or other stakeholder) should do less in terms of its noise modelling than it did on or before January 2020, when we first consulted on this policy, or 8 February 2021, when it comes into force."

It is of concern that the mobile noise monitoring setup, configuration and analysis does not occur under the supervision of the Airport's external noise adviser, since errors have occurred which do not meet the high standards historically applied by Bickerdike Allen to INM model validation (REP8-075 Annexes A-C).

Known sources of error

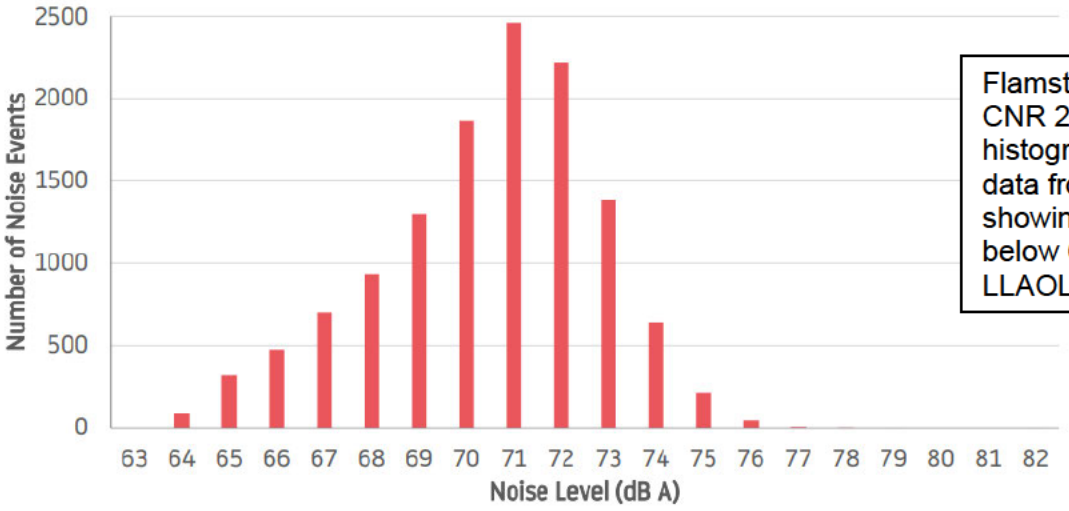
LADACAN has reported various instances of mobile noise monitoring errors to LLAOL at the NTSC, but issues are still known to occur. For example:

a) In REP6-135, p13, first slide for example, LLAOL acknowledges that the calibration of a mobile monitor had drifted; and that many noise measurements had been discarded for one monitor but not another (note: humidity is not measured at the individual monitoring locations).

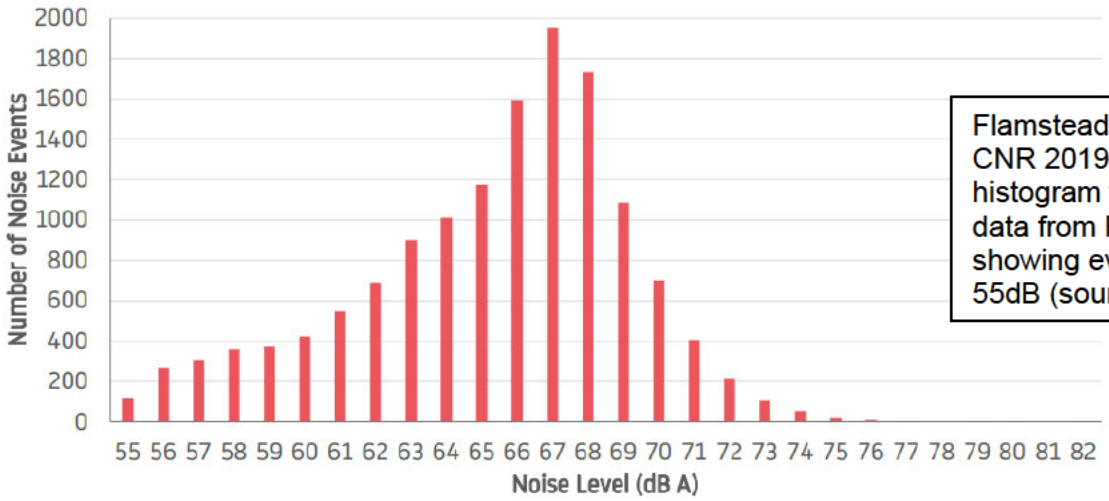
b) The 2022 Harlington CNR, shows that despite 2,922 easterly arrivals occurring during the 7-week monitoring period, 982 of which were within 1.5km of Harlington, only 33 aircraft noise samples were gathered, of which just 16 were for commercial flights, and sample sizes of 2 were used giving 95% confidence intervals of 8dB. This suggests erroneous threshold settings.

c) The 2019 CNR data for Flamstead/Markyate (used by the Applicant) shows monitors straddling the flight swathe during the same period, yet the noise histogram for the Markyate monitor shows no values below 64dB, while that of Flamstead goes to 55dB. Results of 66.7 dB for the A320neo in Markyate are too close to the 64dB cutoff to allow the 10dB margin required for reliable calculation of SEL- as the Applicant acknowledges in REP7-013 para 6.7.5. This error has been repeated elsewhere, leading to higher noise averages by exclusion of less noisy samples.

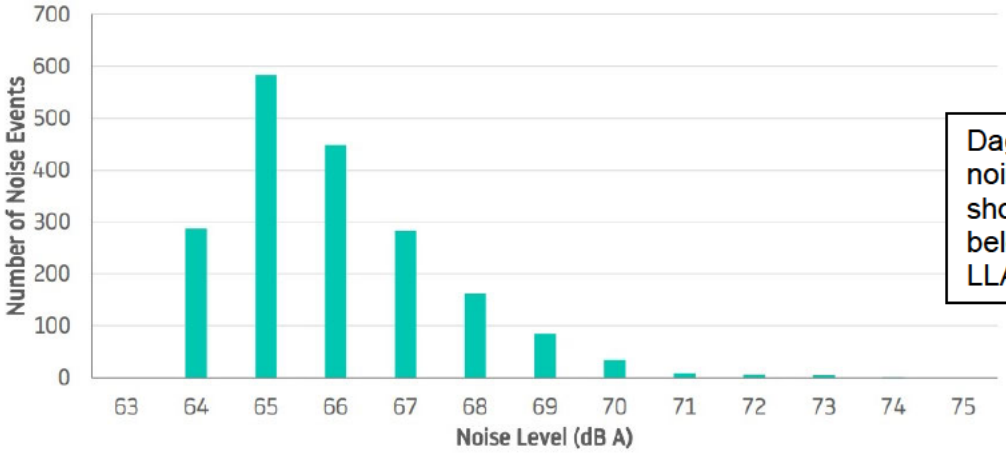
d) The 2019 CNR data for Dagnall (used by the Applicant) shows a similar issue, with an apparent cutoff below 64dB and yet aircraft LASmax averages between 65.2 and 68dB.



Flamstead/Markyate CNR 2019: noise event histogram for monitoring data from Markyate showing apparent cutoff below 64dB (source: LLAOL)



Flamstead/Markyate CNR 2019: noise event histogram for monitoring data from Flamstead showing events down to 55dB (source: LLAOL)



Dagnall CNR 2019: noise event histogram showing apparent cutoff below 64dB (source: LLAOL)

Any noise measurements based on mobile monitoring performed by LLAOL therefore need to be sense-checked before they can safely be relied on, particularly if used for noise model validation.

Sense-checking mobile monitoring data

Annex A below contains the results from the CNRs published by LLAOL corresponding to the wider area monitoring locations referenced in in Tables 6.4-6.7 of REP7-013 for the periods given in Table 6.8. The LLAOL results and the ES results were transcribed into a spreadsheet for comparison.

The Applicant has calculated 50th percentile values for SEL and LAmax from this data, whereas the LLAOL CNRs provide arithmetic averages. LADACAN transcribed the 50th percentile LASmax data from REP7-013 and subtracted the LASmax averages from the corresponding CNRs. Differences of more than 0.3dB are highlighted: red if positive, yellow if negative. The results are shown below with monitoring locations not relevant to a given operations direction omitted:

Percentile to Average LASmax comparison for 2019 Departures:

ES 50th percentile LASmax dB - LLAOL CNR average LASmax dB						
	A20N	A21N	A319	A320	A321	B738
LTN_MRK	-0.1	-0.1	0.2	0.2	0.3	0.2
LTN_FLM	0.1	0.1	0.5	0.6	0.3	0.7
LTN_BG	0.2	0.1	0.2	-0.1	-0.4	0.1
LTN_SLTN	0.2	0.2	0.2	-0.1	-0.2	0.1
LTN_PPR	0	0.5	0.1	0.1	0.2	0.2

Percentile to Average LASmax comparison for 2019 Arrivals:

ES 50th percentile LASmax dB - LLAOL CNR average LASmax dB						
	A20N	A21N	A319	A320	A321	B738
LTN_KNS	0.6	0.3	0	0.1	0.1	0.3
LTN_CAD	0	-0.1	0	-0.1	-0.1	-0.1
LTN_DGN	-0.2	-0.7	-0.5	-0.3	-0.2	-0.2
LTN_STV	-0.1	-0.4	-0.2	-0.2	-0.4	-0.1
LTN_BG	0.2	0.6	0.2	0.2	0.1	0
LTN_SLTN	0	-0.2	0.1	0.2	0.1	0.3

Whilst the majority of aircraft type / location noise values are in close agreement whether calculated as 50th percentiles or as arithmetic averages of noise measurements, those highlighted (16%) are not. Disagreement between a 50th percentile and an arithmetic average can be caused by a "tail" to the histogram of data points – either to the left or to the right. This in turn could be indicative of whether there was a greater range of less noisy or more noisy flights, or of an incorrect threshold setting.

Guidance from ISO 20906:2009(E) on 'Air-to-ground sound propagation' indicates that arithmetic averaging is appropriate, and this is the method historically used by Bickerdike Allen at LLA:

"Similar sound events may be averaged to reduce the uncertainty of the mean value. For example, the resulting expanded uncertainty of sound monitor levels averaged over 100 similar aircraft events was reduced by a factor of 10 to some 0,3 dB to 0,5 dB." (ISO20906 section B.5.2.2)

Data sourced from fixed monitors

Annual noise measurements for 2019 from the fixed monitors were disclosed by LLAOL to the 2022 Inquiry and are in the public domain in raw (uncleaned) form at this link: https://gateleyhamer-pi.com/filer/sharing/1661416387/13789/

LADACAN has analysed this data, applying the Bickerdike Allen data-cleaning guidance, and calculated the average and the 50th percentile values for SEL and LAmax values for comparison with the data provided by the Applicant in Tables 6.4-6.7 of REP7-013. We then performed a similar comparison to that described above to identify differences. Comparison between both the 50th percentiles and the averaged results showed differences of more than 0.3dB in various instances as shown below:

Departures – comparing 50th percentiles for SEL

ES 50th percentile SEL dB - LLAOL 2019 annual 50th percentile SEL dB							
	A20N	A21N	A319	A320	A321	B738	
NMT01	0.1	-0.1	0.5	-0.1	-0.1	-0.1	
NMT02	-0.2	-0.6	0	-0.3	-0.3	0	

Departures – comparing 50th percentiles to averages for SEL and LASmax

ES 50th percentile SEL dB - LLAOL 2019 annual average SEL dB						
	A20N	A21N	A319	A320	A321	B738
NMT01	0.2	0.2	0.6	0	0.1	0.1
NMT02	-0.1	-0.5	0	-0.2	-0.2	0.2

ES 50th percentile LASmax dB - LLAOL 2019 annual average LASmax dB						
	A20N	A21N	A319	A320	A321	B738
NMT01	0.4	0.1	0.2	0.1	0.2	0
NMT02	-0.2	-0.3	-0.2	-0.2	-0.2	0

Arrivals – comparing 50th percentiles to averages for SEL

ES 50th percentile SEL dB - LLAOL 2019 annual average SEL dB						
	A20N	A21N	A319	A320	A321	B738
NMT01	-0.3	-0.2	-0.4	-0.3	-0.4	-0.4

The differences were unexpected, but the Applicant's noise advisers indicated that it has only used the fixed-monitoring data for the 92-day summer period, rather than the whole year. This again is not as per the established standard set by Bickerdike Allen, which validates based on annual noise measurements.

Conclusions

Both the data which the Applicant has used to validate its noise model, and the way it has been processed for use, appears to be questionable as evidenced above for the following reasons:

a) Mobile noise monitoring data shows instances of more-than-normal disparity between arithmetic average and 50th percentile values for some datasets: the Applicant has advised LADACAN that its averages agree with the averages in the CNRs but it has nevertheless used 50th percentile values.

b) Known instances of errors in mobile noise monitoring, including during 2019, suggest that the data may be less than fully reliable for noise modelling unless properly sense-checked, and in any case only reflects sometimes short periods of time when weather effects may not be adequately normalised.

c) Only a 92-day subset of the annual fixed noise monitoring data from 2019 was used for noise model calibration, rather than using the full year data which is custom-and-practice at LLA.

d) ISO20906 describes use of arithmetic averaging to combine noise measurements for given aircraft types to reduce error, and does not mention 50th percentiles, and arithmetic averaging is custom and practice at LLA.

e) Only when these issues have been resolved and the model validated to meet current standards – including use of the most recent 2013 data in an annual revalidation update – can disputed matters such as the noise benefit to allow for the A321neo compared to the A321ceo in the LLA context be adequately resolved.

f) The Applicant has already agreed to follow established custom and practice at LLA and to revalidate the noise model annually, therefore it is appropriate to do this now bearing in mind the evidence provided here and using carefully cleaned and checked data in order to ensure the Limits for the DCO and Green Controlled Growth are as accurate as possible.

We respectfully ask the ExA for this sense-checking and revalidation to be considered necessary to give adequate confidence in the model and the contour Limits derived from it, which would be key aspects of noise control going forward should the Application be granted.

Annex A – LAmax values from LLAOL Community Noise Reports

The Community Noise Report monitoring results published by LLAOL for the periods and locations referenced in the Table 6.8 of REP7-013 are shown below, using the location codes adopted by the Applicant.

These averaged LAmax values have been transcribed into the analysis spreadsheet used to produce this submission.

LTN_KNS

Noise Results During Monitoring Period

During the monitoring period, noise results were gathered from various aircraft types, the most popular aircraft types are shown in the table below*.

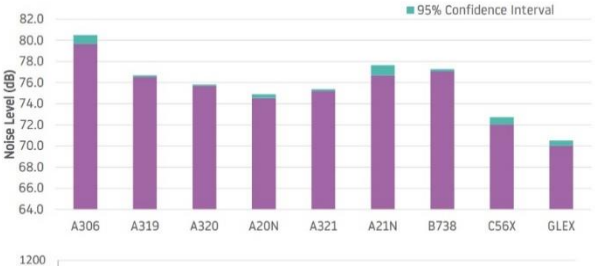
Aircraft Type	Number of movements	Average Noise (dB)
A306	42	75.9
A319	1,045	72.5
A320	2,071	72.2
A20N (A320 NEO)	248	71.4
A321	748	72.0
A21N (A321 NEO)	66	73.0
B738	803	72.5
B752	42	72.6
C56X (Cessna Citation Excel)	118	68.3
GLEX (Global Express)	192	69.0

LTN_CAD

Noise Results During Monitoring Period

During the monitoring period, noise results were gathered from various aircraft types, the most popular aircraft types are shown in the table below*.

Aircraft Type	Number of movements	Average Noise (dB)
A306	54	80.1
A319	832	76.6
A320	1,704	75.8
A20N (A320 Neo)	213	74.7
A321	601	75.3
A21N (A321 Neo)	56	77.2
B738	626	77.2
C56X (Cessna Citation)	93	72.4
GLEX (Global Express)	167	70.3

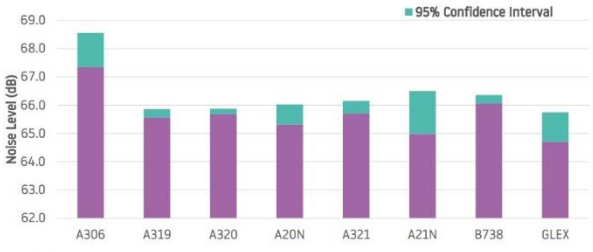


LTN_DGN

Noise Results During Monitoring Period

During the monitoring period, noise results were gathered from various aircraft types, the most popular aircraft types are shown in the table below*.

Aircraft Type	Number of movements	Average Noise (dB)
A306	46	68.0
A319	408	65.7
A320	759	65.8
A20N (A320 Neo)	54	65.7
A321	167	65.9
A21N (A321 Neo)	19	65.7
B738	337	66.2
GLEX (Global Express)	21	65.2



LTN_MRK

Markyate 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	147	70.3
A319	2,332	70.5
A320 CEO	4,600	70.7
A20N (A320 NEO)	427	66.7
A321 CEO	2,023	70.6
A21N (A321 NEO)	180	70.4
B738	1,803	71.3
B752	155	69.0
GLEX	184	68.1

LTN_FLM

Flamstead 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.

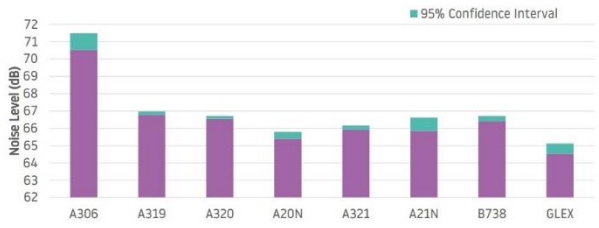
Aircraft Type	Number of movements	Average Noise (dB)
A306	127	65.7
A319	2,373	66.3
A320 CEO	4,792	65.5
A20N (A320 NEO)	609	61.1
A321 CEO	1,983	66.8
A21N (A321 NEO)	186	64.4
B734	61	68.3
B738	1,611	68.7
B752	180	64.6
GLEX	313	61.6

LTN_STV

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



LTN_BG

Arrivals - 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 arriving aircraft noise are shown on this page.

Aircraft Type	Number of movements	Average Noise (dB)
A306	114	79.1
A319	758	75.3
A320 CEO	1,377	74.3
A20N (A320 NEO)	310	72.8
A321 CEO	952	73.5
A21N (A321 NEO)	85	75.0
B738	594	77.2
C56X	101	76.9
GLEX	183	69.1

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 departing aircraft noise are shown on this page.

Aircraft Type	Number of movements	Average Noise (dB)
A306	58	80.8
A319	328	79.8
A320 CEO	581	79.2
A20N (A320 NEO)	142	74.6
A321 CEO	458	80.9
A21N (A321 NEO)	43	79.0
B738	298	83.3
GLEX	80	77.9

LTN_SLTN

Arrivals - Noise Results During Monitoring Period

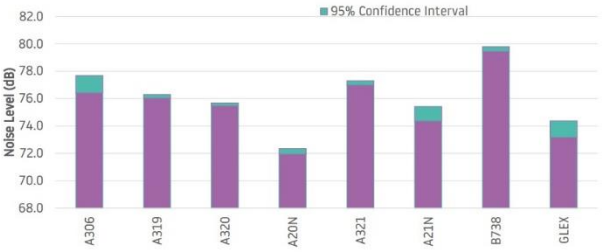
During the monitoring period, noise recording samples were gathered from the most popular aircraft types at London Luton Airport*. The summary of the results of arriving aircraft noise are shown on this page.

Aircraft Type	Number of movements	Average Noise (dB)
A306	67	77.6
A319	346	74.2
A320 CEO	612	73.3
A20N (A320 NEO)	182	71.9
A321 CEO	486	72.6
A21N (A321 NEO)	42	74.2
B738	332	76.7
GLEX	87	76.7

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 departing aircraft noise are shown on this page.

Aircraft Type	Number of movements	Average Noise (dB)
A306	110	77.0
A319	740	76.2
A320 CEO	1,342	75.6
A20N (A320 NEO)	318	72.1
A321 CEO	946	77.1
A21N (A321 NEO)	85	74.9
B738	606	79.6
GLEX	177	73.8

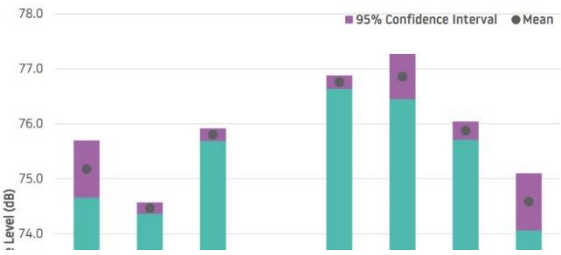


LTN_PPR

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 departing aircraft noise are shown on this page.

Aircraft Type	Number of movements	Average Noise (dB)
A306	71	75.2
A319	772	74.5
A320 CEO	1,201	75.8
A20N (A320 NEO)	254	72.6
A321 CEO	783	76.8
A21N (A321 NEO)	106	76.9
B738	545	75.9
GLEX	141	74.6



Annex B – 2019 annual noise data analysis results

Analysis of 2019 annual LLAOL noise measurements disclosed to 2022 Inquiry								
Key: 08D=runway 08, D=Depart A=Arrive; LMx/SEL(dB)=average; LMx/SEL 50P=50th percentile								
Airline	Aircraft	RwyAD	Monitor	LMx (dB)	LMx 50P	SEL (dB)	SEL 50P	Alt (ft)
	A320n	08D	NMT01	69.6	69.8	80.7	80.8	2831
	A320n	26D	NMT02	69.5	69.6	81.2	81.3	2953
	A321n	08D	NMT01	74.1	74.3	84.0	84.3	2563
	A321n	26D	NMT02	73.0	73	83.5	83.6	2663
	A319	08D	NMT01	72.7	72.8	83.7	83.8	2669
	A319	26D	NMT02	72.6	72.7	83.9	83.9	2786
	A320	08D	NMT01	73.8	73.8	84.3	84.4	2524
	A320	26D	NMT02	73.3	73.4	84.1	84.2	2603
	A321	08D	NMT01	74.8	74.9	85.7	85.9	2566
	A321	26D	NMT02	74.0	74.1	85.3	85.4	2685
	B738	08D	NMT01	74.6	74.6	86.5	86.7	3077
	B738	26D	NMT02	74.3	74.5	86.6	86.8	3267
easyJet	A320	08D	NMT01	73.2	73.3	83.8	83.9	2580
easyJet	A320	26D	NMT02	73.4	73.5	84.1	84.2	2642
easyJet	A320n	08D	NMT01	69.6	69.8	80.7	80.8	2830
easyJet	A320n	26D	NMT02	69.5	69.6	81.2	81.3	2951
Wizz Air	A320	08D	NMT01	74.6	74.6	85.0	85.1	2454
Wizz Air	A320	26D	NMT02	73.3	73.3	84.2	84.2	2552
	A320n	26A	NMT01	73.6	73.5	84.1	84	1317
	A321n	26A	NMT01	74.9	74.8	84.8	84.7	1321
	A319	26A	NMT01	75.2	75.1	85.1	85	1306
	A320	26A	NMT01	74.8	74.8	84.8	84.8	1309
	A321	26A	NMT01	74.7	74.6	84.6	84.4	1291
	B738	26A	NMT01	76.2	76.1	86.0	85.9	1309

(The highlighted values indicate a difference in performance between easyJet and Wizz A320s when on easterly departures – an issue which will affect noise performance as the fleet mix changes over time)