

**TOWN AND COUNTRY PLANNING ACT 1990, SECTION 77
TOWN AND COUNTRY PLANNING (INQUIRIES PROCEDURE) (ENGLAND) RULES 2000
APPLICATION BY LONDON LUTON AIRPORT OPERATIONS LIMITED
FOR VARIATION OF CONDITIONS 8 (PASSENGER THROUGHPUT CAP), 10 (NOISE
CONTOURS), 22 (CAR PARKING MANAGEMENT), 24 (TRAVEL PLAN) AND 28
(APPROVED PLANS AND DOCUMENTS) TO PLANNING PERMISSION
15/00950/VARCON (DATED 13 OCTOBER 2017)**

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Summary Proof of Evidence – Noise

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1. Local Noise Policy, Government Noise Policy and other guidance

1.1 Summary

- 1.1.1 Policy LLP6 of the Luton Local Plan 2011-2031¹ relates to airport expansion. Part B, criteria ii, iv, v, vi and vii are relevant to the issue of noise.
- 1.1.2 Government policy as it relates to noise from airport development is spread across several documents stretching back several years. The fundamental policy statement in the Noise Policy Statement for England² is supported by the concept of Lowest Observed Adverse Effect Level (LOAEL) and Significant Observed Adverse Effect Level (SOAEL) but leaves the assignment of numerical values to LOAEL and SOAEL to be determined outside the policy statement itself. Some statements of numerical values and their relevance have appeared in the documents reviewed above, and it has been possible to piece together a numerical framework for the purpose of applying Government Noise Policy.
- 1.1.3 For LOAEL, the statement in the Air Navigation Guidance 2017³ provides a reasonable basis for setting LOAEL at 51 dB LAeq 16h and 45 dB LAeq 8h for the day and nighttime respectively. The Aviation Policy Framework's (APF)⁴ reference to 57 dB LAeq 16h cannot be interpreted as SOAEL since Government Policy is to avoid SOAEL, and there is no government policy to avoid exposure to 57 dB LAeq 16h. It has been established, however, that the government regards mitigation at the receptor as a way of avoiding SOAEL. The ES selects 55 dB LAeq 6h for night-time SOAEL based on the Night Noise Guidelines for Europe Interim Target.
- 1.1.4 It follows that at LOAEL and above, noise should be mitigated and minimised and at or above SOAEL, avoidance can be achieved by the provision of mitigation in the form of sound insulation at the receptor.

¹ CD09.07

² CD13.06

³ CD8.02

⁴ CD8.05

2. The Application Proposals

2.1 Introduction

- 2.1.1 The proposals only relate to changes in operations and do not involve any changes to physical features of the airport. The only indirect physical changes would be a consequence of the scheme for the provision of sound insulation of dwellings.

2.2 Operational features of the proposals that affect noise

- 2.2.1 The proposals involve an increase in the permitted number of passengers per annum, and a temporary increase in the allowable noise contour area, followed by a reduction in the allowable noise contour area. The potential changes that would result from the proposals would be to aircraft fleet mix and numbers. In particular, the increase in the limit on passenger numbers facilitates the introduction of the quieter “neo” and “max” versions of the A300 series and Boeing 737 series of aircraft by airlines. These have a large seating capacity without breaching the limit on passenger numbers, or having to remove seats from the aircraft (or leave seats unfilled).

2.3 Effects of Re-fleeting

- 2.3.1 For more than ten years the aviation industry has been expecting the introduction of aircraft powered by a new design of engines, principally the CFM Leap engine and the Pratt & Whitney PW1000G, which among other things were expected to result in lower noise levels.
- 2.3.2 The promised extent of lower noise levels associated with the new aircraft types was not completely fulfilled.
- 2.3.3 Consequently, when forecast noise contours prepared in the last decade are compared with actual contours, the actual contours are larger because of a combination of a smaller amount of re-fleeting than foreseen and a smaller actual noise reduction from those new aircraft that did enter service.

2.4 The principles of the proposed mitigation

Noise Insulation and Compensation

- 2.4.1 The Airport’s proposed noise insulation scheme for these proposals is compliant with and exceeds Government requirements as set out within the APF. It represents an improvement on the noise insulation scheme

which is currently provided for in the terms of the current s106 legal agreement.

- 2.4.2 At the time of writing, and under the existing mitigation scheme, LLAOL has completed noise insulation of 142 properties. A further 125 have accepted the offer of noise insulation. This total of 267 acceptances is 30% of the number of offers made.

3. Assessment Methodology

3.1 Introduction

- 3.1.1 The noise assessment for these proposals is contained within ESA3 and ESA4. ESA3 revised the noise chapter of ESA2. ESA4 was prepared to update ESA3 as a result of the time which had passed since its preparation. These documents consider the effect of the application proposals firstly in terms of the change in noise index values resulting from comparing scenarios with and without the proposals, and secondly by evaluating the change in the number of dwellings and non-residential properties that lie within relevant contours of absolute noise index levels, particularly the contours of SOAEL with regard to dwellings.
- 3.1.2 The Appendices to the 2022 ES Addendum (ESA4)⁵ presents N65 contours for a range of scenarios. The contours change little as a result of the proposals.

⁵ CD1.17

4. Assessment of Effects

4.1 Significance

Day

- 4.1.1 The assessment concludes that the effect of the proposed scheme during day time in 2023, the year when the change in $L_{Aeq, 16h}$ is greatest, is less than 1 dB and would not be significant.

Night

- 4.1.2 The assessment concludes that the effect of the proposed scheme during night time in 2023, the year when the change in $L_{Aeq, 8h}$ is greatest, is less than 1 dB and would not be significant.

4.2 Exceedance of SOAEL

Day

- 4.2.1 Table 6.20 of ESA3 shows that 105 new properties would fall within SOAEL of 63 dB $L_{Aeq, 0700-2300}$ in 2023, the year when the change in $L_{Aeq, 16h}$ is greatest. As explained above the perceived change in noise for residents of those properties is marginal and would not be noticeable.

Night

- 4.2.2 Table 6.20 of ESA3 shows that 322 new properties would fall within SOAEL of 55 dB $L_{Aeq, 2300-0700}$ in 2023, the year when the change in $L_{Aeq, 16h}$ is greatest. This figure includes the 105 new properties that fall within the daytime SOAEL. Again, the perceived change in noise for residents of those properties is marginal and would not be noticeable.
- 4.2.3 There is no equivalent table to 6.5 and 6.6 for the year 2031 in the body of ESA4, but table 8E2.2 in Volume 3 Figures and Appendices of ESA4 shows that in 2031 the number of dwellings within the daytime SOAEL, at 282, is fewer than the figure of 359 for 2028 with the existing Condition 10 noise limit. For night time there is a total of 968 dwellings within SOAEL compared with 1057 for 2028 with the existing Condition 10 noise limit.
- 4.2.4 It can be seen by comparing figures 6.1 and 6.17 that the daytime contours for 2031 19mppa are smaller than the contour for 2023 with the existing Condition 10 limit. Likewise, by comparing figures 6.2 and 6.18 it can be seen that the night-time contours for 2031 19mppa are smaller than the contour for 2023 with the existing Condition 10 limit.

4.3 Non-residential receptors

- 4.3.1 Section 6.6 and table 6.16 of ESA4 shows that for non-residential receptors increases in noise are all less than 1dB and not significant.

4.4 Health effects of the proposed scheme due to noise.

- 4.4.1 The direct effects of noise on health have been the subject of a number of scientific studies. Many of these were reviewed by the Guideline Development Group (GDG) in the production of the Environmental Noise Guidelines for the European Region, ENG, (a process in which I was a member of the External Review Group). The UK Government has not implemented the recommendation of the ENG.
- 4.4.2 However, research into the health effects of noise generally considers long-term permanent noise exposure. The health effects of increased aircraft noise exposure which endures for only a limited period have not been studied.
- 4.4.3 The WHO ENG use L_{den} as their metric, a composite of the annual L_{Aeq} indices for day, evening and night, in which the evening L_{Aeq} is enhanced by 5dB and the night L_{Aeq} is enhanced by 10dB. In the case of London Luton Airport L_{den} is approximately equal to L_{Aeq16h} plus 2dB.
- 4.4.4 The GDG rated many of the studies they considered as of low or very low quality. For Incidence of Ischaemic Heart Disease (IHD) they reported a relative risk (RR) of 1.09 with confidence limits of 1.04-1.15 per 10 dB increase above 47 dB L_{den} approximately equivalent to the 45 dB $L_{Aeq 16h}$ contour at London Luton Airport. This means that in a population with long term exposure to aircraft noise at 57 L_{den} , there is a 4% to 15% greater risk of IHD than in a population identical in all respects except that their noise exposure is 47 dB L_{den} . To get the approximate percentages for a 1 dB increase these percentages can be divided by 10, meaning that the risk of hypertension in a population with long-term exposure to 48 dB L_{den} is approximately 0.4% to 1.5% greater than the otherwise equivalent population exposed to no more than 47 dB L_{den} .
- 4.4.5 For incidence of hypertension the RR was 1.00 with confidence limits of 0.77-1.30 per 10 dB increase. This means that different studies may show a reduction in hypertension or an increase in hypertension. For cognitive impairment (reading and oral comprehension) the finding was a 2-month delay per 5 dB increase.
- 4.4.6 The RR values all relate to long-term noise exposure, whereas the noise increases around London Luton Airport associated with the scheme proposals will last only for a limited period.
- 4.4.7 Furthermore, in the social surveys on which the studies reported are based, no account is taken of the presence of noise insulation. It is

therefore not known whether the health effects of aircraft noise are mitigated by the installation of noise insulation. At an airport where an increase in noise is accompanied by an improvement in the noise insulation scheme, as is the case at London Luton Airport, this could explain why the confidence limits for RR of hypertension cover the possibility of a reduction in RR with a 10 dB increase in the noise index.

- 4.4.8 In the present case, no part of the population will experience a change as high as 1 dB, so taking the top of the confidence limits ranges, the RR is not greater than 1.015 for IHD and 1.03 for hypertension for a 1dB change. This means that in a population with long-term noise exposure of a certain level of noise the risk of suffering hypertension is 3% more than in an identical population with noise exposure 1dB less. The equivalent percentage for IHD is 1.5%. The cognitive reading and oral comprehension delay cannot be evaluated for less than a 1 dB change.
- 4.4.9 With regard to sleep disturbance, broadly speaking, an increase of 1dB results in an extra 1% of the population being Highly Sleep Disturbed. Population figures down to 40 L_{night} are not available, but within the 45 dB $L_{Aeq\ 2300-0700}$ contour there are about 25000 dwellings, and the total within the 40 dB $L_{Aeq\ (2300-0700)}$ contour may be approximately double that figure, which leads to the conclusion that residents in a further 500 dwellings would be highly sleep disturbed in 2023 as a result of the scheme proposals. For 2031, there are dwellings in both the -0.9-0.0 and 0.0-0.9 columns, with a net fall in the number within the 45 $L_{Aeq\ (2300-07)}$ contours of approximately 3800, i.e. about 7,600 within the 40 dB $L_{Aeq\ (2300-0700)}$ contour, taking residents in a net number of dwellings of approximately 76 out of the total highly sleep disturbed.
- 4.4.10 These population totals do not have much meaning, because, for any particular resident of the dwellings concerned they will not notice a negligible difference in the loudness or frequency of occurrence of aircraft noise events. The change in L_{Aeq} level is less than 1dB and therefore negligible.
- 4.4.11 With regard to annoyance, broadly speaking, a rise of 1 dB results in a little over a 1% increase in the population highly annoyed. There are approximately 16000 dwellings with noise exposure above 51 dB $L_{Aeq\ 0700-2300}$ likely to experience a 1 dB increase in 2023 due to the scheme proposals, so that residents in about 160 additional dwellings are likely to be highly annoyed.
- 4.4.12 By 2031, however, the greater part of the dwellings experiencing a 1dB noise change experience a fall in noise level, a net total of approximately 8500 so that by 2032 residents in about 85 dwellings will be taken out of the total highly annoyed category.
- 4.4.13 Again, these population totals do not have much meaning, because, for any particular resident of the dwellings concerned they will not notice a

difference in the loudness or frequency of occurrence of aircraft noise events when the change in L_{Aeq} level is less than 1dB.

5. Proposed Mitigation

5.1 Noise insulation mitigation

- 5.1.1 322 additional properties would be exposed to noise above night-time SOAEL and of these 105 new properties would be exposed to noise above daytime SOAEL in the 2023 Proposed Scheme scenario.
- 5.1.2 There will be an offer of noise insulation for the 322 additional dwellings that would be predicted to experience noise levels above SOAEL as a result of the Proposed Scheme.
- 5.1.3 Under the new scheme a fund of £4,500 (index linked) per property is proposed with an uncapped annual fund. In relation to daytime SOAEL, windows to any habitable room are included, whilst for properties that fall within the night-time SOAEL only, replacement bedroom windows would be provided. The Applicant intends to allocate £8.5M to the noise insulation.

6. Compliance with policy requirements

6.1 The Luton Local Plan

- 6.1.1 The extent to which the application proposals comply with airport noise related aspects of policies in the Luton Local Plan is as follows:

iv. they fully assess the impacts of any increase in Air Transport Movements on surrounding occupiers and/or local environment (in terms of noise, disturbance, air quality and climate change impacts), and identify appropriate forms of mitigation in the event significant adverse effects are identified;

- 6.1.2 The proposals comply. ESA4 contains a full assessment of the impacts and identifies appropriate forms of mitigation.

v. achieve further noise reduction or no material increase in day or night time noise or otherwise cause excessive noise including ground noise at any time of the day or night and in accordance with the airport's most recent Airport Noise Action Plan;

- 6.1.3 The proposals comply. Further noise reduction is achieved after the end of 2027. Meanwhile the increase in noise is not material. The overall effect of the proposals is a reduction in noise from 2031.

vi. include an effective noise control, monitoring and management scheme that ensures that current and future operations at the airport are fully in accordance with the policies of this Plan and any planning permission which has been granted;

- 6.1.4 The proposals comply in that the existing noise control, monitoring and management scheme will remain in place

vii. include proposals that will, over time, result in a significant diminution and betterment of the effects of aircraft operations on the amenity of local residents, occupiers and users of sensitive premises in the area, through measures to be taken to secure fleet modernisation or otherwise;

- 6.1.5 The proposals comply. Temporary increases in the area limit for the 57 dB LAeq (0700-2300) from 19.4 sq km to 21.6 sq km and 48 dB LAeq (2300-0700) from 37.2 sq km to 42.9 sq km are followed by decreases after 2027 and post 2030 to 15.1 sq km and 31.6 sq km respectively. There is significant betterment in the noise insulation scheme, so that the temporary increase in contour areas triggers an improved noise insulation scheme.

6.2 National Noise Policy

- 6.2.1 The requirements of the NPSE (which underpin wider aviation noise policy set out in section 2 above), to mitigate and minimise noise above LOAEL, and to avoid noise above SOAEL are met through the mitigation measures set out in sections 6 and 9 above.

7. Conclusions

- 7.1.1 The application seeks permission for an increase in the permitted number of annual passenger numbers from 18mppa to 19mppa, and temporary increases in the area limit for the 57 dB L_{Aeq} (0700-2300) from 19.4 sq km to 21.6 sq km and 48 dB L_{Aeq} (2300-0700) from 37.2 sq km to 42.9 sq km. These are followed by decreases post 2030 to 15.1 sq km and 31.6 sq km respectively. The application involves no new infrastructure nor any other physical development.
- 7.1.2 The fundamental statement of Government Policy on noise is the Noise Policy Statement for England which includes the concept of Lowest Observed Adverse Effect Level (LOAEL) and Significant Observed Adverse Effect Level (SOAEL).
- 7.1.3 For LOAEL, the statement in the Air Navigation Guidance 2017 provides a reasonable basis for setting LOAEL at 51 dB L_{Aeq} 16h and 45 dB L_{Aeq} 6h. SOAEL of 63 dB L_{Aeq} 16h is aligned with recommended noise insulation thresholds. 55 dB L_{Aeq} 8h for night-time SOAEL is based on the Night Noise Guidelines for Europe Interim Target.
- 7.1.4 It follows that at LOAEL and above, noise should be mitigated and minimised and at or above SOAEL, avoidance can be achieved by the provision of mitigation in the form of sound insulation at the receptor.
- 7.1.5 LLAOL's proposed noise insulation scheme for these proposals is compliant with and exceeds Government requirements as set out within the APF.
- 7.1.6 It is proposed that the eligibility criteria for noise insulation will be based on the worst year, in ESA4 predicted as 2023, and fixed for a period of six years, i.e. any properties that fell within the 55dB L_{Aeq} 8hr or 63dB L_{Aeq} 16hr contour in the worst year would be entitled to noise insulation for a period of six years after that date, despite the fact that they may no longer be within the SOAEL contour as it decreases up to 2028 and 2031.
- 7.1.7 The ES considers the effect of the application proposals firstly in terms of the change in noise index values resulting from comparing scenarios with and without the proposals, and secondly by evaluating the change in the number of dwellings and non-residential properties that lie within relevant contours of absolute noise index levels, particularly the contours of SOAEL with regard to dwellings
- 7.1.8 The assessment concludes that the effect of the proposed scheme during both the day time and the night time in 2023, the year when the change in L_{Aeq} , 16h is greatest, is less than 1 dB and would not be significant.

- 7.1.9 ESA4 shows that 105 new properties would fall within the day time SOAEL in 2023, the year when the change in $L_{Aeq, 16h}$ is greatest. The perceived change in noise for residents of those properties is not noticeable
- 7.1.10 A total of 322 new properties would fall within the night time SOAEL in 2023. This figure includes the 105 new properties that fall within the daytime SOAEL. Again, the perceived change in noise for residents of those properties is not noticeable.
- 7.1.11 The daytime noise contours for 2031 19mppa are smaller than the contour for 2023 with the existing Condition 10 limit.
- 7.1.12 The proposals comply with Government and local policy including the Luton Local Plan.
- 7.1.13 In summary, implementation of the proposals which are the subject of the planning application would have a noise effect which varies according to the year of assessment. In 2023 there is predicted to be an increase in noise with an associated increase in noise contour area, but the magnitude of the increase is not significant. There is a slight increase in the number of dwellings coming within the SOAEL contour. However, there will be a considerable enhancement of the noise insulation scheme. After 2023 there is predicted to be a fall in noise level and associated noise contour area, and the revised planning condition 10 requires a smaller daytime noise contour in the future than in the current planning condition.
- 7.1.14 The overall effect of the proposals is therefore to reduce the noise impact of the operation of the airport and to improve mitigation for surrounding residents.