

LONDON CITY AIRPORT PLANNING APPLICATION

22/03045/VAR | Section 73 application to vary Conditions 2 (Approved documents) 8 (Aircraft Maintenance) 12 (Aircraft Stand Location) 17 (Aircraft Take-off and Land Times) 23, 25, 26 (Daily limits) 35 (Temporary Facilities) 42 (Terminal Opening Hours) 43 (Passengers) and 50 (Ground Running) to allow up to 9 million passengers per annum (currently limited to 6.5 million) arrivals and departures on Saturdays until 18.30 with up to 12 arrivals for a further hour during British Summer Time (currently allowed until 12.30), modifications to daily, weekend and other limits on flights and minor design changes, including to the forecourt and airfield layout attached to planning permission 13/01228/FUL allowed on appeal APP/G5750/W/15/3035673 dated 26th July 2016 which granted planning permission for; "Works to demolish existing buildings and structures and provide additional infrastructure and passenger facilities at London City Airport" This application is accompanied by an Environmental Statement for the purposes of Environmental Impact Assessment under The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) | London City Airport Hartmann Road Silvertown London E16 2PX

REVIEW OF NOISE AND VIBRATION ASPECTS OF THE APPLICATION AND THE ENVIRONMENTAL STATEMENT

This document provides the results of a review of the above planning application with regard to the noise implications of potential implementation of the application. Despite the title of Chapter 8, vibration has been scoped out. The justification for this is considered below.

The application is accompanied by an Environmental Statement including Chapter 8 "Noise and Vibration" and Chapter 12 "Public Health and Wellbeing". Noise is assessed under both headings and the relevant conclusions differ in emphasis.

This review firstly summarises the aspects of the proposals which affect noise. Secondly it considers the appropriateness of the methodology used to assess those aspects, including the accuracy of the assumptions. Thirdly it analyses the conclusions reached by applying that methodology. Fourthly any gaps in the assessment are identified. Fifthly technical issues raised in responses to consultation not already included are considered. Finally a summary of the matters which need to be taken into account in considering the application is provided.

Aspects of the proposals which affect noise and vibration

The consequences of implementing the application which are within the scope of this review are of a direct and an indirect nature, as follows:

NOISE

Direct effects

The direct effects are:

- 1) Aircraft movements, maintenance and repair activities on Saturday afternoons. Number of movements increased from 100 to 230 per Saturday, and from 280 to 400 on any consecutive Saturday and Sunday;
- 2) The maximum number of Actual Aircraft Movements between 0630 and 0659 hours on Mondays to Saturdays (excluding Bank Holidays and Public Holidays when the Airport shall be

closed for the use or operation of aircraft between these times) increased from 6 to 9. Maximum Permitted Actual Aircraft Movement limit between 0630 hours and 0645 hours on Mondays to Saturdays increased from 2 to 4.

- 3) Revision to locations of aircraft stands.
- 4) Surface transport consequences of passenger throughput of the Airport increased from 6.5 to 9 million passengers in any twelve month period.

Indirect effects are

- 5) Air and ground noise resulting from changes in aircraft types and annual movement numbers within existing limits following increase in passenger throughput from 6.5 to 9 million passengers in any twelve month period.

The indirect nature of this effect is due to the fact that the forecast mix of future aircraft movements would not be a direct consequence of permitting the application. It is largely the effect of potential growth and changes in fleet mix resulting from the airport suiting the airlines better. There is nothing to prevent or restrict the forecast scenarios coming about, until 6.5mppa is reached, without implementing this application. There being no change in movement limits or noise limits, it is a matter of timing, with 6.5mppa being reached in an earlier year with the permission than without. In theory, however, 6.5mppa could be reached in 2026 without this permission. The constraint in the Do Minimum case is not a direct one until the passenger limit is reached.

Vibration

Paragraph 8.3.7 of Volume 1 States “8.3.7 An assessment of operational vibration is scoped out of the assessment on the basis that there are not considered to be any likely significant effects.” Paragraph 8.3.7 of Volume 1 States “8.3.8 An assessment of vibration from construction works is also scoped out of the assessment on the basis that there are not considered to be any likely significant effects. The 2015 UES considered vibration from construction and found no significant effects. In addition, the construction element of CADP1 most likely to result in vibration effects was piling in the dock, which is now complete.”

Vibration due to operation of aircraft

It is not unknown for residents near airports to report vibration due to the movement of aircraft. This effect was considered by Heathrow Airport, and studies were carried out and referred to in evidence at the Public Inquiry into “Enabling works to allow implementation of full runway alternation during easterly operations at Heathrow Airport” (the Cranford Inquiry). The studies found an effect of vibration induced by low frequency noise from aircraft engines limited to lightweight structures close to a runway. Heathrow’s mitigation proposals included the provision of financial assistance towards addressing the impact of noise-induced vibration within lightweight structures within Longford. The aircraft concerned were of a larger type than those which can operate at LCY and there are no reports of similar effects experienced by residents near the LCY runway. It is therefore appropriate for vibration to have been scoped out of the operational noise and vibration assessment in this application.

Vibration due to construction works

The justification for scoping vibration out of the construction noise and vibration study is that “the construction element of CADP1 most likely to result in vibration effects was piling in the dock, which is now complete.” No piling equipment is listed in the plant assumptions in Appendix 8.6. The only item of plant which could cause vibration effects outside the site boundaries is “vibratory roller”. The locations where the roller(s) would operate are not indicated and it would be desirable to present the results of a check that vibration effects at sensitive receptors would not be significant.

Methodology used to assess noise effects

Separation of effects into “noise” and “health”.

The ES considers noise in two chapters, Chapter 8 Noise and Vibration and Chapter 12 “Health and well-being”. Noise effects on health and well-being are not separate from other effects that potentially arise in the present context. While Chapter 12 cross-refers to Chapter 8 from which it draws information, there is no cross reference to Chapter 12 in Chapter 8.

Noise methodology

Noise indices

The numerical quantification of aircraft noise in general is well established, and the methodology used in the ES is conventional with regard to noise occurring within the conventionally adopted time periods, particularly the noise contour period of mid-June to mid-September separately assessed for night and day.

The unusual feature of this application is that there are potential effects that are very specific to local circumstances, namely the increase on early morning aircraft movements and the loss of respite on Saturday afternoons.

Noise indices of any kind are only of use if they are linked to the results of noise and social surveys or incidence of health effects which permit the establishment of a correlation between numerical noise index values (and changes in those values) and observed effects in a population. There are very limited data in the literature to enable noise indices, and changes in their values, to be used to assess the significance of the effect of increase the number of aircraft movements in the half hour between 0630 and 0700. There is only information relating to the full night period 2300-0700. There is some information about the role played by respite periods for populations around airports, particularly in the case of airports with more than one runway where runway mode segregation or alternation is possible.

The ES in this case departs from established convention by including some night movements in the daytime noise contours as explained in 8.3.70

8.3.70 For daytime air noise, the standard 16 hour period assessed in the UK is 07:00-23:00. At LCY daytime noise contours have generally been produced based on the airport’s operational hours 06:30-22:30, thus including all flights that occur at the airport. This approach has therefore also been used for this assessment.

The 8 hour night period contours have been based on the standard UK night period 23:00-07:00, and thus include some movements that are also modelled in the daytime contours (i.e. those between 06:30-07:00)

A further unconventional approach has been introduced specifically for the issue of Saturday afternoons:

8.3.74 In addition to these primary metrics, due to the proposed changes in Saturday operational hours, a specific assessment of weekend noise has been undertaken. Air noise predictions have been undertaken in terms of the standard daytime $L_{Aeq,16h}$ metric, but the predictions are based on only the aircraft movements at the weekend. This is not a standard assessment metric but is intended to show how noise at the weekend could change over time with the proposals.

This has not been done before, and the method of drawing conclusions from the outcome is not an established procedure with the result that the conclusions need to be regarded with caution.

A key feature of the noise assessment is that a change in outdoor noise level in the range 0-1.9 dB $L_{Aeq,16h}$ or $L_{Aeq,8h}$ is negligible. Chapter 8 8.3.98 points out that “A semantic scale of this type, based on the IEMA noise impact guidelines, has been widely accepted in the assessment of other UK airport development projects such as the recent Bristol Airport application and the Luton Airport Development Consent Order (DCO) application.” It does not note that for the 2022 Luton Section 73 application called-in inquiry the ES regards a 1 dB increase as significant where the noise exposure was above SOAEL.

Accuracy of assumptions

The accuracy of the computed noise index values is subject to the reliability of the forecasts of aircraft movements in future years, and the correctness of the other input parameters to the noise model. Forecasting is outside the scope of this review.

With regard to the other input parameters to the model, there are fundamental assumptions which, given that this is an established airport and the modellers, Bickerdike Allen Partners (BAP), have been running noise models since the airport was first operated are not likely to be in error, such as runway lengths and thresholds, arrival and departure tracks and aircraft operational settings. It must be borne in mind that because of the abnormally steep approach and departure profiles in use at LCY, adjustments have to be made to achieve correspondence between modelled and measured noise levels. One of the most important assumptions on which the noise index computations rely relates to the noise levels of the new generation of aircraft with lower certificated noise levels. The ES Chapter 8 illustrates this effect by comparing future types with the Embraer E190, the most common type currently operating at the airport, showing that on departure the new types are of the order of 5 dBA quieter and on arrival they are about 3 dB quieter. This has been challenged by some responding to the consultation process, and was also challenged at the Luton inquiry with evidence from measurements at locations some distance from the airport that the differences in the field are much smaller.

Close to the airport, BAP's figures are not likely to be materially inaccurate, but further away where aircraft thrust settings are low and airframe aerodynamic noise predominates the difference between the two groups of aircraft will be smaller. However, the formal way of assessing airport noise effects does place weight on noise closer to the airport, and a smaller effect from the introduction of quieter aircraft at a distance from the airport does not come through the conventional assessment methodology. Although aircraft noise associated with LCY results in representations from residents in locations many miles from the airport, the noise index values are not computed at such distances and significant effects in the context of formal environmental assessment do not arise.

Conclusions reached with regard to noise and health and wellbeing

The summary conclusions of the two chapters are

Chapter 8 Noise

8.8.9 Overall, the proposed amendments are not forecast to result in significant adverse effects for any of the residents around the airport. The proposed amendments are expected to result in a faster transition to quieter, new generation aircraft. This will result in earlier reductions in daytime aircraft noise for local residents than would occur without the proposed amendments. The existing comprehensive sound insulation scheme will be further enhanced, with new eligibility criteria and an improved offer for those eligible for the middle tier of the scheme.

8.6.23 No significant daytime construction noise effects are predicted from the construction of the remaining elements of CADP1.

8.6.24 There will be a relatively small number of properties exposed to potentially significant levels of construction noise during OOOH works. All of these properties have already been treated or offered treatment by the airport's existing CSIS.

8.6.25 On the basis of the number of properties affected and the mitigation measures already provided, the residual construction noise effects are considered to be **Negligible** during daytime operational hours and a **Negligible to Minor Adverse** effect during OOOH periods. Overall, the construction noise effects associated with the construction of the remaining elements of CADP1 are similar to, or less than, those forecast in the 2015 UES.

8.6.236 In summary, the ground noise effects under the DC Scenario are generally greater than under the DM Scenario. The number of receptors adversely affected by daytime, night-time and weekend noise is higher under the DC Scenario. However, most receptors are exposed to daytime, night-time and weekend ground noise below the LOAEL. Very few receptors are exposed to daytime or weekend ground noise levels above the SOAEL and no receptors in the night-time.

8.6.237 A small proportion of receptors are forecast to experience potentially significant moderate increases in daytime, night-time and weekend ground noise. Most of these are student rooms in the UEL accommodation blocks. These blocks have a very good standard of sound insulation and were specifically designed to deal with noise from the airport. All of the receptors exposed to potentially significant moderate increases in ground noise are within the airport's air noise sound insulation contours and are therefore eligible for or already treated by the air noise SIS or the CSIS or were already designed with a good standard of sound insulation. These effects are therefore rated as not significant.

8.6.238 For the reasons outlined above, overall the daytime ground noise effects are rated as **Negligible** and the night-time and weekend ground noise effects are rated as **Negligible to Minor Adverse**.

Chapter 12 Health and Wellbeing

12.9.42 The overall population health effect from noise is characterised as being adverse in direction, permanent and due to direct health pathways. The professional judgement is that the significance of the population health effect would be minor adverse (not significant).

12.9.43 The conclusion can be broken down. Overall, the majority of the study area population would be below the SOAEL in all assessment years and scenarios. In relation to the small minority affected above SOAEL, taking into account the Sound Insulation Scheme as embedded mitigation, it is anticipated that the majority of those affected would have their effects reduced. A

minor adverse effect is considered appropriate to reflect that not all people would take up the scheme and there may be practical limitations on its effectiveness for some people, e.g. for structural reasons or due to personal choice to open windows in summer even where ventilation is provided. In line with good practice the Sound Insulation Scheme has had specific regard to indoor air quality and provides solutions that both increase sound insulation while maintaining adequate ventilation and thermal comfort. In relation to those between LOAEL and SOAEL who will experience a very low increase in noise (less than 3dB, with many below 2dB) the incremental effect to a large number of people (for night-time in 2025 and weekend daytime in 2031) is in population health terms noteworthy (i.e. not negligible); but equally given the very small change and the many other sources contributing to the local soundscape it is not considered a significant project level effect.

12.9.44 The effects are considered minor adverse as although there are sufficient causal associations established by the scientific literature, and the relevant thresholds of LOAEL and SOAEL are crossed (excluding effects of the Sound Insulation Scheme), the low magnitude of relative change due to the project would likely give rise to only a slight change in the population health baseline, even accounting for the presence of more vulnerable sub-populations. The effect is considered to have only a marginal effect on the ability to deliver current health policy. This conclusion places weight on the project mitigation measures, including minimising noise missions at source, effective communication between LCY and local communities, and the Sound Insulation Scheme.

Overall outcome of the Noise and Health and Well-being assessments

The fundamental outcome of the assessment is that as a result of implementing the proposals there would be an increase in the population exposed to noise above SOAEL. The Noise Policy Statement for England states that noise exposure above SOAEL should be avoided. In this context avoidance is achieved by the provision of sound insulation. The Health chapter points out that “A minor adverse effect is considered appropriate to reflect that not all people would take up the scheme and there may be practical limitations on its effectiveness for some people, e.g. for structural reasons or due to personal choice to open windows in summer even where ventilation is provided.”

It is therefore necessary to explore further the risk of sound insulation not being installed or not being fully effective. The starting point is to review the take-up and performance of sound insulation already provided under existing and pre-existing schemes. From the results of this review the potential for residents being exposed to SOAEL uninsulated under the DC scenario can be assessed, and a decision made regarding the consequences and possible alternative mitigation approaches.

Gaps in the noise assessment

The loss of the period of Respite on Saturday afternoons has been evaluated by considering overall weekend noise exposure in $L_{Aeq,T}$ terms, but reference has not been made to work which has been carried out at other airports, including Heathrow, into the value of periods of respite. The following extract from the paper “Respite from aircraft noise: high-level overview of journey on building our knowledge” by Nicole Porter, Andy Knowles, Robin Monaghan and Richard Norman (InterNoise 2022, Glasgow) is informative:

“What do we mean by respite?”

Respite is ‘A break from or a reduction in aircraft noise’. Predictable Respite is ‘Scheduled respite from aircraft noise for a period of time’. Respite noise change is the difference in noise level between different operational modes, most commonly measured as $L_{Aeq,T}$ for each mode of operation. These changes can be classified into 3 bands; dB changes of greater than 9 dB, 4-9

dB, and less than 4 dB.

How is respite subjectively perceived?

Predictable respite is generally viewed as of benefit and considered helpful as a mitigation measure to reduce the impacts of noise. It might be concluded that managed respite is effective – it is (genuinely) valued by residents, when they are informed of it – and they certainly don't want it removed. The degree of its effectiveness is dependent on both acoustic and non-acoustic factors. However, many residents are not aware of the current respite provision, and research has suggested that non-acoustic factors such as effectiveness of public engagement, trust and understanding could be at least as important as the respite noise level differences in terms of their appreciation of a noise respite intervention.”

The “current respite provision” referred to is the system of runway alternation at Heathrow, through which at a fixed time of day the runways used for arrivals and departures are switched so that residents in the areas around the runway ends cease to be overflowed. While the facility to operate runway alternation is restricted to airports with more than runway, the general principle of predictable periods when there is no (or much reduced) aircraft noise is applicable to weekends at LCY.

Sleep disturbance

With regard to sleep disturbance, the percentages highly sleep-disturbed presented in the World Health Organization Environmental Noise Guidelines for the European Region 2018 (ENG) are

L_{night}	%HSD	95% CI
40	11.3	4.72–17.81
45	15.0	6.95–23.08
50	19.7	9.87–29.60
55	25.5	13.57–37.41
60	32.3	18.15–46.36
65	40.0	23.65–56.05

Broadly speaking, an increase of 1dB results in an extra 1% of the population being Highly Sleep Disturbed. The ES finds that in several locations there are increases of up to 2 dB in summer $L_{Aeq,8h}$ which, if there is no major seasonal variation is equivalent to L_{night} , but the additional population likely to be highly sleep disturbed is not reported. The research which led to these figures did not take into account whether or not the residents studied had sound insulation installed in their homes. If that were taken into account, the %HSD could be less than reported in the WHO ENG. This may partly explain the very large overlap of the 95% confidence limits.

Technical issues raised in responses to consultation not already included in sections above

The following additional issues arise from the consultation responses that have been submitted:

Airspace changes

The application does not seek permission for airspace changes and does not directly involve changes to arrival and departure routes. Should such changes be required consequent upon implementation of the

application proposals the process required is separate from the planning process. However, the question arises whether such changes would be required and what the noise impact would be.

Impact on the transport network (noise effects)

The Environmental Statement includes consideration of the noise impact of potential changes in road traffic noise. It does not address possible changes in the frequency or timing of train services on the Docklands Light Railway, including whether there would be an increase in service frequency during the night period before 07:00 and thereby an increase in rail noise impact.

Delayed departures and arrivals

The London Borough of Lewisham has commented “It remains unclear why additional flexibility is sought for delayed departures and arrivals with the current cap of 400 allowing for at least one event per a day throughout the year.” (It should be noted that the applicant’s cover letter which provides detail of the S73 amendments sought has the word “delay” missing from its text of condition 17). The amendment to the wording of the last point of condition 17 aligns the unavoidable delay provision with the revised Saturday afternoon operational times.

A220-10 “Whale noise”

HACAN East raise the issue of “whale noise”. There are reports in various media (and footage on YouTube) of a moaning noise, howl, or a noise resembling underwater sounds emitted by whales associated with new versions of the Embraer A220, with explanations such as the effect of variable stator vanes and a geared turbofan. There are no data which enable the additional annoyance effect of this phenomenon to be quantified.

N65 Average Mode

SWSXFTF comment that the N65 contours are provided for average mode. This is because the correlation between N65 values and annoyance that is available (in SoNA 2014) is for average summer day, the same period used for $L_{Aeq\ 16h}$. N65 information is also provided for summer weekend days. When the N-above system was introduced at Sydney airport, it was for the purpose of using an index with a more direct meaning for the lay person. It is not clear that providing separate N65 contours for westerly and easterly modes would assist the lay person, who would still need to balance the number of days on which each mode may occur.

Matters which need to be taken into account in considering the application

In considering the application the planning authority needs to take the following points into account.

- While the ES conclusion is that the effect of implementing the proposals in the application would be minor adverse (not significant), any beneficial aspects which could weigh in the balance favourably in order to support an approval need to be captured. The additional aircraft movements in the early morning will certainly be noticed, at the very least, as will the loss of Saturday afternoons as a respite period. It may be that this loss is a significant effect, contrary to the conclusions of the ES. The answer could be obtained by a local social survey in overflowed residential areas.

- The applicant's case is that making LCY more attractive to airline operators will induce the introduction of a greater proportion of quieter aircraft types earlier. LCY operates a noise Quota Count system, in accordance with Condition 18 (Aircraft Noise Categorisation Scheme) of the CADP1 planning permission. Under the ANCS, each aircraft type is assigned a separate quota count (QC) for arrivals and for departures, based on their certification noise levels and categorised into 1 dB bands. The QC system is similar to that operated at many UK airports at night. The ANCS QC system has an annual limit of 22,000 per calendar year, with a maximum of 742.5 in any single week. These limits are reviewed regularly. However, while the ANCS is structured to enable benefits of quieter aircraft types and number to be captured in the periodic review of the limits, it would be possible to look forward to the forecasts in future years given in the ES and to set out accompanying provisional future limits for the ANCS system.
- Condition 33 of the CADP1 planning permission sets a limit on the area of the 57 dB $L_{Aeq,16h}$ contour of 9.1 km² and LCY is required to produce a Noise Contour Strategy that seeks to reduce the area of the noise contour by 2030 and every 5 years thereafter. As with the ANCS it would be possible to take into account the forecasts of reduced contour areas in future years, namely 8.5 km² (2025), 6.5 km² (2027) and 7.2 km² (2031) and to incorporate a reduced area or areas in a revised Condition 33 as part of any grant of permission for this application. Although Condition 33 is not included in the list of conditions with respect to which variation is applied for, the cover letter includes reference to variations in the contour areas in stages, under the heading "Reference Updates to other CADP1 Planning Conditions", viz:

Up to the passenger throughput at London City Airport exceeding 6,5 million passengers in any 12-month period (to be taken from 1 January to 31 December unless a different 12-month start and end date is agreed), the area enclosed by the 57dB daytime noise contour shall not exceed 9.1 km² or any lower figure as agreed pursuant to the Noise Contour Strategy approved on [x].

Upon the passenger throughput at London City Airport exceeding 8 million passengers in any 12-month period (to be taken from 1 January to 31 December unless a different 12-month start and end date is agreed), the area enclosed by the 57dB daytime noise contour shall not exceed x km².

The area enclosed by the 57dB daytime noise contour shall not exceed x km² from when passenger throughput at London City Airport reaches 9 mppa in any 12-month period.

Forecast aircraft movements and consequential forecast and actual noise contours for the forthcoming year shall be reported to the Local Planning Authority annually within the Annual Operations Monitoring Report.

The values of "x" would need to be entered before grant of the S73 application.