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# London Luton Airport Expansion

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**5.02 Appendix 16.2 Operational Noise Management  
(Explanatory Note) (Tracked Change Version)**

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**London Luton Airport Expansion Development Consent  
Order 202x**

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**5.02 ENVIRONMENTAL STATEMENT APPENDIX 16.2  
OPERATIONAL NOISE MANAGEMENT (EXPLANATORY NOTE)  
(TRACKED CHANGE VERSION)**

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# 1 INTRODUCTION

- 1.1.1 Luton Rising (a trading name of London Luton Airport Limited (the 'Applicant')), is proposing to expand London Luton Airport (the airport) through an application for development consent for works that would allow growth from the current permitted capacity to accommodate 32 mppa (hereon referred to as the 'Proposed Development').
- 1.1.2 This document is an appendix to **Chapter 16** Noise and vibration of the Environmental Statement (ES) [~~REP1-003d9-ref~~**TR020001/APP/5.01**] submitted as part of the application for development consent. It provides further detail and explanation of the mitigation and compensation described in the assessment presented in the ES chapter.
- 1.1.3 A description of the approach to noise management (mitigation and compensation) and how the aims of Government noise policy have been used to define the noise mitigation hierarchy is presented in **Section 2**.
- 1.1.4 Information on the Noise Envelope, and how it has been developed in line with policy and guidance, is described in **Section 3**. The Noise Envelope Design Group's Final Report is contained in **Annex A**, and the Applicant's response to the Noise Envelope Design Group's Final Report is contained in **Annex B**.
- 1.1.5 Additional air noise controls secured through the Air Noise Management Plan [TR020001/APP/8.125d9-ref] are presented in Section 4.
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- 4.1.61.1.8 The noise management process to be applied to new fixed plant noise from the Proposed Development is presented in **Section 775**.
- 4.1.71.1.9 To provide a single summary of the secured noise management measures for the Proposed Development, this appendix repeats some of the information in **Chapter 16** Noise and vibration of this ES [~~TR020001/APP/5.01d9-ref~~**REP1-003**] and other documents. Where additional information can be found in other documents, cross-references are provided.

## 2 APPROACH TO NOISE MANAGEMENT (MITIGATION AND COMPENSATION)

### Overview

- 2.1.1 The overall approach to mitigation and how it is considered in the Environmental Impact Assessment (EIA) is provided in **Chapter 5** Approach to the Assessment of this ES [\[TR020001/APP/5.01AS-075\]](#). This section provides further detailed information on mitigation and compensation measures specifically as they relate to the operation of the expanded airport and how it meets the aims of Government noise policy.
- 2.1.2 To mitigate the effects of the Proposed Development, a range of measures are proposed as described in the following sub-sections. In line with aviation policy (Ref. 1), the Noise Policy Statement for England (NPSE, Ref 2), Planning Practice Guidance Noise (PPGN, Ref. 3) and Government's policy on sustainable development, the Proposed Development includes noise mitigation measures to:
- a. limit and, where possible, reduce the number of people significantly affected by adverse impacts from aircraft noise;
  - b. prevent unacceptable adverse effects on health and quality of life from noise;
  - c. avoid significant adverse effects on health and quality of life from noise;
  - d. mitigate and minimise adverse effects on health and quality of life from noise;
  - e. where possible contribute to improvements of health and quality of life from noise; and
  - f. share the benefits of future technological improvements between the airport and its local communities to achieve a balance between growth and noise reduction.
- 2.1.3 The NPSE clarifies that the second aim of Government noise policy to 'mitigate and minimise adverse effects<sup>1</sup> on health and quality of life' (NPSE, paragraph 1.7) relates to noise exposure above the Lowest Observed Adverse Effect Level (LOAEL)<sup>2</sup> and below the Significant Observed Adverse Effect Level (SOAEL), i.e. where adverse effects could occur. In this situation, mitigation should be included (i.e. embedded) into the Proposed Development to minimise noise as far as reasonably practicable. This is described in the NPSE explanatory note as follows (at paragraph 2.24):
- 2.1.4 *"The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality*

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<sup>1</sup> The NPSE uses the term 'impacts' but that has been changed here to 'effects' to align with terminology used in the ES

<sup>2</sup> For the definitions of LOAEL and SOAEL please refer to **Chapter 16** Noise and vibration of this ES [\[TR020001/APP/5.01\]](#)

*of life while also taking into account the guiding principles of sustainable development (paragraph 1.8). -This does not mean that such adverse effects cannot occur.”*

- 2.1.5 In line with noise policy all noise management measures are therefore defined as ‘embedded mitigation’ or are compensatory mitigation measures (noise insulation).
- 2.1.6 The noise management measures embedded into the Proposed Development collectively meet the second and third aims of Government noise policy to mitigate and minimise adverse effects on health and quality of life from noise and where possible contribute to improvements in health and quality of life from noise, and contribute to meeting the first aim, all within the context of Government policy on sustainable development.
- 2.1.7 The compensatory mitigation measures (see **Compensation Policies, Measures and Community First [REP2-005TR020001/APP/7.10d9-ref]**) have been developed so that in combination with the embedded noise management measures, together they meet the first aim of Government noise policy to avoid significant adverse effects on health and quality of life from noise. This is achieved through the noise insulation scheme which provides a full package of noise insulation where air noise exposure from the development exceeds the relevant SOAEL values (see **Section 554**).

### **Noise management hierarchy**

- 2.1.8 To meet the aims of Government noise policy, and to generally minimise noise as far as reasonably practicable, noise management and control measures have been embedded into the Proposed Development or defined in compensation policies in the following order:
- a. **Mitigation at source:** optimise the construction and masterplan to minimise noise ‘at source’ (e.g. the design and location of fixed plant noise sources and the location of taxiways and Engine Run Up Bay); and then
  - b. **Mitigation by intervention:** measures used purely to control the path of noise from source to receiver (e.g. flight paths [noise preferential routes], noise barriers and bunds); and then
  - c. **Mitigation by compensation:** through the provision of noise insulation for the receptor (residential and non-residential).

## 3 NOISE ENVELOPE

### 3.1 Overview

3.1.1 The Noise Envelope is a legally binding framework to monitor, manage and control aircraft noise, including a defined mechanism to share the noise reduction benefits of future technological improvements in aircraft between the airport and local communities. The Noise Envelope will be secured as part of the Development Consent Order (DCO) through the Green Controlled Growth Framework (GCG, see **Green Controlled Growth Explanatory Note [TR020001/APP/7.07d9-refREP3-015]**) and will be a legally binding framework of limits and controls to manage aircraft noise. The **Green Controlled Growth Explanatory Note [TR020001/APP/7.07d9-refREP3-015]** includes details on how the Noise Envelope will be enforced through GCG, including independent oversight and scrutiny.

3.1.2 In essence, the noise envelope defines the noise outcomes to be achieved, or bettered, rather than the specific mitigation steps employed to achieve the outcomes. -Given that the airport expansion is planned over an extended period of time, this approach provides appropriate flexibility for the airport operator to identify and implement the optimum mitigation and draw on future technology improvement whilst also providing certainty of the outcomes that will result even in the reasonable worst-case scenario.

3.1.3 This section of this appendix describes how the Noise Envelope has been developed in line with Government policy and relevant guidance.

### 3.2 Noise Envelope policy

#### Summary of Noise Envelope policy

3.2.1 The concept of Noise Envelopes was introduced in aviation policy in the 2013 Aviation Policy Framework (APF) (Ref. 1). The APF states at paragraph 3.28 and 3.29:

3.2.2 *“The Government expects airports to make particular efforts to mitigate noise where changes are planned which will adversely impact the noise environment. This would be particularly relevant in the case of proposals for new airport capacity, changes to operational procedures or where an increase in movements is expected which will have a noticeable impact on local communities. In these cases, it would be appropriate to consider new and innovative approaches such as noise envelopes or provision of respite for communities already affected.”*

3.2.3 *The Government wishes to pursue the concept of noise envelopes as a means of giving certainty to local communities about the levels of noise which can be expected in the future and to give developers certainty on how they can use their airports. Following any such recommendations made by the Airports Commission, in the case of any new national hub airport capacity or any other airport development which is a nationally significant infrastructure project, the Government is likely to develop a National Policy Statement (NPS) to set out*

*the national need for such a project. The Government would determine principles for the noise envelope in the NPS having regard to the following:*

- a. *The Government's overall noise policy.*
- b. *Within the limits set by the envelope, the benefits of future technological improvements should be shared between the airport and its local communities to achieve a balance between growth and noise reduction.*
- c. *The objective of incentivising airlines to introduce the quietest suitable aircraft as quickly as is reasonably practicable."*

3.2.4 The Airports National Policy Statement (ANPS) (Ref. 4) sets out the requirements for the Noise Envelope for the Heathrow Northwest Runway. The ANPS does not have effect in relation to an application for development consent for an airport development not comprised of an application relating to the Heathrow Northwest Runway. Nevertheless, as set out within paragraph 1.41 of the ANPS, the Secretary of State considers that the contents of the ANPS will be both important and relevant considerations in the determination of an application, particularly where it relates to London or the south east of England. The ANPS states, at paragraph 5.60:

3.2.5 *"The applicant should put forward plans for a noise envelope. Such an envelope should be tailored to local priorities and include clear noise performance targets. As such, the design of the envelope should be defined in consultation with local communities and relevant stakeholders, and take account of any independent guidance such as from the Independent Commission on Civil Aviation Noise. The benefits of future technological improvements should be shared between the applicant and its local communities, hence helping to achieve a balance between growth and noise reduction. Suitable review periods should be set in consultation with the parties mentioned above to ensure the noise envelope's framework remains relevant."*

3.2.6 Following the publication of the ANPS, the Government issued a consultation document, Aviation 2050: The Future of UK Aviation (Ref. 5), which set out the draft strategy for the evolution of aviation policy. Aviation 2050 states, at paragraph 3.115:

3.2.7 *"The proposed new measures are: ... routinely setting noise caps as part of planning approvals (for increase in passengers or flights).<sup>77</sup> The aim is to balance noise and growth and to provide future certainty over noise levels to communities. It is important that caps are subject to periodic review to ensure they remain relevant and continue to strike a fair balance by taking account of actual growth and the introduction of new aircraft technology. It is equally important that there are appropriate compliance mechanisms in case such caps are breached and the government wants to explore mechanisms by which airports could 'pay for' additional growth by means of local compensation as an alternative to the current sanctions available."*

3.2.8 Footnote 77 from the above paragraph states:

3.2.9 *"A noise cap (also known as a noise envelope) is any measure which restricts noise. In its crudest form this could be a simple movement cap, but the*



*government proposes advocating caps which are based on setting maximum noise exposure levels (such as contour area or noise quota). Noise caps should also consider the effect of night flights, given the health costs associated with sleep disturbance. These costs need to balance the benefits of night flights and any restrictions should be proportionate to local circumstances.”*

**3.2.10** The latest policy relevant to aviation noise is Flightpath to the Future (FTTF) (Ref. 6) and the ~~Oe~~Overarching Aviation Noise Policy Statement (OANPS, Ref. 7). Whilst FTTF does not make reference to Noise Envelopes, it provides a cross reference to the policy proposals in Aviation 2050. The Proposed Development’s compliance with the OANPS is set out in **Commentary on the Overarching Aviation Noise Policy Statement [TR020001/APP/8.24REP1-012]**.

~~3.2.10~~

### 3.3 Noise Envelope proposals - compliance with policy

3.3.1 Based on the policy documents described above, it is therefore considered that, to be compliant with noise policy, a Noise Envelope should:

- a. give certainty to local communities about the levels of noise which can be expected in the future and to give developers certainty on how they can use their airports (through clear noise performance targets);
- b. have regard to Government overall noise policy;
- c. provide a mechanism to share the benefits of future technological improvements between the airport and its local communities to achieve a balance between growth and noise reduction;
- d. incentivise airlines to introduce the quietest suitable aircraft as quickly as is reasonably practicable;
- e. be defined in consultation with local communities and relevant stakeholders;
- f. take account of any independent guidance;
- g. be subject to periodic review; and
- h. contain appropriate compliance mechanisms.

3.3.2 The Noise Envelope proposals contained in **Green Controlled Growth Explanatory Note [TR020001/APP/7.07d9\_refTR020001/APP/7.07]** are considered to be compliant with the above policy requirements as described in **Table 3.1Table 3.1Table 3.1**.

Table 3.1: Noise Envelope proposals compliance with policy

Policy consideration	How the Noise Envelope proposals comply
The Noise Envelope should give certainty to local communities about the levels of noise which can be	The Noise Envelope contour area Limits (see <b>Green Controlled Growth Explanatory Note [TR020001/APP/7.07d9_refREP3-015]</b> ) will be legally binding and will provide certainty to local communities

Policy consideration	How the Noise Envelope proposals comply
<p>expected in the future and to give developers certainty on how they can use their airports (through clear noise performance targets).</p>	<p>that the noise levels and effects predicted in <b>Chapter 16 Noise and vibration [TR020001/APP/5.01d9-refREP1-003]</b> of the ES will not be exceeded.</p>
<p>The Noise Envelope should have regard to Government overall noise policy.</p>	<p><b>Section 2</b> of this appendix sets out how the Noise Envelope, together with the compensatory measures and other mitigation described in <b>Chapter 16 Noise and vibration [TR020001/APP/5.01d9-refREP1-003]</b> of the ES collectively meet the aims of Government noise policy.</p>
<p>The Noise Envelope should provide a mechanism to share the benefits of future technological improvements between the airport and its local communities to achieve a balance between growth and noise reduction.</p>	<p>See following section of this appendix “Sharing the Benefits”</p>
<p>The Noise Envelope should incentivise airlines to introduce the quietest suitable aircraft as quickly as is reasonably practicable.</p>	<p>GCG (see <b>Green Controlled Growth Explanatory Note [TR020001/APP/7.07d9-refREP3-015]</b>) includes mechanism for capacity declarations for slot allocation purposes to be tied to the environmental performance of the airport, incentivising the adoption of quieter aircraft by airlines to avoid limitations on capacity. The Noise Envelope also contains a mechanism for the noise contour area Limits to reviewed and reduced if reasonably practicable in future years as quieter next generation aircraft become available to the fleet, further incentivising airlines to adopt the next-generation of quieter aircraft in order to avoid limitations on capacity.</p>
<p>The Noise Envelope should be defined in consultation with local communities and relevant stakeholders.</p>	<p>The Noise Envelope proposals have been developed in consultation with the Noise Envelope Design Group (NEDG) and has taken regard of their recommendations. The <del>Noise Envelope Design Group</del><b>NEDG</b> contains representatives from industry, community groups, local authorities and independent experts. The membership of the NEDG is described in <b>Section 16.4 of Chapter 16 Noise and vibration [TR020001/APP/5.01d9-refREP1-003]</b> of the ES. Engagement with the NEDG is also described in the NEDG Final Report (see <b>Annex A</b>).</p> <p>A total of 19 meetings have been held with the NEDG between 2019 and 2022. This engagement is summarised in <b>Section 16.4 of Chapter 16 Noise and</b></p>

Policy consideration	How the Noise Envelope proposals comply
	<p>vibration <a href="#">[TR020001/APP/5.01d9-refREP1-003]</a> of the ES.</p> <p>Throughout this process, community groups have been represented in the NEDG by the Luton and District Association for the Control of Aircraft Noise (LADACAN) representative and, whilst they were active, the London Luton Airport Town and Village Community Committee (LLATVCC, now disbanded). As part of the NEDG terms of reference, this representation was on behalf of all community groups. The NEDG worked with the LADACAN representative to enable draft proposals to be shared and commented on by other established community groups.</p> <p>In response to engagement with the <a href="#">A</a>applicant, and the <a href="#">A</a>applicant’s proposals for the Noise Envelope, the NEDG produced an Interim Report (in August 2020) and a Final Report (in December 2022), containing their recommendations for the Noise Envelope and their views on the <a href="#">A</a>applicant’s Noise Envelope proposals. These reports are provided in <b>Annex A</b> to this appendix. The <a href="#">A</a>applicant’s response to the NEDG Final report is presented in <b>Annex B</b> to this appendix.</p> <p>As well as engagement with the NEDG, the developing Noise Envelope proposals have been widely consulted on through two statutory public consultations. The consultation was open to the public and all community groups. The consultation also specifically included Huntingdonshire District Council and Cambridge City Council who are affected by recent airspace change. The Consultation Report and Appendices submitted with the application for development consent (<a href="#">[TR020001/APP/6.01AS-048]</a> and <a href="#">[TR020001/APP/6.0APP-1724 to APP-193]</a>) contain a full account of the previous statutory consultation process and issues raised in feedback relating to the Noise Envelope proposals, as well as responses to feedback and how relevant feedback has been addressed in the Noise Envelope proposals.</p> <p>The proposals for the GCG Framework and the Noise Envelope included in the application for development consent (see <b>Green Controlled Growth Explanatory Note</b> <a href="#">[TR020001/APP/7.07d9-refREP3-015]</a>) are a</p>

Policy consideration	How the Noise Envelope proposals comply
	refinement and improvement of the proposals presented as part of the statutory consultation, taking account of responses to the statutory consultation and recommendations from the NEDG.
The Noise Envelope should take account of any independent guidance.	<p>This policy as set out in the ANPS specifically references the Independent Commission on Civil Aviation Noise (ICCAN). Although ICCAN are now disbanded, they were an invited member of NEDG whilst in operation.</p> <p>Whilst it has been confirmed that the Civil Aviation Authority (CAA) will take on some of the duties of ICCAN, at the time of development of the Noise Envelope, the CAA’s role with regards to Noise Envelopes was not yet confirmed. However, guidance from the CAA on Noise Envelopes (Ref. 8) has been used to develop the Noise Envelope proposals.</p> <p>The <del>Noise Envelope Design Group</del><a href="#">NEDG</a> also contained an independent noise expert.</p>
The Noise Envelope should be subject to periodic review.	<p>The GCG framework (within which the Noise Envelope is embedded) contains a mandatory periodic review mechanism, to review whether the overall processes of the framework are working as intended. Specifically for the Noise Envelope contour area Limits, a formal mechanism has also been included for these to be periodically reviewed, and potentially for more ambitious Limits to be adopted where future technology and circumstances allow see <b>Green Controlled Growth Explanatory Note [TR020001/APP/7.07d9-refREP3-015]</b> for further details.</p> <p>The review cycle for the Noise Envelope has been set at five years to align with the Noise Action Plan cycle set by the Environmental Noise Regulations (Ref. 9). This is in line with CAA guidance (Ref. <a href="#">887</a>) which states: “<i>The review cycle of the Environmental Noise Directive (END)<sup>3</sup> is every five years. The Night Flying restrictions (which apply to the designated airports) have historically been reviewed every five or six years, however the latest proposal is for a three-year regime. These precedents may be useful in informing appropriate reviewing cycles for noise envelopes.</i>”</p>

<sup>3</sup> The Environmental Noise Directive is mapped across to UK law in the Environmental Noise (England) Regulations 2006, as amended (Ref. [98](#)).

Policy consideration	How the Noise Envelope proposals comply
<p>The Noise Envelope should contain appropriate compliance mechanisms.</p>	<p>Compliance with the Noise Envelope will be enforced through the legally binding terms of the DCO. The GCG Framework (within which the Noise Envelope is embedded) clearly sets out the steps that must be taken when a breach of a Noise Envelope Limit occurs, and it would only be a non-compliance with those defined processes of the GCG Framework that would represent a breach of the legally binding terms of the DCO, and hence enforcement action could be taken against the non-compliant party. In developing the GCG Framework, careful consideration has therefore been given to how enforcement action could be taken should this situation occur. Details on the compliance mechanisms are presented in the <b>Green Controlled Growth Explanatory Note [TR020001/APP/7.07d9_refREP3-015]</b>.</p>

## Sharing the benefits

### *Policy and guidance on ‘sharing the benefits’*

- 3.3.3 As described above, Government aviation policy relating to Noise Envelopes requires that Noise Envelopes should provide a mechanism to ‘share the benefits’ of future technological improvements between the airport and its local communities to achieve a balance between growth and noise reduction. Whilst the economic benefit of growth is a factor that must be considered when ‘sharing the benefits’, this section of the appendix specifically deals with how the Noise Envelope proposals have been designed to share the benefits in terms of the balance between growth and noise reduction.
- 3.3.4 Policy does not provide details on how ‘sharing the benefit’ should be measured, or quantify the proportion of sharing that should occur between the airport and communities. However, the CAA’s *CAP1129 Noise Envelopes*, produced in response to the APF, provides some guidance on ‘sharing the benefits’. CAP1129 does not have paragraph numbers, but the following quotes are taken from the section “Sharing the benefits” in “Chapter 4: Setting the limits”.
  - 3.3.5 CAP1129 provides context to the concept of sharing the benefits as follows:
  - 3.3.6 *“A stakeholder response to the draft APF considered that aviation should be allowed to grow within specified environmental limits on noise. If the industry is to be encouraged to research and deploy innovative approaches to environmental issues then it should be rewarded with access to growth.”*
  - 3.3.7 CAP1129 goes on to describes two ‘bookends’ of sharing the benefits:
  - 3.3.8 *“If limits based on inputs are held at a constant level, once they are met, no further growth would be permitted and any improvements in quiet aircraft*

*technology would be of greatest benefit to local communities rather than to industry. An example of this is the Heathrow Terminal 5 movement cap.*

- 3.3.9 *Conversely, if limits based on noise exposure or impact are held at a constant level, the improvements in quiet aircraft technology would most likely be used to permit increased numbers of movements. As such, the greatest benefit would be to industry rather than to local communities.*
- 3.3.10 *In the former case, there would be little, if any, incentive to realise further noise reductions through the continued development of quiet aircraft technology. In the latter example, it is likely that industry would be highly incentivised to realise noise reductions.”*
- 3.3.11 CAP1129 then goes on to say that Noise Envelope limits could be dynamic to avoid the ‘bookend’ scenarios described above:
- 3.3.12 *“To incentivise noise reduction such that the benefits are shared between industry and local communities, noise envelope limits could be dynamic. For example, as aircraft technology improves, the noise contour limit could reduce or tighten at a predefined rate in conjunction with a steady increase in the numbers of permitted ATMs. The setting of this rate of change could be informed by forecasting the rate of improvement of aircraft technology using manufacturers’ data and identifying trends from historical noise data and using this to make predictions.”*
- 3.3.13 CAP1129 also notes that Noise Envelope limits should not be pre-defined far into the future due to the uncertainties of aircraft forecasting and technology improvements:
- 3.3.14 *“The temporal horizon for which we have sufficient information on future aircraft noise levels to enable predictions to be made is limited by information provided by aircraft manufacturers. As it would be unfair to set envelope criteria to be applied at a future time for which we cannot make sufficiently accurate predictions, this horizon to some extent defines the lifetime of a noise envelope regime. In other words, even though a noise envelope regime should be a long-term agreement, it must also be finite and require renewal.”*

### **How the Noise Envelope ‘shares the benefits’**

#### **Overview**

- 3.3.15 The proposed Noise Envelope meets the guidance described above and ‘shares the benefits’ in line with policy (specifically in terms of noise) as follows.
- 3.3.16 Noise Envelope Limits are always set below the 2019 Actuals baseline for daytime and night-time and are always set below the 2019 Consented baseline for the daytime ~~from 2029 onwards~~. The noise limits step down in five year intervals to 2039. This demonstrates that benefit is being shared with the communities and that noise contour areas are reducing, despite growth at the airport (i.e. demonstrating a balance between the airport and communities).
- 3.3.17 The Noise Envelope also contains a mechanism for the Noise Limits to be reviewed and reduced in future years (beyond the 2030s) if and when quieter

'next generation' aircraft become available that would enable lower noise levels to be achieved and benefits shared between the airport and communities. This Noise Limit Review process will:

- a. permit the Proposed Development airport growth;
- b. reduce the Noise Limits and corresponding Thresholds if reasonably practicable; and
- c. where (b) identifies opportunities to reduce noise Limits and corresponding Thresholds, reduce the Noise Limits so they are below the 2019 Consented baseline as quickly as is reasonably practicable to share the benefits of the technology improvement with the communities affected by aircraft noise.

3.3.18 These Limits and mechanisms are described in detail in the **Green Controlled Growth Explanatory Note** [[TR020001/APP/7.07d9\\_refREP3-015](#)].

### **How the Limits defined in the Noise Envelope demonstrate 'sharing the benefits'**

3.3.19 Whilst, as described above, there is no formal definition or detail on how 'sharing the benefits' should be quantified, the following paragraphs describe, using noise contour areas, how the benefits of technology are shared between the airport and community in the proposed Noise Envelope. The sharing is quantified with reference to the scenarios referenced in the CAP1129 guidance document as described above:

- a. **Scenario A** – a scenario where the noise contour area limit is reduced to match the reduction in noise contour that would be seen without the Proposed Development, i.e. no further growth is permitted, but quieter aircraft continue to transition into the fleet. This is equivalent to the Do-Minimum scenario that is used in the noise assessment in **Chapter 16** Noise and vibration of the ES [[TR020001/APP/5.01d9\\_refREP4-003](#)]. This Do-Minimum scenario is compliant with the current consented long-term noise limits. In this scenario, the greatest benefit would be to the communities rather than to the airport.
- b. **Scenario B** - a scenario where a fixed noise contour area limit is set with reference to the 2019 Consented baseline. In this scenario, the improvements in aircraft noise technology could be used to permit increased numbers of movements up to the fixed contour area limit, and there would be no reduction in noise contour area compared to the baseline. As such, the greatest benefit would be to the airport rather than to local communities.

3.3.20 As Scenario A represents full benefit going to the communities and Scenario B represents full benefit going to the airport, benefits are shared when the Noise Envelope Limits are positioned between Scenario A and B. The position of the Noise Envelope Limits relative to Scenario A and B are presented in **Inset 3.1** **Inset 3.1** **Inset 3.1** for daytime and **Inset 3.2** **Inset 3.2** **Inset 3.2** for night-time. As the actual noise contour area depends on the forecast, versions of these insets have also been provided which show how the proportion of sharing could

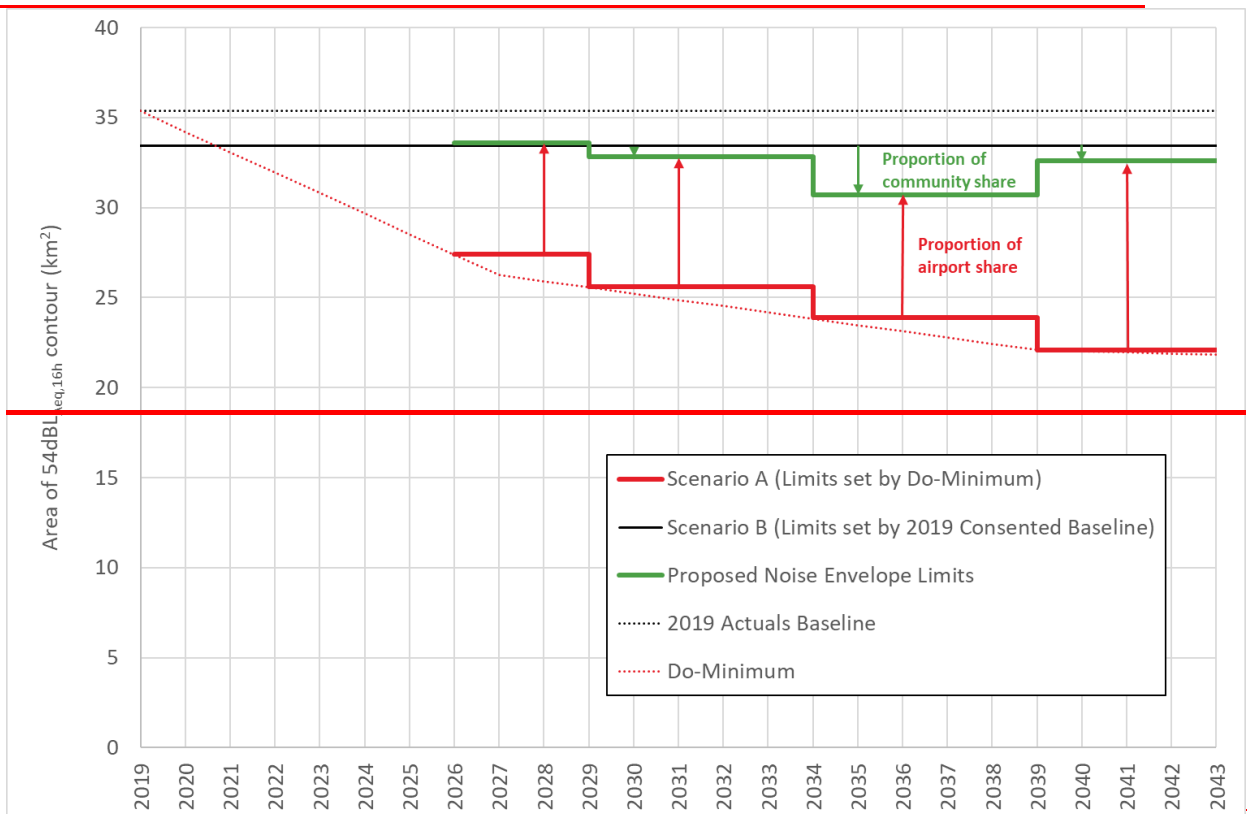
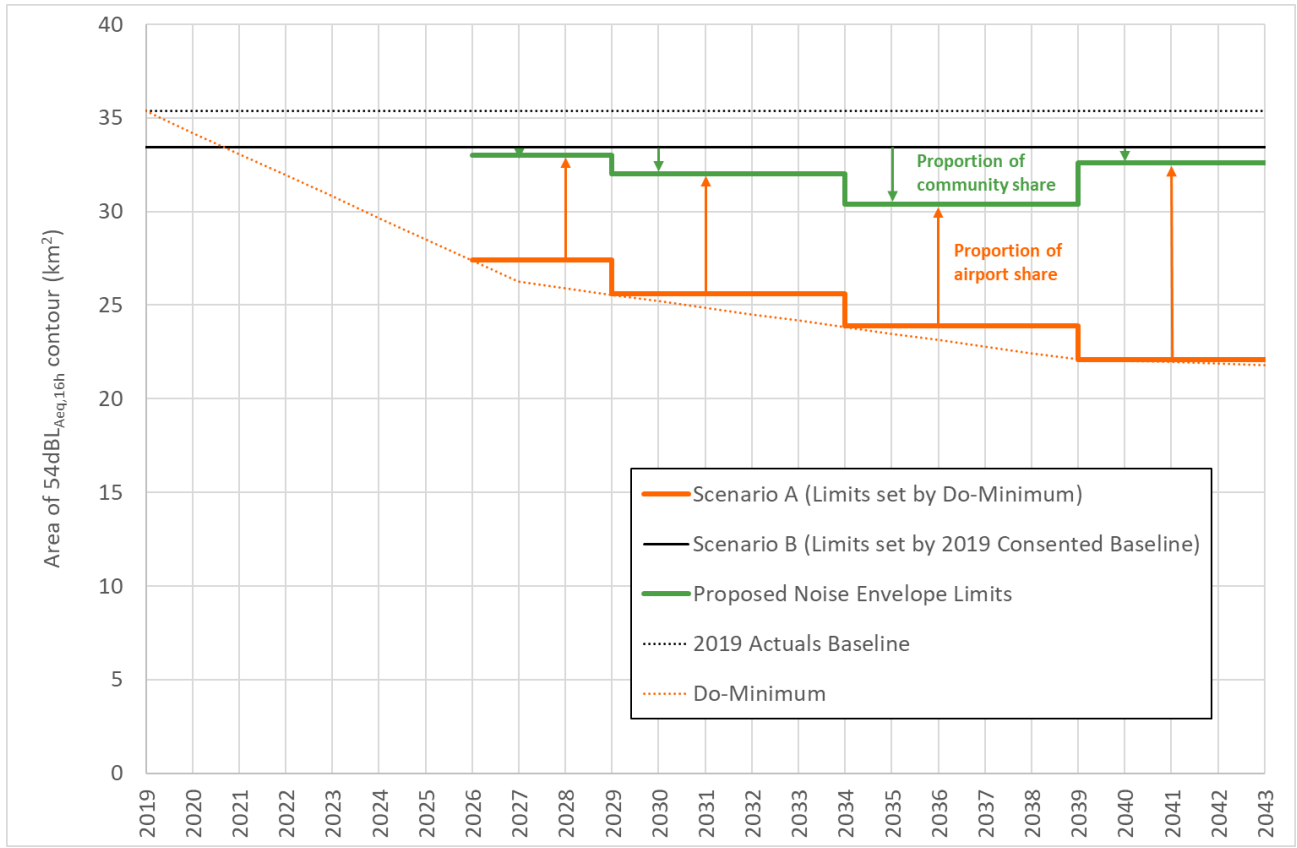
vary depending on the forecast (using the core, slower growth and faster growth scenarios from the noise assessment presented in **Chapter 16** Noise and vibration of the ES [~~TR020001/APP/5.01d9-ref~~REP1-003]<sup>4</sup>). These are shown in ~~Inset 3.3~~~~Inset 3.3~~~~Inset 3.3~~ for daytime and ~~Inset 3.4~~~~Inset 3.4~~~~Inset 3.4~~ for night-time. The blue shading in these insets represents the potential range in noise contour areas depending on the assessed growth forecasts. These insets demonstrate that 'sharing the benefit' can be demonstrated with reference to the 2019 Consented baseline for the daytime, as the Noise Envelope Limits are always set below the 2019 Consented baseline ~~from 2029 onwards~~. 'Sharing the benefit' can be demonstrated for the night-time for the slower growth scenario from 2029 onwards.

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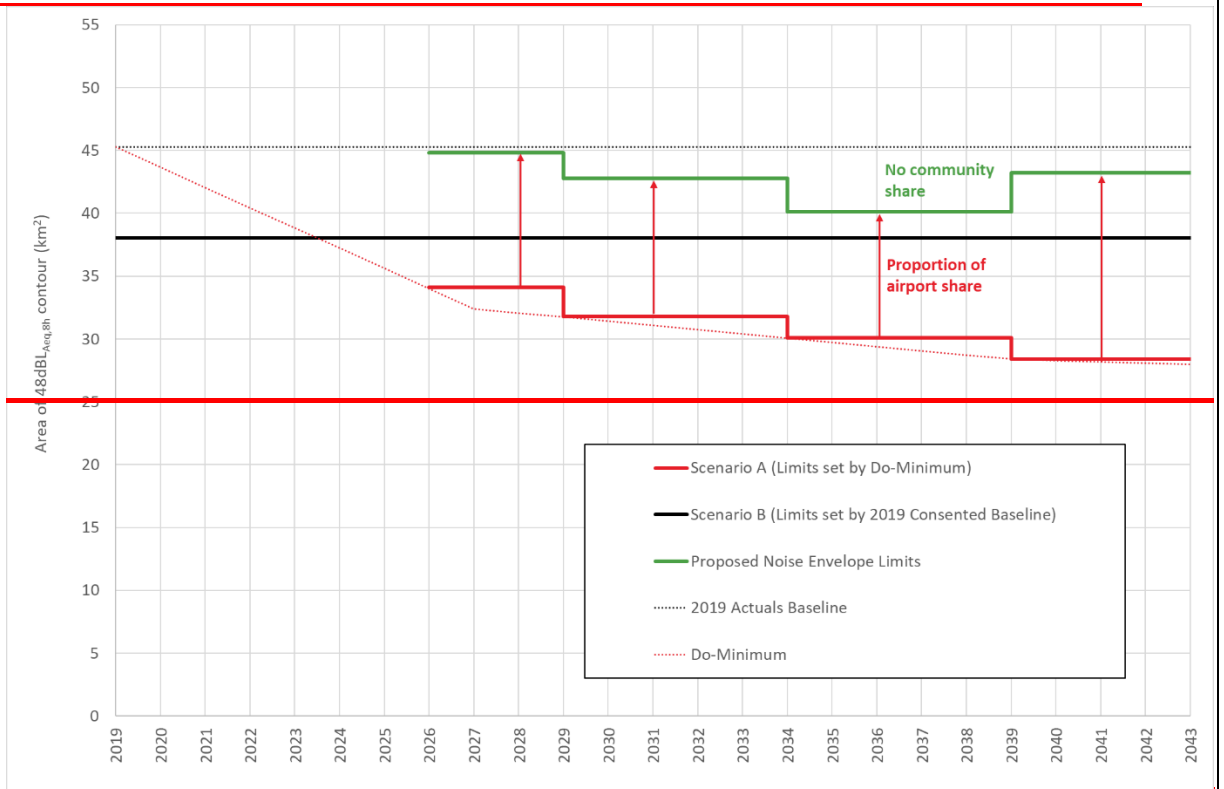
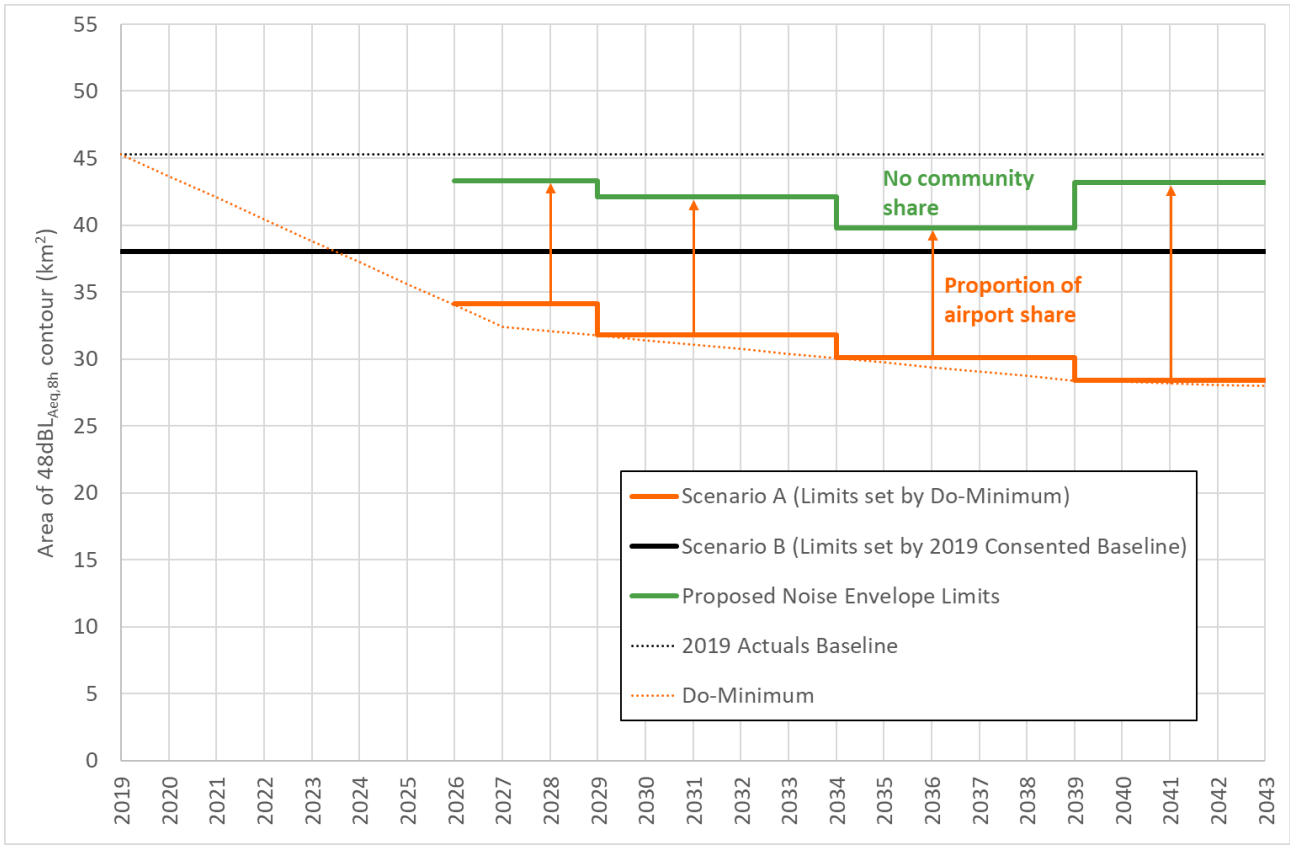
<sup>4</sup> The Faster Growth scenario has been updated since the ES as set out in Applicant's position on contour and movement limits [TR020001/APP/8.184d9-ref]



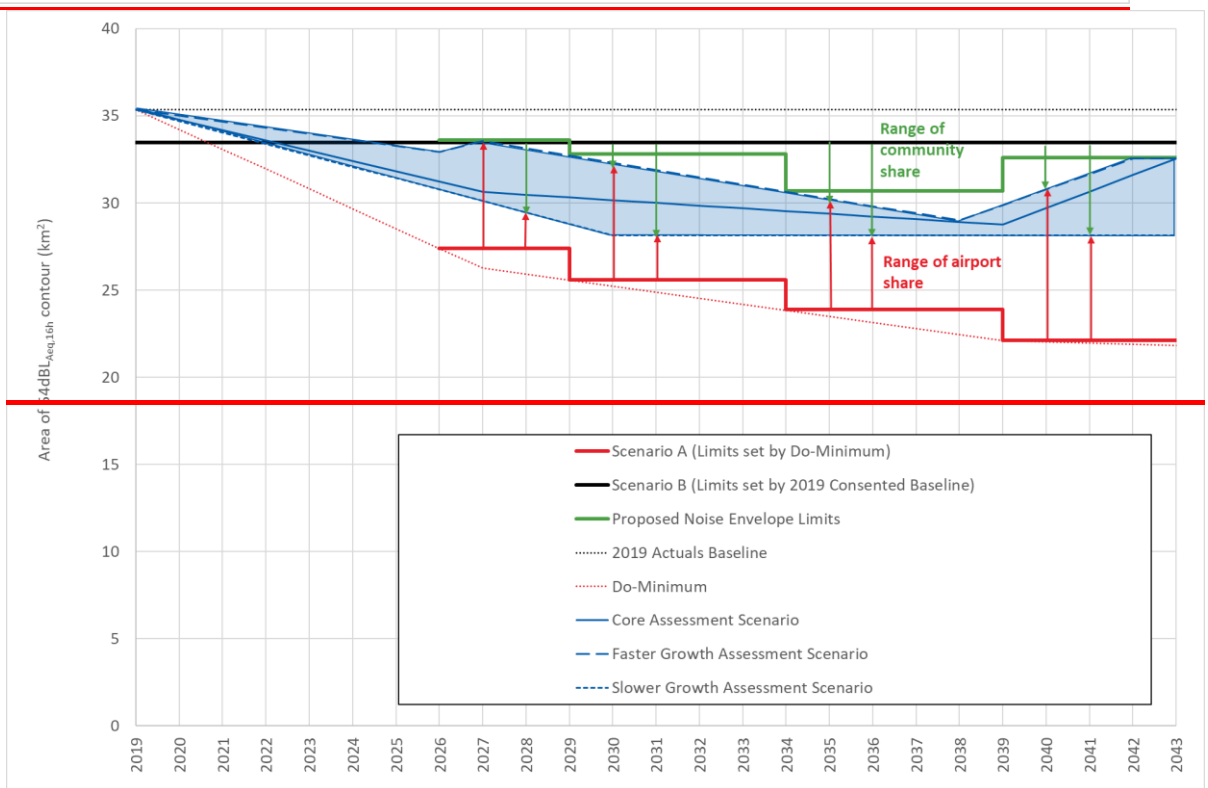
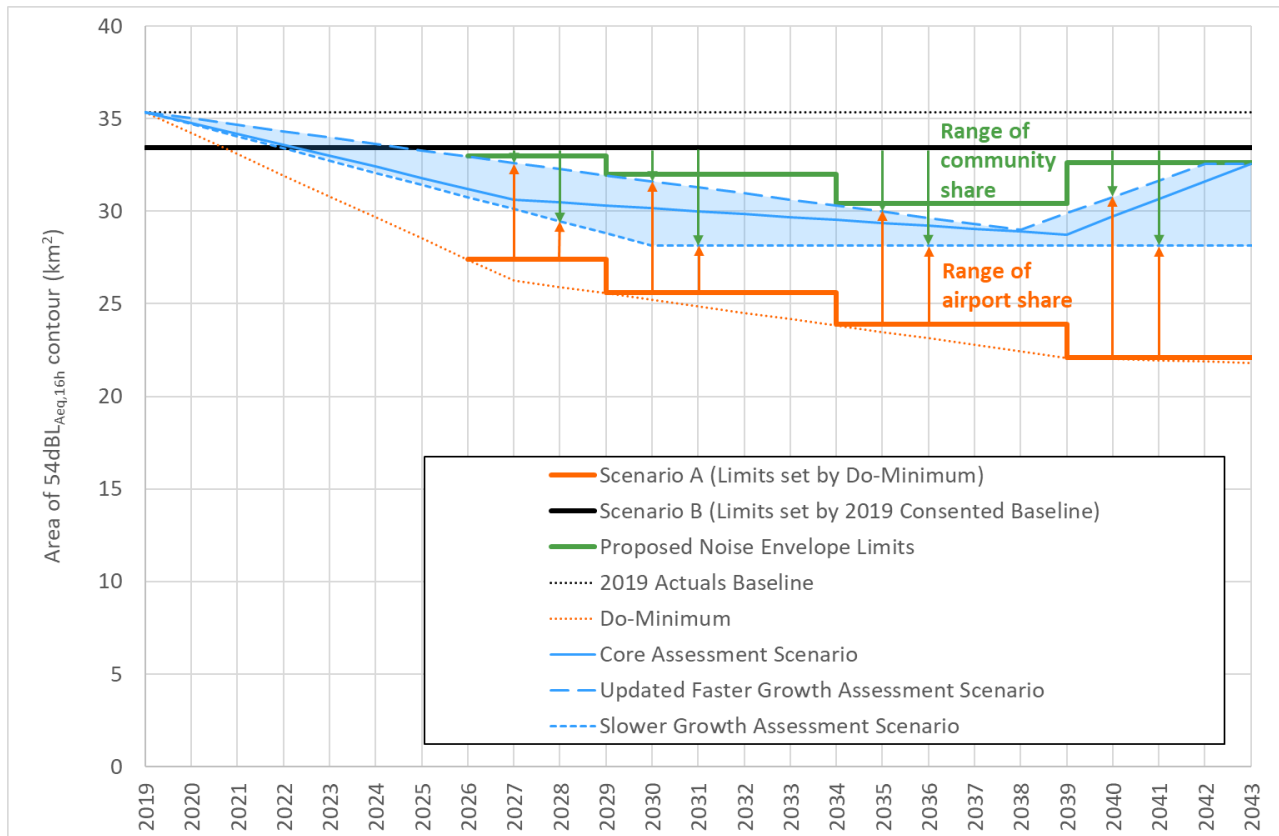
### Inset 3.1 Noise Envelope Limits and sharing the benefits, daytime



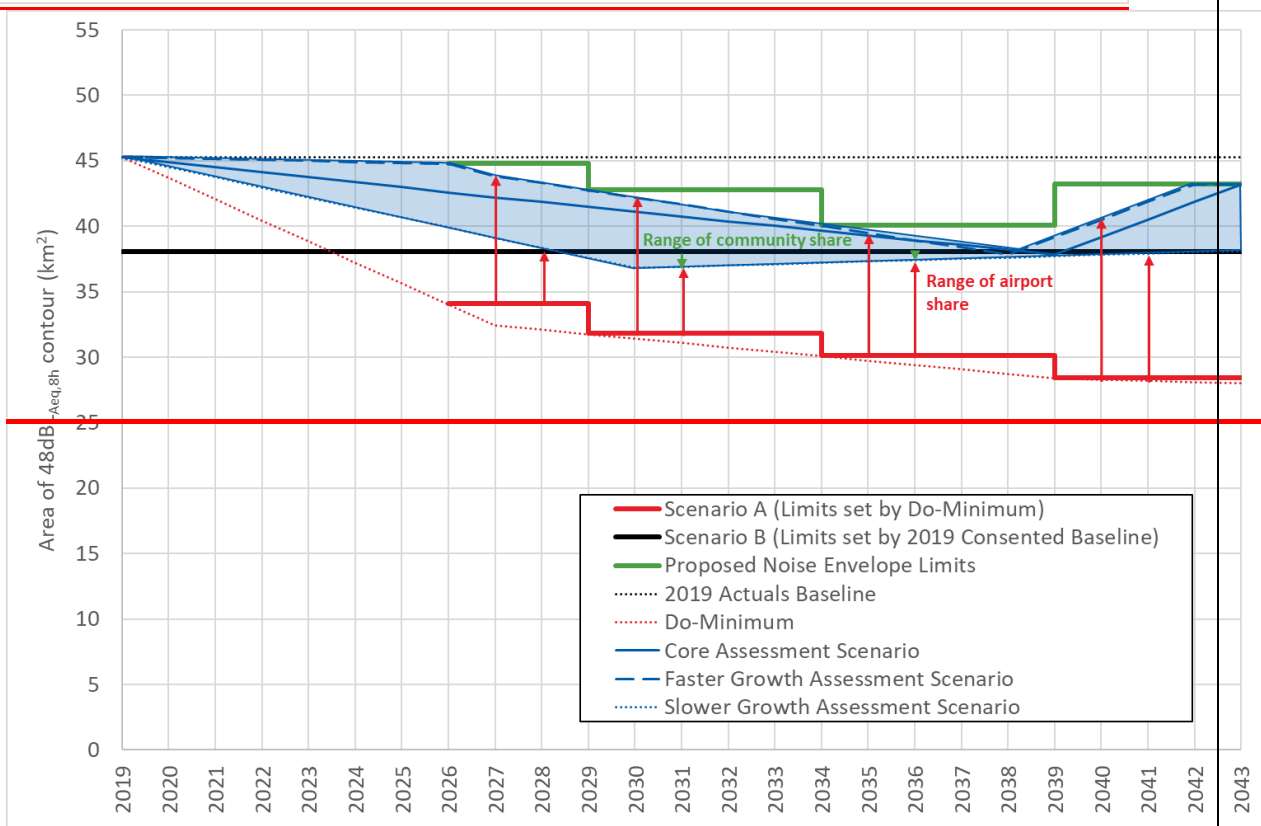
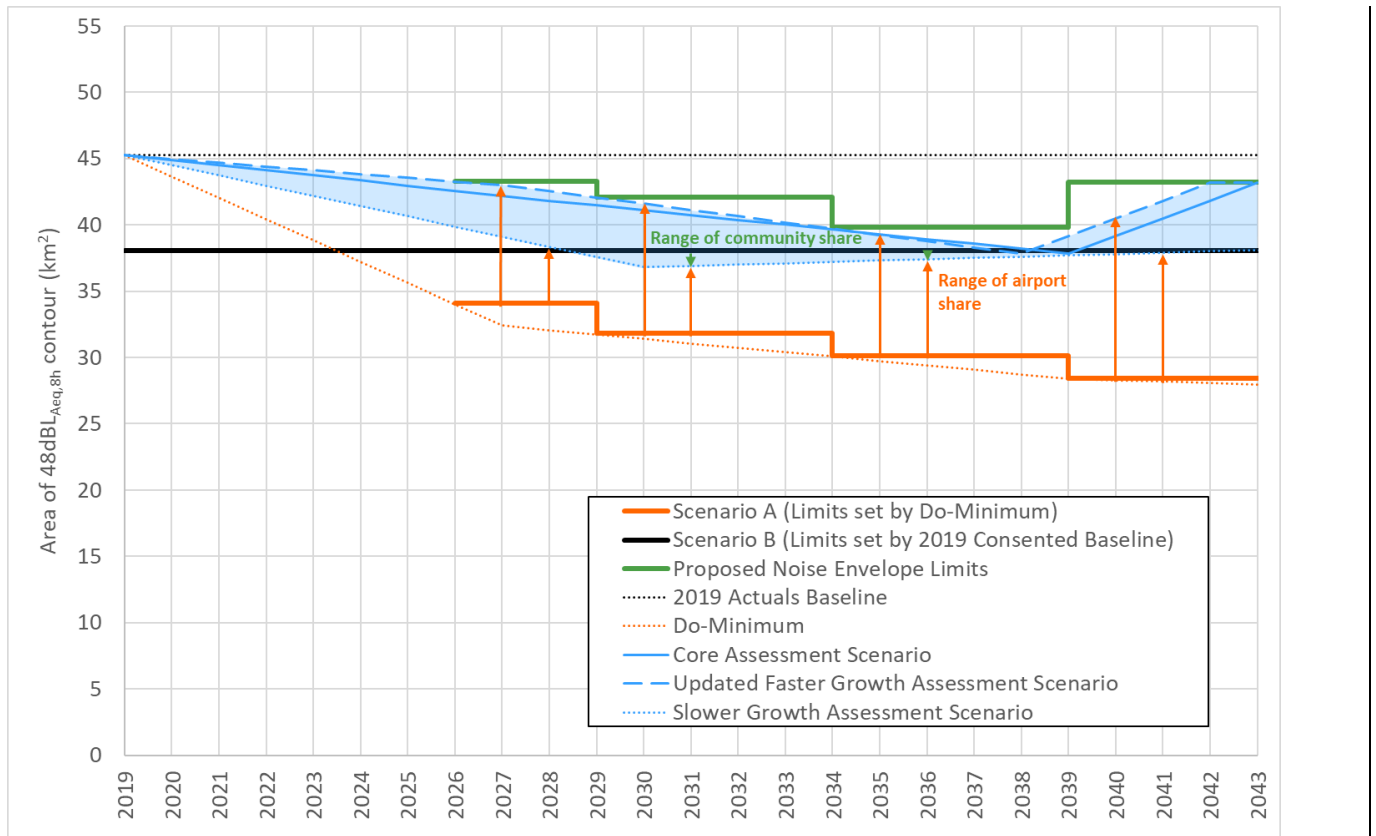
### Inset 3.2 Noise Envelope Limits and sharing the benefits, night-time



### Inset 3.3 Noise Envelope Limits and assessment scenarios, daytime



### Inset 3.4 Noise Envelope Limits and assessment scenarios, night-time



3.3.21 The range of percentage share that goes to the community in [Inset 3.3](#) [Inset 3.3](#) and [Inset 3.4](#) [Inset 3.4](#) is presented numerically in [Table](#)

~~3.2 Table 3.2~~ **Table 3.2** for daytime and ~~Table 3.3~~ **Table 3.3** for night-time.

Table 3.2 Percentage of noise contour reduction that goes to the community, daytime

Period	Area of 54dB <sub>L<sub>Aeq,16h</sub></sub> Contour (km <sup>2</sup> )				Percentage of noise contour reduction that goes to the community <sup>5</sup>
	Scenario A	Scenario B	Smallest forecast noise contour	Largest forecast noise contour (Noise Envelope Limit)	
Up to 2028	27.4	33.5	29.5	33. <del>06</del>	<del>0-7</del> – 66%
2029 – 2033	25.6	33.5	28.2	32. <del>08</del>	<del>8-18</del> – 68%
2034 – 2039	23.9	33.5	28.2	30. <del>47</del>	<del>29-32</del> – 55%
2039 – 2043	22.1	33.5	28.2	32.6	7 – 47%

Table 3.3 Percentage of noise contour reduction that goes to the community, night-time

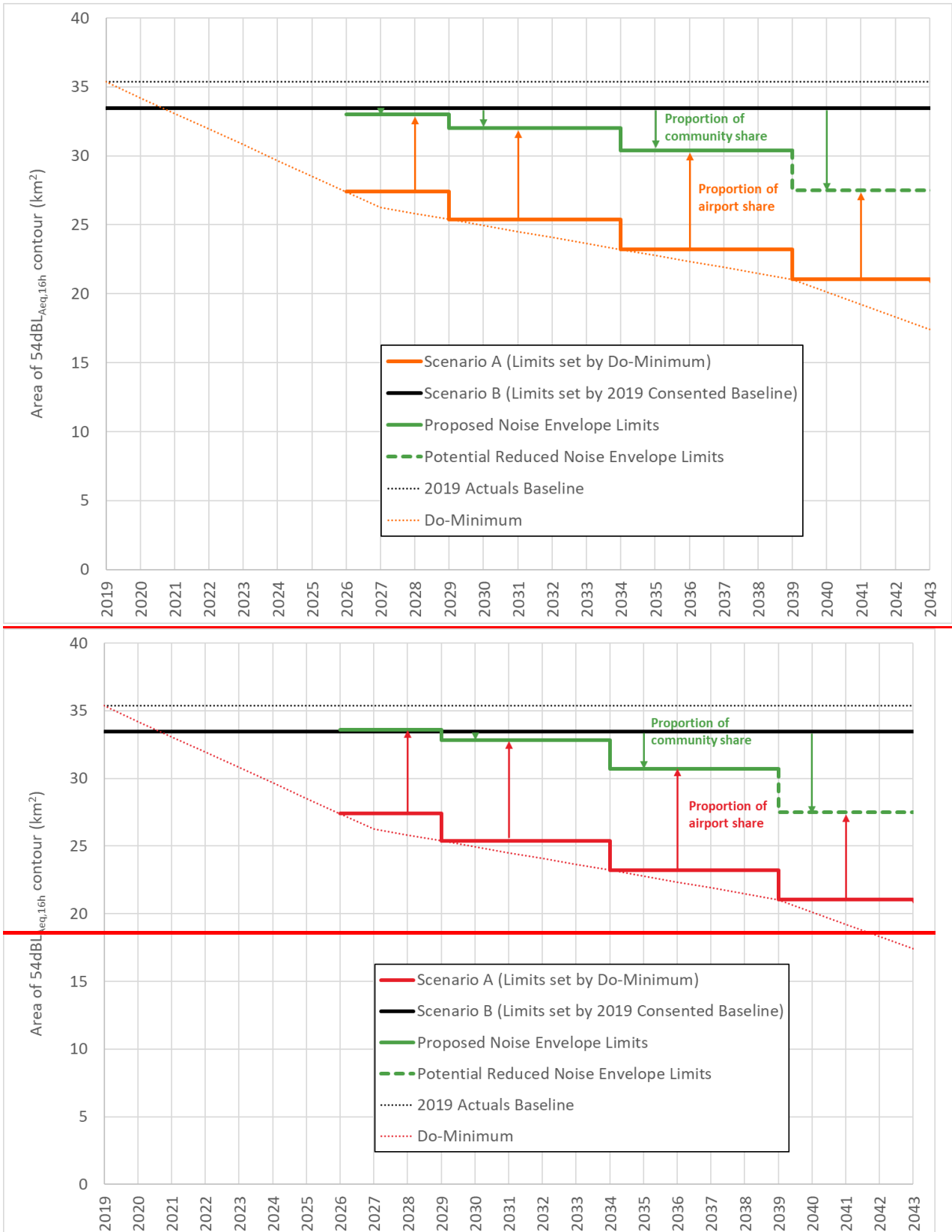
Period	Area of 48dB <sub>L<sub>Aeq,8h</sub></sub> Contour (km <sup>2</sup> )				Percentage of noise contour reduction that goes to the community <sup>5,4</sup>
	Scenario A	Scenario B	Smallest forecast noise contour	Largest forecast noise contour (Noise Envelope Limit)	
Up to 2028	34.1	38.0	38.3	44. <del>83</del>	0%
2029 – 2033	31.8	38.0	36.8	42. <del>81</del>	0 - 20%
2034 – 2039	30.1	38.0	37.2	<del>40</del> <del>39.18</del>	0 - 10%
2039 – 2043	28.4	38.0	37.7	43.2	0 - 3%

<sup>5</sup> The percentage range is calculated as a percentage of the difference between Scenario A and Scenario B for the largest and smallest forecast noise contours, e.g.  $(33.5 - 29.5)/(33.5 - 27.4) \times 100\% = 66\%$

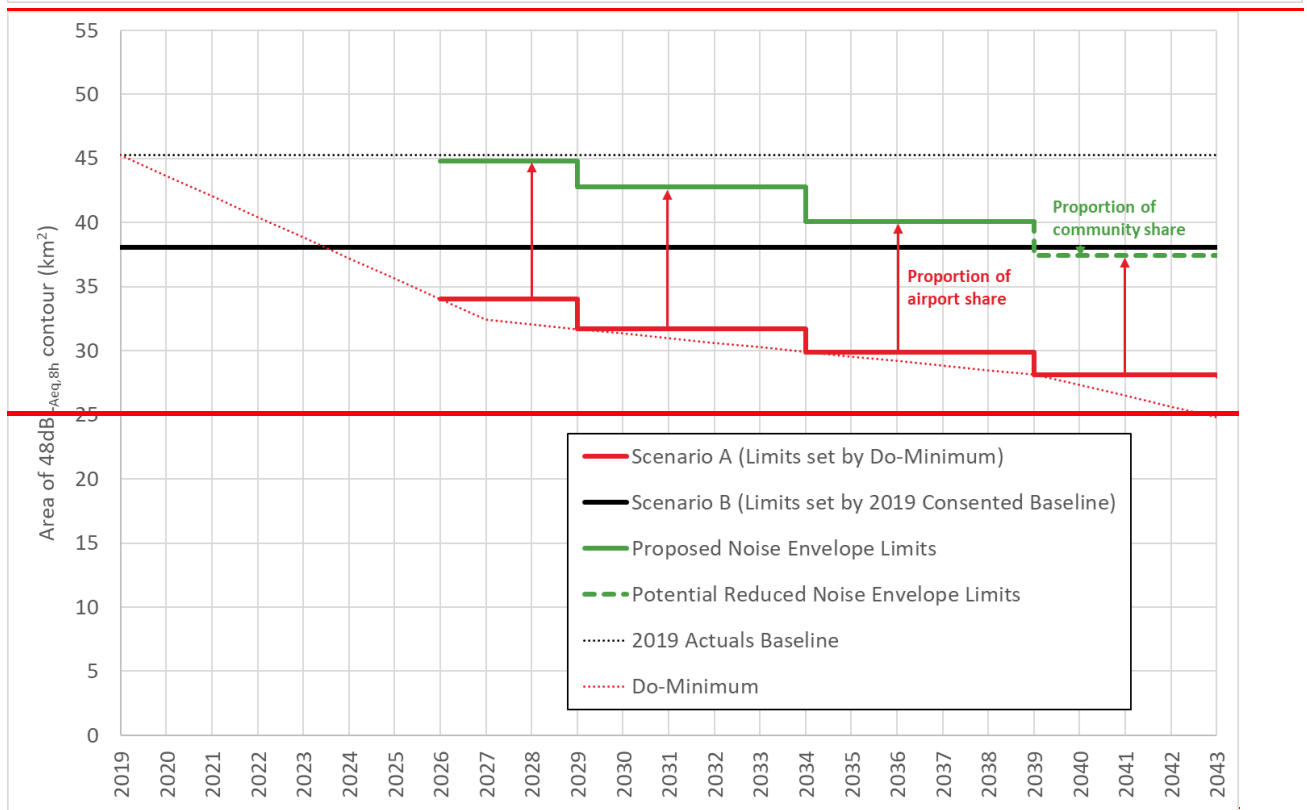
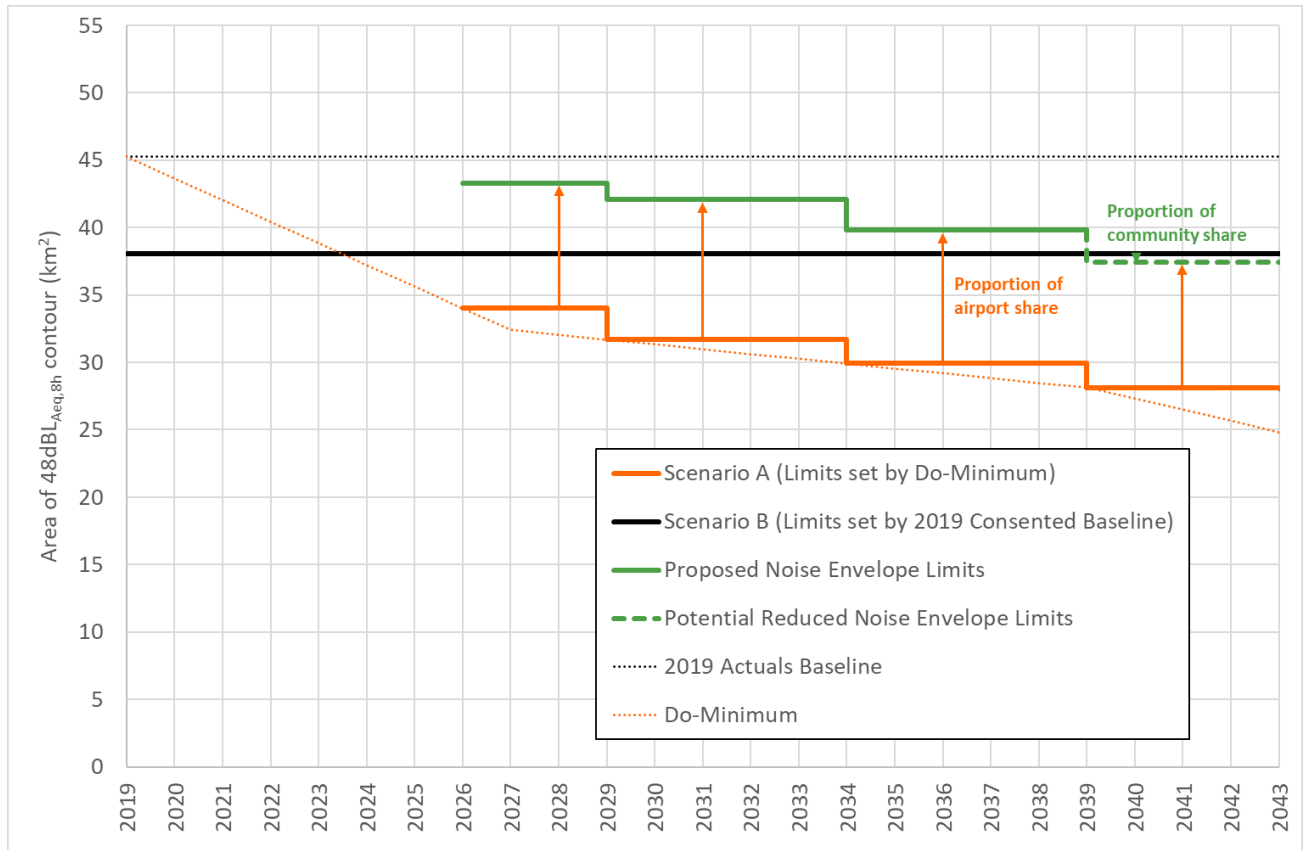
## An example of how the benefits of future 'next-generation' aircraft could be shared

- 3.3.22 A key feature of the Noise Envelope proposals within GCG is that the Noise Envelope Limits will be reduced in future years (beyond the 2030s) if and when quieter 'next generation' aircraft become available that would enable lower noise levels to be achieved and the benefits shared between the airport and communities. Whilst the noise benefit of next-generation aircraft cannot be known with any certainty at this stage, a sensitivity test of the potential benefit of next-generation aircraft has been undertaken and is presented in summary form in **Chapter 16** Noise and vibration of the ES [~~TR020001/APP/5.01d9-refREP1-003~~]. Further detail on the assumptions for the potential noise performance of next-generation aircraft and results of the sensitivity test are presented in **Appendix 16.1** Noise and Vibration Information of the ES [~~AS-096TR020001/APP/5.01d9-ref~~].
- 3.3.23 The results of this sensitivity test have been used to demonstrate how the Noise Envelope Limits could be reduced in future years if next-generation aircraft continue to get quieter, resulting in a greater proportion of the benefit sharing going to the community. This is illustrated in ~~Inset 3.5~~~~Inset 3.5~~~~Inset 3.5~~ for daytime and ~~Inset 3.6~~~~Inset 3.6~~~~Inset 3.6~~ for night-time. With this potential reduced Noise Envelope Limit, the percentage of noise contour reduction that goes to the community would be **48%** during the daytime and **6%** during the night-time in the 2039 – 2043 period. The noise contours used to derive these reduced Noise Envelope Limits are presented in **Figure 16.101** for daytime and **Figure 16.102** for night-time [~~TR020001/APP/5.03AS-119~~].

### Inset 3.5 Potential reduced Noise Envelope Limits due to next-generation aircraft, daytime



### Inset 3.6 Potential reduced Noise Envelope Limits due to next-generation aircraft, night-time





## 4 ADDITIONAL AIR NOISE CONTROLS

4.1.1 Following discussion at the Issue Specific Hearings in September 2023, further discussions with the Host Authorities and the decision to approve the airport operator's P19-application for 19 mppa ('P19') (21/00031/VARCON), the Applicant submitted an Air Noise Management Plan [TR020001/APP/8.125d9 ref] to secure the continuation of the following additional noise controls that are compatible with the growth sought by the DCO:

- a. a movement limit of 9,650 during the Night Quota Period (23:30 – 06:00)<sup>6</sup>;
- b. a QC limit of 3,500 during the Night Quota Period (23:30 – 06:00);
- c. a ban on QC2 aircraft or above during the full night period (23:00 – 07:00);
- d. track violation penalties; and
- e. departure Noise Violation Limits.

4.1.2 Whilst, as discussed in Issue Specific Hearing 3, it was anticipated that these controls would have been maintained through the airport operator's Noise Action Plan, the Air Noise Management Plan [TR020001/APP/8.125d9 ref], which is secured by a Requirement to the DCO, provides certainty that these controls will be maintained.

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<sup>6</sup> This restriction has been part of the proposed noise controls since DCO-submission of the application for development consent.

## **5 GROUND NOISE MANAGEMENT**

**5.1.1** Following discussion at the Issue Specific Hearings in September 2023, the Applicant submitted an **Outline Ground Noise Management Plan [TR020001/APP/8.46REP4-049]** to secure the continuation of the ground noise controls relating to:

- a. ground running of aircraft propulsion engines;**
- b. preferential use of stands and taxiways;**
- c. use of Auxiliary Power Units and Ground Power Units; and**
- d. ground run tests at night and locations for ground run test during the day.**

**5.1.2** Whilst, as discussed in Issue Specific Hearing 3, it was anticipated that these controls would have been maintained through the airport operator's Noise Action Plan, the adoption of a Ground Noise Management Plan which must be substantially in accordance with the **Outline Ground Noise Management Plan [TR020001/APP/8.46REP4-049]**, secured by a Requirement to the DCO, provides certainty that these controls will be maintained.

## 46 NOISE INSULATION

### 4.16.1 Air noise

**4.1.16.1.1** As part of the Proposed Development, the current air noise insulation scheme administered by London Luton Airport Operations Ltd (LLAOL) will be updated if development consent is granted. The updated noise insulation scheme improves on the current scheme and goes beyond the government proposals set out in Aviation 2050. The proposed residential noise insulation scheme sets a five-tiered scheme as follows:

- a. Scheme 1 – for residential properties inside the 63dB<sub>L<sub>Aeq,16h</sub></sub> contour, a full package of agreed noise insulation works to habitable rooms;
- b. Scheme 2 – for residential properties inside the 60dB<sub>L<sub>Aeq,16h</sub></sub> contour and outside the 63dB<sub>L<sub>Aeq,16h</sub></sub> contour, a contribution of up to £20,000 for agreed noise insulation works to habitable rooms;
- c. Scheme 3 – for residential properties inside the 55dB<sub>L<sub>Aeq,8h</sub></sub> contour and outside the 60dB<sub>L<sub>Aeq,16h</sub></sub> contour, a full package of agreed noise insulation works to bedrooms;
- d. Scheme 4 – for residential properties inside the 57dB<sub>L<sub>Aeq,16h</sub></sub> contour and outside the 60dB<sub>L<sub>Aeq,16h</sub></sub> contour, a contribution of up to £6,000 for agreed noise insulation works to habitable rooms; and
- e. Scheme 5 – for residential properties inside the daytime 54dB<sub>L<sub>Aeq,16h</sub></sub> contour and outside the 57dB<sub>L<sub>Aeq,16h</sub></sub> contour, a contribution of up to £4,000 for agreed noise insulation works to habitable rooms.

**4.1.26.1.2** Full details on the proposed noise insulation scheme and a new discretionary property compensation scheme are presented in **Compensation Policies, Measures and Community First** submitted as part of the application for development consent [[TR020001/APP/7.10d9\\_refREP2-005](#)]. The proposed compensation scheme will be secured through a **Requirement of the DCO Section 106 agreement**.

**4.1.36.1.3** All properties experiencing a significant effect on health and quality of life (i.e. noise levels exceeding the SOAEL) due to aircraft noise are eligible for a fixed contribution towards noise insulation under the current insulation scheme. The proposed noise insulation scheme offers a substantial improvement by offering a fully funded package of insulation for habitable rooms for properties within the daytime SOAEL noise contour and a fully funded package of insulation for bedrooms for properties within the night-time SOAEL. Additionally, properties outside the SOAEL contours and within the 54dB<sub>L<sub>Aeq,16h</sub></sub> noise contour will receive a contribution towards the cost of agreed noise insulation works.

**4.1.46.1.4** The rollout of the noise insulation scheme will begin with, and prioritise those, above the daytime and night-time SOAELs (i.e. Schemes 1 to 3). See **Compensation Policies, Measures and Community First** [[TR020001/APP/7.10d9\\_refREP2-005](#)] for more information on the rollout of the schemes.

**4.1.56.1.5** Full packages of insulation above the SOAEL are provided so that, in combination with the embedded noise management measures, the first aim of Government noise policy can be met, i.e. to avoid significant adverse effects on health and quality of life from noise within the context of Government policy on sustainable development. This approach to meeting the first aim of Government noise policy has been accepted for many large infrastructure projects (e.g HS2) and the approach has been tested in the in the Cranford Appeal decision (Ref. 10) which states at paragraph 1087 *“Against this background I consider that the proffered mitigation between SOAEL and UAEL is consistent with the APF and would be sufficient to avoid significant observed adverse effects.”*

## **4.26.2 Surface access noise**

**4.2.16.2.1** The assessment of noise from the Proposed Development presented in **Chapter 16** Noise and vibration of the ES [**TR020001/APP/5.01d9\_refREP1-003**] has identified the potential for indirect significant adverse effects, in 2039 and 2043, for specific properties on Crawley Green Road due to intensification of road traffic using existing public highways, where road traffic noise levels are expected to be above the SOAEL with the Proposed Development in place.

**4.2.26.2.2** Monitoring of airport trips will be undertaken on an annual basis with wider traffic surveys undertaken every 5 years to provide the information required to undertake forecast surface access noise modelling up to 5 years into the future at properties where an indirect significant adverse effect above SOAEL has been identified in **Chapter 16** Noise and vibration of the ES [**TR020001/APP/5.01d9\_refREP1-003**]. To account for any potential atypical night-time flows, the monitoring will collect sufficient data for Transport Research Laboratory Method 1 (Ref 11) to be employed for the stretch of Crawley Green Rd from Vauxhall Way to Hedley Rise. This monitoring and remodelling will be used to identify eligibility for noise insulation if required.

**4.2.36.2.3** For the purpose of the re-evaluation, changes in the expected Do-Minimum and Do-Something Basic Noise Level (BNL) for assessment Phase 2a and assessment Phase 2b will be calculated and the results of the assessment in **Chapter 16** Noise and vibration of the ES [**TR020001/APP/5.01d9\_refREP1-003**] updated accordingly<sup>7</sup>. Indirect significant effects would be identified at these properties if they exceed a road traffic noise level of 63dB  $L_{Aeq,16h}$  or 55dB  $L_{Aeq,8h}$  and experience a noise increase between the without development scenario (the Do-Minimum) and the with Proposed Development scenario (Do-Something) of 1dB or more, in either assessment Phase 2a or assessment Phase 2b.

**4.2.46.2.4** For properties in which a significant effect is confirmed through the updated modelling described above, a package of noise insulation to habitable rooms, including bedrooms, living rooms, and dining rooms would be offered with respect to the façade or facades that triggered the significant effect.

<sup>7</sup> This approach avoids potential inconsistencies arising from changes to noise modelling software or calculation methods in the period between the application and the revaluation.

6.2.5 See **Compensation Policies, Measures and Community First** [TR020001/APP/7.10d9-refREP2-005] for more information for this noise insulation scheme, including details of the rollout of the noise insulation if it is identified as being required.

### 6.3 **Ground noise**

6.3.1 The ground noise insulation scheme will apply to:

- a. Habitable rooms in residential properties exposed to free-field ground noise levels in excess of 55dB<sub>L</sub>Aeq,16h; and
- b. Bedrooms in residential properties exposed to free-field ground noise levels in excess of 45dB<sub>L</sub>Aeq,8h.

6.3.2 The insulation scheme will apply to rooms (as defined above) with windows in the elevation(s) of the property exposed to the ground noise source.

6.3.3 Each year, eligibility will be determined by modelling of ground noise from actual aircraft movements at the airport for the summer period (16 June to 15 September) in the immediately preceding calendar year.

6.3.4 The ground noise insulation scheme will provide a contribution of up to £4,500 for agreed noise insulation works to be undertaken to the property.

6.3.5 Where a property qualifies for both an aircraft noise and ground noise scheme this will be made clear to the owner and they will be given the option as to which scheme they want to apply.

~~4.2.56.3.6~~ 6.3.6 See **Compensation Policies, Measures and Community First** [TR020001/APP/7.10d9-ref] for more information for this noise insulation scheme.

## **57** FIXED PLANT NOISE MANAGEMENT

**5.1.17.1.1** This section describes the measures that will be put in place to manage noise from fixed plant. 'Fixed plant' covers the following systems associated with the Proposed Development:

- a. substations;
- b. fuel storage facilities;
- c. water treatment facilities;
- d. solar battery storage facilities; and
- e. mechanical, electrical and public health (MEP) systems serving the new terminal infrastructure.

**5.1.27.1.2** The level of design detail at the time of the ES for fixed plant is limited, as is normal for any project of this nature. The means of managing noise effects from fixed plant is therefore to avoid significant adverse effects and reduce adverse effects as far as is reasonably practicable by following a Fixed Plant Noise Management Plan derived from guidance in British Standard 4142. The Fixed Plant Noise Management Plan is presented in **Appendix 16.3** of this ES [**TR020001/APP/5.02APPREP4-112025**].

**5.1.37.1.3** Following the process described in the Fixed Plant Noise Management Plan will mean that:

- a. adverse effects of noise from fixed plant are reduced as far as is reasonably practicable in line with the second aim of Government noise policy to minimise adverse effects on health and quality of life in the context of sustainable development; and
- b.** significant adverse effects are avoided (by specifying noise limits so as not to exceed a rating level of 5dB or more above the background sound level) in line with the first aim of Government noise policy to avoid significant adverse effects on health and quality of life.

## GLOSSARY AND ABBREVIATIONS

<b>Term</b>	<b>Definition</b>
ACP	Airspace Change Proposal
ANC	Association of Noise Consultants
ANPS	Airports National Policy Statement
APF	Aviation Policy Framework
CAA	Civil Aviation Authority
DCO	Development Consent Order
END	Environmental Noise Directive
ES	Environmental Statement
FASI-S	Future Airspace Strategy Implementation – South
FTTF	Flightpath to the Future
GCG	Green Controlled Growth
ICCAN	Independent Commission on Civil Aviation Noise
LADACAN	Luton And District Association for the Control of Aircraft Noise
LLAOL	London Luton Airport Operations Ltd
LOAEL	Lowest Observed Adverse Effect Level
MEP	Mechanical, Electrical and Public Health
NAP	Noise Action Plan
NPS	National Policy Statement
NE	Noise Envelope
NEDG	Noise Envelope Design Group
NPSE	Noise Policy Statement for England
PPGN	Planning Practice Guidance Noise
SOAEL	Significant Observed Adverse Effect Level

# ANNEX A – NOISE ENVELOPE DESIGN GROUP FINAL REPORT



**Luton Rising**

**Application for Development Consent**

**Report from the**  
**Noise Envelope Design Group**

**December 2022**

**Document Control:**

Title: **Report from the Noise Envelope Design Group (NEDG)**

Author **Stephen Turner – Independent Acoustics Consultant  
on behalf of the NEDG**

Checked by **Martin Routledge – Independent Chair of the NEDG**

Approved by **The Noise Envelope Design Group<sup>1</sup>**

**Version History**

17 November 2022	First Draft
13 December 2022	Final Draft
19 December 2022	Issue Version

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<sup>1</sup> Whereas, for the most part, there was unanimity amongst the NEDG regarding the contents of this report, in some cases, there was disagreement. Where such disagreements existed, these are highlighted in the report

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## Introduction

1 Luton Rising (LR) is developing proposals for the expansion of London Luton Airport (LLA). Under the Planning Act 2008, the proposed development is of a size and nature that means it is a Nationally Significant Infrastructure Project and the merits of the scheme will be considered through the Development Consent Order (DCO) process.

2 The application needs to take account of various policy documents including the Airports National Policy Statement, published by the Government in 2018. Paragraph 5.60 states that:

*The applicant should put forward plans for a noise envelope. Such an envelope should be tailored to local priorities and include clear noise performance targets. As such, the design of the envelope should be defined in consultation with local communities and relevant stakeholders, ...*

3 LR established the Noise Envelope Design Group (NEDG) in response to the requirement to consult with local communities and relevant stakeholders when developing the design of the Noise Envelope (NE).

4 The NEDG was established in October 2019 and met ten times<sup>2</sup> before the publication of the Group's Interim Report in October 2020<sup>3</sup>.

5 The COVID pandemic and associated lockdowns disrupted progress and it was not until 13<sup>th</sup> July 2021 that the NEDG met again. Seven further meetings were held, culminating in a meeting on 21<sup>st</sup> November 2022 when a final draft of this report was presented to the NEDG. Members were given a further two weeks to provide any further observations.

6 Comments were received from members representing General Aviation, the Host Authorities, the Community, and the Airport Operator. The comments from the General Aviation and Host Authorities were mainly confined to minor drafting suggestions and typographical points. More substantive commentaries were received from the Community and the Airport Operator (see Conclusions)

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<sup>2</sup> The COVID pandemic disrupted the meetings of the NEDG from March 2020, with the work going on line

<sup>3</sup> Future LuToN DCO: Recommendations of the Noise Envelope Design Group – Interim Report – 9<sup>th</sup> October 2020

### NEDG Recommendations in the Interim Report

7 For ease of reference, the NEDG's Interim Report<sup>3</sup> is attached at Appendix A. At Section 4 of that report, the Group advised that the following controls should be included in the Noise Envelope:

- **Limits:** These would be enforceable limits whereby if they are exceeded, the appropriate enforcing body would be able to take enforcement action against the airport;
- **Thresholds:** These would be values set proportionally below the corresponding limit values using the same indicators as those used to define the limits. If any of these thresholds are exceeded, the Airport Operator would be required to provide a detailed explanation to the enforcing body of the reasons why the threshold had been exceeded. Furthermore, the Airport Operator would also need to define and implement a remedial action plan to demonstrate how it would manage its operations so that the corresponding limit value is not exceeded.
- **Management Targets:** The NEDG were concerned that the checking of the airport's noise management performance against the Limits and Thresholds would be inevitably retrospective. Consequently, the NEDG was of the view that there needed to be a mechanism using other indicators to monitor the airport's noise impact on a more frequent basis. If those indicators suggested that a threshold or limit might be exceeded, action could be taken more quickly to try to avoid that exceedance occurring. To that end, the NEDG proposed a third level of control described as Targets. The NEDG suggested that Quota values could be used, with the Targets set to correspond with what they would have to meet so that the Threshold and Limits were not exceeded<sup>4</sup>.

8 The NEDG felt that this approach met Government's policy on Noise Envelopes, set out in the Aviation Policy Framework<sup>5</sup> at Paragraph 3.29 where it states:

*The Government wishes to pursue the concept of noise envelopes as a means of giving certainty to local communities about the levels of noise which can be expected in the future and to give developers certainty on how they can use their airports.*

9 Furthermore, the NEDG felt that the values used for limits and thresholds should evolve over time to reflect the development of the airport.

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<sup>4</sup> See Section 2.4 of the Interim Report

<sup>5</sup> Aviation Policy Framework, DfT, 2013

- 10 The NEDG recommended that following indicators be included in the Noise Envelope. The figure in parentheses indicates the suggested value of the threshold associated with the limit:
- Area enclosed by the 54 dB,  $L_{Aeq,16h}$  summer average day contour (85%);
  - Area enclosed by the 48 dB,  $L_{Aeq,8h}$  summer average night contour (85%);
  - Total number of Air Transport Movements as a 12-month rolling average in the night-time quota period<sup>6</sup> (90%);
  - Total annual Quota as a 12-month rolling average in the night-time period<sup>7</sup> (90%);
  - Total number of Air Transport Movements as a 12-month rolling average (90%); and
  - Departure Noise Violations Limits at the current monitoring locations, but graduated according to the certificated departure noise performance of the different aircraft types<sup>8</sup>.
- 11 The NEDG also felt that the Airport Operator should regularly report on other indicators in order to provide a fuller picture of the noise impact of the airport's operations. Such reporting should be either quarterly or annually, depending on the indicator. The additional indicators identified were:
- Noise contours in increasing 3 dB bands starting at 51 dB  $L_{Aeq,16h}$ ;
  - Noise contours in increasing 3 dB bands starting at 45 dB  $L_{Aeq,8h}$ ; and
  - The contour for the 55dB  $L_{Aeq,8h}$  which represents the night-time SOAEL value being used by Luton Rising<sup>9</sup>.

These contours are to be produced for the following situations:

- Summer average (based on a fixed standard modal split);
- Summer average (based on actual modal split);
- Summer average, single mode operations;
- Annual average (based on a fixed standard modal split);
- Annual average (based on actual modal split); and
- Annual average, single mode operations.

<sup>6</sup> 23.30 hours to 06.00 hours local time

<sup>7</sup> 23.00 hours to 07.00 hours local time

<sup>8</sup> This control measure is currently used, but currently has a single limit value for all aircraft types

<sup>9</sup> The SOAEL for daytime is 63 dB,  $L_{Aeq,16h}$  will naturally be produced as a result of the 3 dB bands being used

The NEDG also recommended that the following information be provided:

- Summer average day N65 contours;
- Summer average night N60 contours;

at the following values (where applicable)

- 25, 50, 100, 200, 400.

For all the contours, the NEDG recommended that information about the area, the number of households and the population enclosed by the various contour bands be provided.

- 12 It can be seen from the Interim Report that Luton Rising had put forward some ideas regarding how the Noise Envelope would be enforced. The NEDG noted that LR were developing the concept of Green Managed Growth involving some enforcement function by an independent body, and that this body might also be the basis for enforcing the terms of the Noise Envelope.
- 13 The Interim Report also included a recommendation from the NEDG that a regular review of the Noise Envelope would be necessary. The NEDG felt that the Group should be reformed every five years to discuss the potential need for any changes to the Noise Envelope.
- 14 The NEDG also recommended that the Noise Envelope should be reviewed if there were to be any significant changes to the airport's operations. Such a change might include the anticipated modernisation of airspace.

### NEDG Meetings since the publication of the Interim Report

15 As mentioned in Paragraph 5 above, seven meetings of the NEDG have been held since the publication of the Interim Report. These occurred on:

13<sup>th</sup> July 2021;

8<sup>th</sup> November 2021;

7<sup>th</sup> December 2021;

14<sup>th</sup> September 2022;

12<sup>th</sup> October 2022;

28<sup>th</sup> October 2022;

21<sup>st</sup> November 2022

16 The same stakeholders were invited to these meetings as those listed in Paragraph 1.4 of the Interim Report. All the meetings were held on-line, initially because of Health and Safety concerns, but latterly due to convenience.

17 The attendees at the various meetings are summarised in Table 1 below

**Table 1**

**Attendees at NEDG meetings since the publication of the Interim Report**

Date	Project Team	Airport Operator	Airlines <sup>10</sup>	Local Authority (including advisors)	Resident Groups	Independent Chair and Advisor
13 <sup>th</sup> July 2021 <sup>11</sup>						
8 <sup>th</sup> November 2021	6	1	1	4	1	1
7 <sup>th</sup> December 2021	7	1	0	5	1	2
14 <sup>th</sup> September 2022	8	1	2	6	1	2
12 <sup>th</sup> October 2022	6	1	2	5	1	2
28 <sup>th</sup> October 2022	7	1	1	4	1	2
21 <sup>st</sup> November 2022						

<sup>10</sup> Including General Aviation

<sup>11</sup> The record of this meeting is unavailable



18 The key issues discussed at each meeting in relation to the design of the Noise Envelope are summarised below:

**13<sup>th</sup> July 2021**

19 LR described how it was proposed to include the Noise Envelope as part of the Green Managed Growth approach to controlling the environmental impacts of the Airport.

**8<sup>th</sup> November 2021**

20 There had previously been two Resident Groups representatives on the NEDG. One of those representatives had left the Group and the other sought to have another resident voice at the table. The chair felt that at such a late stage in the process it would be difficult to bring in another community voice, but if the group were retained [after the completion of the current work] then another resident representative (who would speak for an area away from Hertfordshire and the South-West departure route) could be a sensible way forward.

21 With reference to the various indicators described in Paragraph 9 above, the Chair indicated that for the NEDG to complete its work, limit and threshold values would need to be defined for the various noise metrics. The Chair also re-affirmed the importance of any enhancements or improvements [in technology] being shared between the community and the industry. Furthermore, it would be necessary to define how the shared approach would be delivered.

**7<sup>th</sup> December 2021**

22 LR presented possible limit and threshold values based on the noise modelling set out in the Preliminary Environmental Information Report. The proposed control measures were described, as well as how the Noise Envelope would fit with the Green Controlled Growth (GCG)<sup>12</sup> process.

23 There was further discussion about the practicalities of the Airport Operator being able to react in time to potential exceedances of the Threshold and, consequently, avoiding breaching the Limit value. The Airport Operator indicated that it favoured the emphasis being on Quota Limits as the means of control.

24 Conversely, LR proposed that the Noise Envelope limit be confined to the summer average day and night contours. The Resident Group representative was concerned that the Threshold and Limit could be exceeded in one season.

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<sup>12</sup> Formerly known as Green Managed Growth

- 25 The use of Forecast modelling was discussed as a means of exercising control.
- 26 LR stated that they would be providing an indication of the expected noise impact from the airport as expansion progressed and how the noise limits would vary accordingly. There would be a range of outcomes depending both on the assumptions made and what actually occurred.
- 27 LR also described the proposed Governance of the GCG and Noise Envelope and how the implementation of both would be monitored. An Environmental Scrutiny Group (ESG) would be established, independent from LR and the Airport Operator. The ESG role would be to manage the process and confirm whether or not the various thresholds and limits were being met.
- 28 This approach was set out in the Statutory Consultation on the Preliminary Environmental Information Report which occurred between February and April 2022. The nine-month gap between meetings of the NEDG resulted from the need of the Project Team to review the consultation responses.

***14<sup>th</sup> September 2022***

- 29 LR presented details of the GCG and how the Noise Envelope would interact with it. This included the proposed independent oversight of the ESG. A more detailed timeline was given regarding how the Noise Envelope Limits would evolve and when reviews might take place.

***12<sup>th</sup> October 2022***

- 30 LR explained that they were finalising the GCG /Noise Envelope document to enable the NEDG to express their view on it. There was some concern expressed by the NEDG over the proposed timetable for commenting on the draft due to the participation of some members of the NEDG in a forthcoming Public Inquiry.
- 31 LR also presented information on how they saw the principle of sharing the benefits working.
- 32 The Resident Group representative noted that all the documents circulated to the NEDG were 'In confidence'. That representative now sought permission to circulate the various documents to others in the community 'in trusted confidence'. The Chair confirmed that Resident Group representative could have conversations with others without breaching the NEDG confidentiality principles so that community views are properly represented. LR's lawyer would provide a response to this request in writing.

**28<sup>th</sup> October 2022**

- 33 It was confirmed that the LR had provided the requested response to the Resident Group representative.
- 34 LR described the proposed GCG/Noise Envelope and the associated Noise Monitoring Plan. Compared to the previous iteration, LR noted that the forthcoming Airspace Change could be a mechanism for reducing the noise limits, if the change reduces the noise impact.
- 35 The NEDG noted that only one type of noise indicator would be formally part of the Noise Envelope (the summer average day  $L_{Aeq,16h}$  and the summer average night  $L_{Aeq,8h}$ ). LR responded that the other metrics set out in the NEDG's Interim Report (see Paragraph 9 above) would be included in the Noise Monitoring Plan.
- 36 The NEDG also questioned where the 9650 Air Transport Movement limit for the night-time quota period would be stipulated, given that LR had already said this limit would remain. LR confirmed that this would be a separate requirement in the DCO and not part of the Noise Envelope.
- 37 In response to a further query from the NEDG, LR confirmed that all the recommendations made by the NEDG in the Interim Report regarding indicators to be monitored to assist with the noise management of the Airport would be part of the Noise Monitoring Plan.
- 38 It was also at this meeting that the NEDG agreed that Stephen Turner, Independent Acoustics Consultant, would provide the first draft of this final report.

## Issues

39 One of the challenges faced by the NEDG was differentiating between the need to focus on the structure, content and processes that might form the Noise Envelope from the broader issues concerning the proposed development. Inevitably in order to understand fully how the Noise Envelope might work, it was necessary to consider some detailed matters such as forecasting and noise model validation. Whilst those issues are very important, this report has tried to focus on the discussions surrounding the Noise Envelope design.

### ***The Noise Envelope and GCG***

40 Whilst the NEDG recognises the attraction of embedding the Noise Envelope in the GCG, there is a case for the Noise Envelope to be a discrete entity. To have a Noise Envelope is a requirement of Government Policy whereas the GCG is an initiative of Luton Rising. Furthermore, it would no doubt assist the Examining Authority and the Secretary of State for Transport to see clearly that the policy requirement regarding a Noise Envelope has been met by having a single document with that title.

### ***New Generation and Next Generation Aircraft***

41 LR provided a helpful distinction between New Generation and Next Generation Aircraft. New Generation aircraft already exist but have yet to replace fully the current fleet. Therefore, even without the expansion, the noise impact would be expected to reduce.

42 Next Generation do not yet exist and there is no information on the extent they will be less noisy than the New Generation aircraft. LR noted that whilst it is hoped that the for Next Generation aircraft would be less noisy, it is recognised that the main design demand of Next Generation aircraft is low carbon and low emissions. That may mean that the Next Generation aircraft will not be less noisy.

### ***The meaning of Sharing the Benefit***

43 At first blush, the meaning of sharing the benefit is clear. Previously when there had been a noise limit expressed in terms of the area enclosed by a noise contour, any future reductions in the noise generated by aircraft would mean that the airport could operate more aircraft movements and still remain within that limit. This would mean that all the benefit of the less noisy aircraft would go to the industry.

- 44 The clear policy requirement associated with a Noise Envelope means that such future benefit must be shared<sup>13</sup>.
- 45 The NEDG was keen to note that the policy refers to ‘technological improvements’ and these may manifest themselves in more than simply future individual aircraft being less noisy than the current generation. The NEDG do note that LR mentioned that the forthcoming airspace change may reduce the noise impact which could mean the noise limits reducing. The NEDG recommend that wherever technology assists in reducing the noise impact, the principles of sharing the benefit through the Noise Envelope should apply.
- 46 A second issue concerns the factors to be considered when sharing the benefit. It can be deduced that when first devised by Government, the benefit being considered was simply a reduced noise impact. The policy also mentions future growth as a factor. Furthermore, the overriding Government policy requires a balance to be struck between the negative impacts of noise and the positive economic (and social) benefits of flights.
- 47 Discussions did take place about how such sharing might occur and these various factors taken into account. However, whilst there was an indication that when technological improvements do transpire there would be an equal sharing of benefit (i.e. 50/50), this has not been clearly set out.
- 48 Notwithstanding the outcome of other Public Inquiries on this issue, the NEDG feel that any benefits should be equally shared. Just because there has been a definition of sharing elsewhere does not mean that LR has to follow that precedent in this case.
- 49 Finally, given there will be benefits from the continued introduction of New Generation aircraft into the fleet at the airport, the NEDG expects that the benefit of those aircraft will be shared if the Development Consent Order is granted, rather than waiting to see if any benefits accrue from, for example, Next Generation aircraft.<sup>14</sup>

### ***The Noise Indicators covered by the Noise Envelope***

- 50 As noted in Paragraph 23 above, LR are proposing that only the summer average day and night contours be included in the noise envelope. In the NEDG Interim Report, it was recommended that four other indicators should form part of the Noise Envelope (paragraph 9 above).

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<sup>13</sup> For example, the Aviation Policy Framework Paragraph 3.3

<sup>14</sup> Although the requirement to produce a Noise Envelope appears in the Airports Noise Policy Statement, there is an implication that the principles of sharing the benefit of technological improvements should apply to all airports regardless of whether there are any expansion plans associated with them

51 The NEDG believes that such an approach is fully justified. Firstly, within the Noise Envelope, confining the limits to the summer period means that there are no controls within the Noise Envelope for the rest of the year.

52 Furthermore, in its report on Noise Envelopes<sup>15</sup>, it was stated that

*the Government recognises that people do not experience noise in an averaged manner and that the value of the Leq indicator does not necessarily reflect all aspects of the perception of aircraft noise.*

and

*A contour limit may therefore be supplemented by a limit(s) that reflects other key aspects of this perception.*

53 Given that, the NEDG feel that there should be more indicators in the Noise Envelope and that the limits associated with them should reduce<sup>16</sup> in order to share the benefits of future technological improvements as they occur.

### ***Review Period***

54 The NEDG support the proposal that the formal review period should be every 5 years, aligning with the Airport's obligation to update its Noise Action Plan following the 5 yearly Noise Mapping required under the Environmental Noise (England) Regulations 2006 (as amended).

55 The NEDG also recommends that the Noise Envelope should be reviewed if there were to be any significant changes to the airport's operations. Such a change might include the anticipated modernisation of airspace.

### ***Environmental Scrutiny Group (ESG) and Enforcement***

56 The NEDG welcomes the proposals for an independent group that will hold the Airport to account with regard to its environmental performance. The concept of setting up specialist technical panels who would feed into the ESG is supported. The key issue, though, is the certainty that the ESG would have the necessary authority to prevent the Airport from exceeding the prescribed limits. To make the Noise Envelope meaningful and effective, this aspect has to be legally watertight.

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<sup>15</sup> CAP 1129 – Noise Envelopes (CAA 2013)

<sup>16</sup> Depending on the suite of indicators used in the Noise Envelope, the NEDG recognise that not all will necessarily be suitable for reducing as part of the sharing process

- 57** The NEDG noted that there had been some breaches of current noise limits at the airport in recent years. It suggested that LR might show how these breaches would not have occurred had the Noise Envelope process already been in place. At the time of writing, the outcome of this work had not yet been reported to the NEDG.

## **Conclusions**

- 58 This report presents the final outcome of the deliberations of the NEDG with regard to the proposed design of the Noise Envelope associated with the proposed expansion of London Luton Airport. It has summarised the discussions held since the publication of the Groups' Interim Report in 2020 and has included recommendations and comment on the emerging proposals from Luton Rising.
- 59 Almost inevitably, whilst there was a consensus amongst the members of the NEDG on some of the issues concerning the design of the Noise Envelope, there was not total agreement. In order to enable the positions of the various members to be clear, the brief statements below have been supplied by those members.

### ***Airlines, including General Aviation***

- 60 The Business Aviation/GA Community supports the content of this report, which largely takes into account the views expressed by the sector representative during the workings of the NEDG.

### ***Host Authorities***

- 61 The host authorities agree that the principles set out within this report are fair and reasonable. The host authorities particularly note that any noise envelope must include the full range of indicators set out in section 10 of this report. They also point out the need for the ESG to be independent and to be legally watertight, to enable meaningful and effective management, and for it to be demonstrated how previous breaches would have been avoided using the proposed processes, as set out in this report.

### ***Community Groups***

- 62 See Appendix B

### ***Airport Operator***

- 63 See Appendix C

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## **Appendix A**

### **NEDG Interim Report**

# **Future LuToN DCO**

## **Recommendations of the Noise Envelope Design Group**

### **Interim Report**

**9 October 2020**

## Document Control

### Document Properties

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08/01/2020	P01.02	Draft	Updated template shared with NEDG for comment
04/08/2020	P01.03	Draft	Draft Interim Report for NEDG comment
20/08/2020	P01.04	Draft	Updated draft Interim Report for NEDG comment
11/09/2020	P01.05	Draft	Updated following comments from NEDG members
22/09/2020	P01.06	Draft	Final draft following NEDG Meeting
09/10/2020	P01.07	Draft	Final draft issued to NEDG for sign off prior to submission to LLAL

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## Glossary

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AECOM	AECOM Ltd – Acoustic Consultants to LLAL
AEDT	Aviation Environmental Design Tool (aircraft noise modelling software)
ATC	Air Traffic Control
ATM	Air Traffic Movement
AVDC	Aylesbury Vale District Council (Buckinghamshire Council after 01/04/2020)
BBC	Bedford Borough Council
BCC	Buckinghamshire County Council (Buckinghamshire Council after 01/04/2020)
BDBP	BDB Pitmans – Lawyers to LLAL
BDT	Busy day timetable
CAA	Civil Aviation Authority
CBC	Central Bedfordshire Council
CCA	Climate Change Act
CJ	Cole Jarman (Consultant to the four host authorities on Acoustics, Noise & Vibration)
dB	Decibel (a unit to measure the level of sound)
DCO	Development Consent Order
DfT	Department for Transport
DHL	DHL Global Forwarding (Air Freight LTN)
EA	Environment Agency
EIA	Environmental Impact Assessment
EJ	easyJet
END	The Environmental Noise Directive (Directive 2002/49/EC of the European Council, relating to the assessment and management of environmental noise.
HCC	Hertfordshire County Council
ICCAN	Independent Commission on Civil Aviation Noise
INM	Integrated Noise Model (historic noise aircraft modelling software)
ISP	Independent Scrutiny Panel
LADACAN	Luton and District Association for the Control of Aircraft Noise

L <sub>Aeq,8 hr</sub>	Average equivalent continuous sound pressure level over an 8-hour period (23:00-07:00). This indicator refers to an average value across the summer (mid-June to mid-September) period.
L <sub>Aeq,16 hr</sub>	Average equivalent continuous sound pressure level over a 16-hour period (07:00-23:00). This indicator refers to an average value across the summer (mid-June to mid-September) period.
L <sub>ASmax</sub>	The maximum A-weighted sound pressure level, measured using the slow time constant.
L <sub>den</sub>	Average equivalent continuous sound pressure level over a 24-hour period, applying a 5 dB penalty to levels during the evening (19:00-23:00) and a 10 dB penalty to levels during the night (07:00-23:00). Calculated as an annual average over a complete year. This is a metric specifically reported under the END.
L <sub>night</sub>	Average equivalent continuous sound pressure level over an 8-hour night time period (07:00-23:00), as an annual average over a complete year. This is a metric specifically reported under the END.
LLATVCC	London Luton Airport Town & Villages Communities Committee
LOAEL	The Lowest Observable Adverse Effect Level
Modal split	The split between directions of operation of the runway. Typically this might be 70% westerly (using runway 26) and 30% easterly (using runway 08).
mppa	million passengers per annum
NATS	NATS Holdings (formerly National Air Traffic Services)
NEDG	Noise Envelope Design Group
NHDC	North Hertfordshire District Council
NC	Noise Contour
NE	Noise Envelope
NSIP	Nationally Significant Infrastructure Project
NVL	Noise Violation Limit
N <sub>x</sub>	The number of events exceeding a sound level of x dB L <sub>ASmax</sub> . N <sub>65</sub> is the number of aircraft movements resulting in a level of at least 65 dB L <sub>Amax</sub> at a given location.
LBC	Luton Borough Council
LLACC	London Luton Airport Consultative Committee

LLAL	Luton London Airport Limited
LLAOL	London Luton Airport Operations Limited
LTN	London Luton Airport
LPA	Local Planning Authority
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
QC	Quota Count
SACDC	St Albans City & District Council
SEL	Sound Exposure Level. This is a measure of the total sound energy within a single event, such as an aircraft overflight.
Single mode contours	Noise contours, based on a single mode of operation of the runway (i.e. assuming all flights use the runway in that single mode).
SOAEL	The Significant Observable Adverse Effect Level
SoS	Secretary of State
STA	Stephen Turner Acoustics Ltd (Independent Acoustics Consultant)
ToR	Terms of Reference
YAL	York Aviation LLP – Aviation Consultants to LLAL

# **1 FUTURE LUTON DCO NOISE ENVELOPE GROUP**

## **1.1 Introduction**

For airport developments which are Nationally Significant Infrastructure Projects (NSIPs), the Applicant is required to put forward plans for a Noise Envelope (NE), the envelope. The proposed expansion of London Luton Airport (LTN) is an NSIP and therefore a Noise Envelope needs to be defined and provided as part of the Development Consent Order (DCO) application.

The envelope needs to be tailored to local priorities and include clear noise performance targets. As such, it is necessary for the design of the envelope to be defined in consultation with local communities and relevant stakeholders and take account of any independent guidance. The Noise Envelope Design Group (NEDG), the Group, was established for this purpose and operated in accordance with the Terms of Reference set out in Appendix A.

## **1.2 The Noise Envelope**

The Noise Envelope is a legally binding framework of limits and controls to manage aircraft noise. It is the responsibility of the DCO Applicant – London Luton Airport Limited (LLAL) – to put forward the Noise Envelope proposals as part of the DCO application. Consequently, LLAL's DCO programme team have responsibility for developing and defining the envelope taking into consideration the advice and views provided by the NEDG.

The envelope is designed to protect communities whilst enabling the airport to operate efficiently and allow it to grow in accordance with the limits and thresholds defined by the envelope consented through the DCO. The overall aim of the envelope is to ensure future technological improvements are shared between communities, consumers and businesses during each stage of growth.

The envelope will provide certainty to the industry and communities about how noise will be managed to comply with Government policy; balancing growth and noise reduction, for the long term. The envelope is required to include a set of aims and principles, performance targets, evaluation criteria, the mitigation measures to be applied as considered necessary, and a review period.

## **1.3 Scope of the Noise Envelope Design Group**

The prime aim of the NEDG was to provide independent advice and assurance on the robustness of the assessment and mitigation of sound, noise and vibration, including effects on health and quality of life, associated with the proposed expansion of LTN. The NEDG advised on current best practice throughout the application process.

The Group aimed to ensure, in particular, that the Noise Envelope includes:



- clear and well-defined noise objectives;
- principles and priorities on which the Noise Envelope is based;
- enforceable limits;
- a method for evaluating noise control measures;
- a mechanism for sharing the benefits of technological improvements between the community and other stakeholders; and
- a review mechanism.

The expansion of LTN is being promoted at the same time as a wider airspace change process is being progressed. The airspace changes will not be finalised before the DCO is determined. Therefore, the Group also needed to consider how the development of the Noise Envelope, and the review process, can provide certainty that the noise impact (once the airspace changes have been agreed) will be no greater than that relied on in granting the DCO.

#### **1.4 Membership of the NEDG**

Martin Routledge, the Independent Chair of London Luton Airport Consultative Committee (LLACC), acted as Chair.

The Group comprised the following:

- LLAL DCO Programme Representative;
- LLAL Noise Consultant (AECOM);
- LLAL Aviation Adviser (York Aviation);
- A NATS representative;
- A representative of LLAOL as the current operator of the airport;
- Representatives from the host Local Authorities and surrounding Local Authorities;
- An easyJet representative to represent the commercial airline sector;
- A single representation of the cargo operations;
- A single representation of the fixed base operations;
- A representative from the Chamber of Commerce to represent the commercial interests in the area local to the airport;
- Two representatives to represent the local interest groups (such as Luton and District Association for the Control of Aircraft Noise (LADACAN));

- An independent Acoustic Consultant (Cole Jarman), engaged to advise the host Local Authorities; and
- Independent Acoustics advisor to LLAL (Stephen Turner Acoustics).

Where considered appropriate, the Group terms of reference allowed for subject matter experts and other specialist advisers/consultees to be seconded to assist as necessary.

## **1.5 Meetings**

The inaugural meeting of the Group was held on 14 October 2019. The prime purpose of that meeting was to review and comment on the draft Terms of Reference, agree the issues upon which the Group would initially focus and the associated work plan.

The first full working group meeting took place on 4 December 2019, with approximately fortnightly meetings held until 4 March 2020 (a total of 6 meetings). These meetings discussed various forms of controls which could form part of the Noise Envelope. Further meetings were then held as follows:

- On 11 March 2020 to review the proposed controls and discuss alternative approaches.
- On 25 March 2020, attended by a smaller group of technical noise experts, to agree a recommended set of controls.

Following the 25 March meeting, the work of the NEDG was temporarily put on hold, due to the Covid-19 pandemic and a wider review of the Future LuToN project. Following completion of this review, an online meeting was held on 8 July 2020 to discuss the proposed approach to Noise Envelope controls; following which, this interim report was drafted. This report has then been finalised following feedback from NEDG members.

It is envisaged that further meetings of the NEDG will be held, following completion of noise modelling, to support the definition of numerical values against the various limits, thresholds and control measures set out in this report.

## **2 GROUP DELIBERATIONS AND RECOMMENDATIONS**

### **2.1 Introduction**

With regard to the different types of noise control measures that could be implemented through the Future LuToN DCO Application, the Group agreed to consider the following types of control:

- Movement Caps;
- Noise Violation Limits;
- Quota Counts;
- Contour Areas; and
- Supplementary indicators such as Number Above (Nx) contours.

Position papers setting out the issues for each control type, including advantages and disadvantages of their use as a noise control, were presented to the Group.

Following discussions, recommendations were made in respect of each metric. Precise numerical values of limits or thresholds have not been proposed as these can only be derived once the aviation forecasts have been produced and noise modelling undertaken by the project team.

As this interim report has been produced at a point in time when detailed aviation forecasts for the development and the resulting detailed noise predictions are not available, the report only sets out the conclusions of the Group as to what form of controls the Group considers should be included within the Noise Envelope.

It was agreed that the precise values will be identified by the project team and, where necessary, sensitivity testing of the selected values, in the context of the noise assessment within the Environmental Statement, would be made.

It should also be noted that the form of these controls and their numerical values will be reviewed by the Group once such detailed forecasts and noise predictions are available.

### **2.2 Movement Caps**

#### **2.2.1 Discussion on Movement Caps**

Enforcing a cap on the total number of aircraft movements within a fixed time period provides a simple and transparent control on the operations at the airport and, as such, was worth considering within the suite of controls. Such controls already exist in the current permissions for the airport and the project team already proposed to

maintain the current annual movement cap, which applies during the night-time quota period (23:30-06:00).

A movement cap is easily understandable by local residents and addresses the often-stated view that the number of flyovers is a key consideration in the annoyance that occurs with respect to aircraft noise. Such a cap is relatively simple to manage by the airport operator, including the identification of breaches or when the limit is being approached.

The key disadvantage of a movement cap is that it only partly describes noise levels in the community and does not discriminate between the level of noise from individual aircraft (any aircraft movement counts the same towards the total number of movements regardless of the level of noise it generates). Also, a simple cap on the number of movements would not achieve the aim of allowing both the operator and community to share the benefit from the introduction of quieter aircraft as any benefits would only be seen by the community.

It was considered that all the above disadvantages could be resolved through the application of additional control measures such as contour area limits and/or quota limits. However, the value of the absolute movement cap would need to be selected such as to allow these measures to interact appropriately. For example, a quota count or noise contour area limit might provide the primary control on noise levels with the operation of current (or latest) generation aircraft, but the movement cap would provide a back-stop to ensure that the total number of aircraft movements did not continue to increase unreasonably if future aircraft are less noisy. These additional controls would also have the benefit of encouraging the uptake of less noisy aircraft, with their use being necessary to allow the airport to approach the movement cap without breaching other control measures.

Consideration was also be given to the time periods (both in time of year and time of day) over which any movement cap should apply. A wide range of options exist, but the NEDG recognised that it was also important to ensure that the controls were simple enough so that all stakeholders would understand the meaning of the cap.

A brief commentary on different options for times of day and year for which caps could be applied was developed for discussion by the NEDG and is presented in Table 1 below.

**Table 1. Time period options and commentary**

<b>Time Period</b>	<b>24-hour day</b>	<b>16-hour daytime (07:00-23:00) and 8-hour night-time (23:00-07:00)</b>	<b>Night-time Quota Period (23:30-06:00)</b>	<b>Morning Shoulder Hour (06:00-07:00)</b>
Annual	Recommended – provides overall control whilst allowing for seasonal and daily variations	Time periods included for completeness, as these are the time periods most commonly used for noise contour areas. Unlikely to add significant benefit if limits other time periods (24-hour, night quota period and morning shoulder hour) are used.	Existing cap at 9,650 movements to be maintained. Provides assurance over number of movements during the night-time quota period.	Felt to be worth considering but levels would need to be set in consideration of the operational requirements to deliver the expansion <sup>17</sup> . Alternatively, the operations in this period may be better controlled by means of a Quota Counts control.
92-day summer period	Application of a limit over this period would provide some further control over seasonal variations in aircraft movement numbers. However, given that noise contour area controls are likely to be applied to this period, it is not considered necessary to include further controls on summer period movement numbers only.			
Summer / Winter	As above, summer noise contour caps would provide a significant amount of control over this aspect. Hence seasonal caps were not recommended except for night-time when certainties over number of flyovers would provide additional benefit		Separated caps over for Summer (April-October) and Winter (November-March) periods could provide additional certainty over seasonal variations. However, the levels of these would need to be carefully considered to allow flexibility in seasonal variations <sup>18</sup> .	

<sup>17</sup> There is a current movement limit of 7,000 in this period.

<sup>18</sup> Hence it would be expected that the sum of these two caps would be greater than the annual cap with the annual cap providing an overall limit with the seasonal caps controlling the maximum variation between seasons.

In addition to absolute cap values for the periods identified above, consideration was also be given to defining a lower level *threshold* value. Whilst exceeding this threshold value would not in itself constitute a breach of the control measure, it could be used as a trigger for further investigation and/or liaison with any enforcement/ overseeing panel for intervention to avoid a breach occurring.

### 2.2.2 Discussion on Application of Movement Caps

Based on the information above, discussions within the NEDG started from the proposal that the following combination of movement caps should be taken forwards:

- a) A cap on the total number of aircraft movements in a 12-month period. The numerical value of this cap would be determined and justified by the project team, based on forecast movements for operating at 32 mppa.
- b) A cap on the total number of aircraft movements between 23:30 and 06:00 over a 12-month period. It is recommended that this value matches the current cap of 9,650 movements.

The Group also discussed what form the precise definition of a 12-month period should take.

The factors which were discussed by the Group were:

- i) Whether the introduction of a staged increase in the movement cap (particularly (a) above) over time to provide a control over the rate of increase of movement numbers should be included. This could be tied to stages in the development process (e.g. opening of the new terminal).
- ii) Separation of the cap in (b) above into separate summer and winter periods.
- iii) Consideration of the form of controls to be applied to shoulder hour period<sup>19</sup> (movement cap based on forecast movements, or quota count controls).
- iv) Introduction of a threshold value (say at 5% below the values set for (a) to (c) above). Reaching of this threshold would trigger further discussion between the airport operator and appropriate oversight/enforcement bodies to identify how any breach of the absolute cap will be avoided.
- v) Whether any aircraft movements will be exempt from the movement caps.

### 2.2.3 Conclusions and Recommendations

After discussion by the NEDG, the following approach to movement cap controls on the airport's operations was agreed by the Group and are recommended to LLAL:

- a) Compliance with the limits should be considered monthly by reviewing movements over the preceding 12-month period. This was agreed on the basis that control of the summer period would be maintained through

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<sup>19</sup> The shoulder hour periods are 23.00 to 23.30 hours and 06.00 to 07.00 hours

the use of noise contour limits, and hence seasonal separation of movement caps was not considered necessary.

- b) The numerical values of these caps will be defined by the project team based on the final movement forecasts included with the DCO application.
- c) The night-time quota period (23:30-06:00) movement cap of 9,650 to remain.
- d) The control of noise during shoulder periods would be best maintained through use of Quota Count (QC) limits, as discussed in Section 2.4 of this report.
- e) A threshold value at approximately 90-95% of the defined movement cap should be put in place. Once this value is reached or forecast to be reached in any 12-month period, steps should be put in place by the airport operator so that the overall movement cap is not exceeded. It is expected that these steps would be discussed and agreed with any enforcing body (see Section 4.4).
- f) The movement caps should be staged over time with the expansion of the airport, stepping up towards an absolute cap that reflects the 32 mppa scenario.

Other aspects discussed in the context of movement caps were the definition of exempted movements, and enforcement regimes. The overall discussions on these aspects are included in Section 4.

## 2.3 Noise Violation Limits

### 2.3.1 Discussion on Noise Violation Limits

Noise violation limits (NVLs) in this context are considered as pre-defined maximum noise levels ( $L_{ASmax}$ ) at agreed locations on departure routes relating to departing aircraft. If the measured noise is higher than the limit due to an aircraft departure movement, a fine would be imposed on the aircraft operator if there is not an overriding (safety, ATC etc.) reason why the aircraft operated in a manner to cause the violation.

The scheme currently operated at London Luton Airport is covered in LLAOL's Noise Action Plan, which states:

*"Noise levels of departing aircraft are monitored at three locations 6.5km from start of roll on the runway, this is the international standard set by ICAO. Any aircraft departure exceeding the noise violation limits at these monitors will be charged accordingly."*

*The noise limits are:*

- 82dB(A) during the daytime (07:00hrs – 23:00hrs)
- 80dB(A) at night (23:00hrs – 07:00hrs)

*Further reductions to the noise violation levels are planned for 2020, down to 80dB(A) during the daytime and 79dB(A) at night. Since April 2018, if an aircraft*

*exceeds these noise limits during the day time they will be fined £1000, an aircraft exceeding in the night time will be fined £2000. All fines are put into the Community Trust Fund, which is independently administered by the Bedfordshire and Luton Community Foundation.”*

It is important to note that, although NVLs are different to the other items considered by the Group, they form a complementary noise control measure. Each of the other control measures being discussed by the Group represent a form of limit or threshold value, above which enforcement action could be taken by the designated enforcing body against the airport operator or owner. NVLs, on the other hand, constitute enforcement against aircraft operators that would be enforced by the airport operator, and serve two purposes:

- i) Providing assurance to the local communities that particularly noisy aircraft movements are not considered acceptable, and penalties are applied to the operators of such aircraft.
- ii) Providing an incentive from the airport operator to the aircraft operators to encourage noise minimisation and the use of less noisy aircraft.

The benefits in such a system are that it provides a clear, real-time control, and the consequences of breaching the agreed limits are clearly visible. Given the form of the control, further enforcement by an external body would be limited, and probably only comprise confirmation that the system is being correctly applied by the airport operator.

As there is little variation on how aircraft fly on approach, and for safety considerations, NVLs are currently applied only to departure noise. They are normally used to prevent operations by excessively noisy aircraft and identify operators not following agreed or best practice procedures.

NVLs are currently set at values that reflect the sound level produced by the noisiest aircraft in operation at the airport. In order to ensure that such limits would be applied consistently across all aircraft (rather than just for the noisier aircraft), NVLs would need to be set at differential levels, for example with the noise limit dependent on the QC band of the aircraft. However, this approach would not encourage the uptake of quieter aircraft (though it should be noted that noise reductions is not generally the primary driver behind the uptake of these aircraft by operators).

An alternative approach to encourage the uptake of quieter aircraft would be to reduce the noise levels associated with the NVLs with time, as is currently the case.

A final consideration in the application of NVLs is the location(s) at which they will be applied. In particular, whether additional locations should be considered such as extra locations closer to the runway to assist in management of noise from the airport rather than for penalisation. More distant monitoring points are not recommended due to inherent difficulties in isolating aircraft noise from other sources of noise and the greater variation in flight paths that occur at increasing distances from the airport.

It was also noted by members of the NEDG that the use of NVLs had the beneficial effect of ensuring adequate and properly calibrated noise monitoring



equipment would be maintained by the Airport Operator. This would then be used to communicate noise performance information to communities.

### 2.3.2 Position on Application of Noise Violation Limits

It was considered by the Group that NVLs should form an integral part of noise management for LTN. As discussed in the section above, it was noted by the Group that the nature of these controls is an enforcement measure applied by the airport operator on aircraft operators, rather than a measure for which enforcement action could be taken against the airport operator or owner itself (other than to ensure that the limits are being applied correctly).

Key areas discussed by the Group were:

- a) Should additional monitoring points be included?
- b) Should NVL values reduce over time? If so, how?
- c) Should NVLs be graded for different aircraft (e.g. by QC bands)?

It was noted that items (b) and (c) could not both be applied. Should limits be based on QC bands, then reductions over time would not be required, though over time aggregate QC values would be expected to fall as newer, quieter aircraft make up a bigger proportion of the total mix. If approach (b) was selected, the NVLs would form a mechanism to encourage the uptake of quieter aircraft as these would be less likely to be subject to fines. For the noisier aircraft (those more likely to be subject to fines), it would also encourage the quietest possible operation. However, approach (c) would not provide for the incentivisation of quieter aircraft but would encourage quieter operation of all aircraft.

### 2.3.3 Conclusions and Recommendations

The Group discussed the relative benefits of single level NVLs with values decreasing over time, or NVLs that are graded according to QC of individual aircraft. It was considered that, if limits were not graded, then the NVLs could be considered to be less relevant to quieter aircraft, which could potentially generate excessive noise but be unlikely to exceed the limit value.

It was noted that, whilst modern aircraft are quieter, the noise difference (and the potential to avoid noise violation fines) is not the driving factor behind aircraft operators' choice to upgrade their fleets. This is generally driven by fuel efficiency, with consequential cost savings, as well as a general need to replace older, less reliable and expensive to maintain aircraft. Hence, it was agreed by the Group that NVLs are unlikely to represent an incentive to aircraft operators to operate quieter aircraft. However, it was noted that some form of incentive for the uptake of quieter aircraft should be included; this could take the form of either differential landing charges and/or differential financial fines of the NVLs.

The potential for inclusion of additional monitoring locations was discussed by the Group. It was agreed that whilst additional noise monitoring locations (particularly closer to the airport) would be beneficial in gaining a better understanding of how the aircraft are operated, the use of these for setting noise violation fines would not be appropriate at this point.

The majority of the group agreed that:

- NVLs should be applied at LTN, with the noise level being dependent on the departure QC classification of the aircraft type. The precise values of these limits would need to be defined through an analysis of historic data and should be no greater than limits in use at LTN from 2020.
- To encourage quieter aircraft, the Group would recommend the implementation of differential airport charges based on QC classifications.
- Additional monitoring locations closer to the airport should be considered for the monitoring of noise abatement procedures, but not linked to fining.

The Group also recommends that consideration should be given to the use of measures to manage repeat offenders.

## 2.4 Noise Quota System

### 2.4.1 Discussion on Noise Quota System

The QC regime is designed to provide a simple means of accounting for the different noise levels generated by different aircraft when considering the number of aircraft movements. Based on aircraft noise certification data, each aircraft type is classified by a QC value based on the measurements made at set locations during the certification process. Separate QC values are assigned for take-off (based on measurements at the flyover and sideline (lateral) positions) and for landing (based on the single measurement at the approach position). The conditions for the certification measurements are tightly controlled.

Use of Quota limits (e.g. a QC total summed across all aircraft movements in a defined period) gives more control over noise levels than a simple movement limit. This is because noisier aircraft will count more towards the Quota limit than quieter types. The system has a proven track record, including being in current use at LTN. It can be relatively easily used as a forward planning tool allowing the airport operator to plan operations to ensure compliance. However, the relationship between noise levels from aircraft operating at LTN and the corresponding QC classifications may not always be straightforward, as these will be subject to the details of how the aircraft are operated to and from the airport. Furthermore, as a forward planning tool the QC count may not reflect the actual aircraft that are used due to factors such as aircraft substitutions which may occur in normal airline operations.

The application of Quota limits does provide an incentive to the airport to encourage the use of quieter aircraft as this would, in turn, allow for a greater number of movements (up to any movement cap imposed).

Key considerations in devising an appropriate form of Quota limits are:

- 1) Over what periods of the day should limits be applied? There is currently a Quota limit in use at LTN over the night-time quota period (23:30-06:00) of 3500 QC points (over a 12-month period).
- 2) Over what period (e.g. annual, rolling 12-month, etc.) should they be applied?
- 3) Should Quota limits include intermediate steps to control the speed of change or to require future improvements in noise levels?

- 4) Does the standard QC system provide the full level of control required, or would a bespoke system with a greater number of classifications be appropriate?

The QC system currently in use at LTN classifies QC values in 3 dB bands. This approach could be extended to use a smaller differential between QC bands. For example, London City Airport is introducing an Aircraft Noise Categorisation Scheme (ANCS) whereby all aircraft are categorized into QC bands for both departures and arrivals in a manner similar to that currently operating at Luton, except the number of bands is significantly increased as they are in 1 dB steps, giving a total of 27 bands.

#### 2.4.2 Position on Application of Noise Quota System

Discussions within the NEDG started from a premise that Quota limits should form part of the overall Noise Envelope for LTN, in continuation of their current use. The following points were taken forward for discussion by the Group to agree a position for the application of Quota limits at Luton.

- 1) Is matching the existing time period of the night quota period (23:30-06:00) appropriate? Should any changes to the time periods be considered?
- 2) Over what time frame should the limits apply. The current limit applies over a 12-month rolling period.
- 3) As the Quota limit itself provides a balance between noise levels of individual movements and the total number of movements, it may not be necessary to include a staged growth approach. If the limit is set at an appropriate value, it should act to control growth in movement numbers in the absence of introduction of quieter aircraft without staging being necessary. However, future reductions in Quota limits may be considered to provide an incentive for continued uptake of newer quieter aircraft and ensure the benefits of quieter aircraft are shared between the airport and the community.
- 4) The benefits and disadvantages through employing a more detailed QC system, such as that being implemented at London City Airport, was discussed by the Group

#### 2.4.3 Conclusions and Recommendations

Discussion was held within the Group regarding the extension of the night quota period to include some of the shoulder hours. However, it was concluded that the Quota limit should remain applied over the night quota period only. It was also agreed that the Quota controls should be assessed over a rolling 12-month period to be consistent with the movement cap controls.

With regard to the requirement for stepped changes in the Quota controls, it was acknowledged that the nature of QC limits ensure that growth in movement numbers has to be matched by a reduction in noise levels (or QC values) of individual aircraft. However, it was noted by the Group that there is a current requirement to reduce the annual night quota period Quota limit from its current value of 3,500 to 2,800 by 2028. It was suggested that a similar target should be

included within the Noise Envelope, with Quota targets set to reduce in the future. This approach would ensure that the benefit of reduction in the QC values for individual aircraft would be shared between the airport operator (through allowing an increase in total aircraft movements) and the community (through benefits of reduced noise levels).

The Group noted that the benefit of Quota limits is that these can provide a means of applying controls at the forecasting stage, whereas noise contours (see Section 2.5 below) are a retrospective check that ensure that actual noise impact was within set limits. Consequently, the QC system was identified as a method to aid forecasting and granting of new slots to aircraft operators.

Aircraft in neighbouring QC bands defined in 3 dB increments may vary in noise level from 0.1 to 5.9 dB. Consequently, the accuracy in using such a coarse banding system was questioned by the Group and whether a 1 dB band system would offer better alignment with retrospective noise contours and would better demonstrate reduction in noise from improvements in technology.

The introduction of an alternative QC-type system in 1 dB bands, such as that developed by London City Airport, was discussed by the Group.

Whilst there is benefit in using a QC system of a finer resolution, there were uncertainties about whether it was practicable to adopt such a system. Hence, the Group concluded that the standard QC methodology (with 3 dB bands) should be kept at LTN, to maintain consistency with other major London airports. This approach also allows the wider public to understand the system as it is well documented and allows direct comparison with other airports.

It was also noted that the current controls at LTN allow the Quota limit to be exceeded by up to 10% in any one year, so long as this is balanced by a subsequent reduction in the Quota limit for the following year (although this allowance has never been used in practice).

As for the movement caps control, the Group recommended that a threshold level be defined at 95% of the Quota limit. Once this value is reached or forecast to be reached in any rolling 12-month period, steps should be put in place by the airport operator to ensure that the overall Quota limit is not exceeded. It is expected that these steps would be discussed and agreed with any enforcing body (see Section 4.4).

## **2.5 Noise Contour Areas**

### **2.5.1 Discussion on Noise Contour Areas**

Noise contours were discussed in a single meeting of the NEDG but fell into two distinct categories:  $L_{Aeq}$  based on contours and  $N_x$  contours.  $L_{Aeq}$  based contours are discussed in this section of the report, with a separate discussion of  $N_x$  contours in Section 2.6.

The  $L_{Aeq,16h}$  noise metric was adopted by the UK Government in 1990 and is commonly used in the UK to describe the average daytime noise impact from aircraft. The concept of assessment criteria for aviation noise was expanded

during the appraisal for increasing UK airport capacity in the Appraisal Framework Consultation<sup>20</sup> (AFC) document. That document recommended the use of the  $L_{Aeq,16h}$  and  $L_{Aeq,8h}$  for assessing aircraft noise impacts.

The  $L_{Aeq,T}$  takes account of the Sound Exposure Level of individual noise events, but also captures the number of times these events occur. The  $L_{Aeq,T}$  is most commonly applied for airports over the 16-hour period of 0700- 2300 ( $L_{Aeq,16hr}$ ) on an average summer day (between mid-June and mid-September) and over the 8-hour period of 2300-0700 ( $L_{Aeq,8hr}$ ), on an average summer night.

The  $L_{Aeq,16h}$  was identified as an indicator of community annoyance based on the findings of the 1982 Aircraft Noise Index Study (ANIS)<sup>21</sup>. Based on data collected in 2014, the Civil Aviation Authority's (CAA) Survey of Noise Attitudes<sup>22</sup> identified that the sensitivity of people to aircraft noise had increased. The study found that approximately the same percentage of people annoyed by aircraft noise in the 1982 ANIS study at 57 dB  $L_{Aeq,16h}$  now occurs at 54 dB  $L_{Aeq,16h}$ .

To account for the increased sensitivity to noise, the developing UK aviation strategy identifies 51 dB  $L_{Aeq,16h}$  and 45 dB  $L_{night}$  as the onset of adverse effects of aircraft noise for an average person. It should be noted that the  $L_{night}$  metric is an annual average whereas the  $L_{Aeq,16hr}$  and  $L_{Aeq,8hr}$  metrics are summer averages. Within the consultation response on UK Airspace Policy (October 2017) the government proposed the change from  $L_{night}$  to  $L_{Aeq,8hr}$  for consistency with the daytime metric. Given the difference between these metrics, it should be noted that when 45 dB is used as an  $L_{Aeq,8hr}$  value, it is more onerous than if applied as an  $L_{night}$  value, which would be expected to have a smaller contour area, as it averages over the whole year rather than the, typically busier, summer period.

In 2002 the European Commission published Directive 2002/49/EC<sup>23</sup> (END), which established the  $L_{den}$  as a common environmental noise indicator for the European Union. Consequently, all noise mapping undertaken for the END is required to present contours using the  $L_{den}$  noise metric (which is an annual average). This indicator is a composite of the  $L_{day}$  ( $L_{Aeq}$  0700-1900 hours),  $L_{evening}$  ( $L_{Aeq}$  1900- 2300 hours) and  $L_{night}$  ( $L_{Aeq}$  2300-0700 hours) levels but with a 5 dB penalty being added to the evening value and 10 dB penalty being added to the night value, and calculated over an annual average day.

For many years, UK airports have produced noise impact information in contours showing locations of equal noise exposure in terms of  $L_{Aeq,16h}$  and  $L_{Aeq,8hr}$  (or  $L_{night}$ ).  $L_{den}$  has been criticised in the past for the lack of scientific evidence that supports the additional decibel weightings it places on evening and night noise. Also, because it averages noise over the full 24-hours into a single figure, it is less sensitive to changes in airports' operations.

It was noted by the group that some aspects of noise contours, such as their shape and the population enclosed within any given contour are, to some extent,

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<sup>20</sup> Airports Commission (2014); Appraisal Framework.

<sup>21</sup> Brooker P, Critchley J B, Monkman D J & Richmond C (1985); DR Report 8402: United Kingdom Aircraft Noise Study: Main Report.

<sup>22</sup> Civil Aviation Authority (2017); CAP 1506, Survey of noise attitudes 2014: Aircraft.

<sup>23</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32002L0049&from=EN>

outside of the control of the airport operator. Whilst the location of residential properties, and any new residential development is outside of the airport's control, the shape of the contour can be controlled to some extent. However, wider aircraft routing and Modal split can both affect the shape of the contour and may not be able to be controlled by the operator.

The choice of noise modelling software was also discussed by the group. It was noted that current noise modelling undertaken by LLOAL uses INM software to ensure backwards comparability. However, INM is no longer supported, and has been replaced by AEDT.

## 2.5.2 Position on Application of Noise Contour Areas

As with some of the other recommended control measures, the Group noted that the definition of numerical limits on the area enclosed by specific contours could not be made at this stage. This is because forecast aircraft movements and fleet mix, and consequential forecast noise contours, are not available at this time.

It was noted that current planning conditions at LTN refer to the 57 dB  $L_{Aeq,16hr}$  contour and include an area limit which states that the area enclosed by this contour should not exceed 19.4 km<sup>2</sup>. The planning conditions also include a limit on the area enclosed by the 48 dB  $L_{Aeq,8hr}$  contour; stating this should not exceed 37.2 km<sup>2</sup>. By 2021, LLA are required to develop a strategy to define methods to reduce the area of the noise contours by 2028 for daytime noise to 15.2 km<sup>2</sup> for the area exposed to 57 dB  $L_{Aeq,16hr}$  and above. For night-time noise, this is required to reduce to 31.6 km<sup>2</sup> for the area exposed to 48 dB  $L_{Aeq,8hr}$  and above. LLAOL are currently making an application to make changes to the areas in these limits in the short term (with the longer term targeted reduction remaining).

Key topics that were discussed by the Group with regard to  $L_{Aeq}$  based contours were:

- i) Is the current approach of using average summer day and average summer night  $L_{Aeq,T}$  contours appropriate and sufficient?
- ii) Should the levels of  $L_{Aeq,T}$  contours in the current planning controls be retained (57 dB daytime and 48 dB night-time), or should alternative values be considered?

On this matter, it was noted that a daytime value of 54 dB  $L_{Aeq,16hr}$  could be considered more appropriate with reference to the findings from the SoNA study. Consideration was also given to use of the LOAEL and SOAEL values as applied in the ES. However, it was felt that this would require use of both LOAEL and SOAEL contours (separately for day and night), to ensure that, for example, changes in aircraft operations did not reduce the wider LOAEL contour whilst increasing the noise footprint closer to the airport (hence increasing the size of the SOAEL contour). Use of the above values was considered a good compromise at an intermediate noise level. It was also considered that the size of the LOAEL contour may be influenced by routing of aircraft once they were under the control of NATS, and therefore outside of the direct control of the airport. It was noted that there may be future updates to SoNA which may

influence this decision. This should be picked up as a topic for future review by the NEDG.

- iii) How should the modal split of runway operation be considered? As the weather conditions, and hence the split in any particular year, are outside of the control of the airport, the use of a fixed value for this provides a degree of certainty for the operator. Without this certainty, it is possible that compliance with a contour limit could be impacted by the balance of wind conditions over the year.
- iv) Is the application of a threshold appropriate in a similar manner to that considered for movement caps and Quota limits?

### 2.5.3 Conclusions and Recommendations

The Group discussed what form a contour control should take, and agreed the following points:

- The area of a defined contour should be the limiting value, rather than its shape or population exposure. Both the shape of the contour and the population exposed are influenced by factors outside of the airport's control. However, the population exposure should be reported by the operator.
- Modelling should be undertaken using AEDT software. It should be noted that this is a change to modelling currently undertaken by the operator which is based on the now unsupported INM software. The current project was seen as an opportunity to make this change.

It was agreed the  $L_{Aeq}$  based contours should form part of the control mechanisms, despite the disadvantage that they are only available retrospectively, and hence difficult for the airport operator to reliably ensure that contour area limits will not be exceeded. However, as these contours provide the best link to community annoyance and directly measure the noise impacting on communities, it was felt that their continued use was helpful.

It is recommended that the contour controls should take the form of:

- Summer average daytime and night-time  $L_{Aeq}$  contours. This is consistent with the historic approach at LTN and the approach taken by other major airports, and the basis of the dose-response relationships from SoNA. The Group considered that annual average contours should also be reported by the airport operator, but not subject to control.
- The contours controlled should be the area within the 54 dB  $L_{Aeq,16hr}$  and 48 dB  $L_{Aeq,8hr}$  values.
- The LOAEL and SOAEL values should be included in the contours reported by the airport operator, but not subject to controls.
- Controlled contours should be calculated using an average modal split of runway operations (a fixed percentage, taken from historic averages), but single mode contours should also be reported, along with the contours with the actual modal split for a given year.

- A threshold value should be set at 85% of the control limit for each contour area. If this threshold is exceeded, the operator must take steps to avoid breaches in future years. This value was chosen to be lower than the equivalent threshold values for movement caps and QC limits given the retrospective nature of the noise contours.

## 2.6 Supplementary Indicators

### 2.6.1 Discussion on Supplementary Indicators

At an early stage in the deliberations of the Group, the only supplementary indicator that was considered worthy of further investigation related to contours representing the number of events exceeding a defined maximum noise level. These are normally denoted as Nx contours.

The discussion of Nx contours was combined into the same meeting as that discussing  $L_{Aeq,T}$  contours, as discussed in Section 2.5 above, as many of the considerations are common to both forms of contour.

Whilst  $L_{Aeq,T}$  provides a good measure of the overall noise impact of an airport, it does not provide explicit information relating to the number of events which combine to give the reported noise exposure at a particular location. This is because a value of, say, 65 dB  $L_{Aeq,16hr}$  can be made up of 45 events at 96 dB(A) SEL or 450 events at 86 dB(A) SEL. For this reason, when consulting on the construction of Sydney's third runway in 1995, the Australian Department of Infrastructure and Transport devised a metric based on the number of noise events (aircraft movements) that reach or exceed a certain sound level threshold within a given time period. This measure, called Number Above (or, in Europe, Frequency contours), provides an additional level of information on how the sound experienced is made up.

Nx contours show the number of events (i.e. flights) that exceed a pre-determined noise level, expressed in dB  $L_{ASmax}$ . For example, N65 contours show the number of events where the noise level from those flights that are at or above 65 dB  $L_{ASmax}$ . The contours for N65 for daytime flights and N60 for night-time flights are often used as they are specified in the Department for Transport's Air Navigation Guidance as supplementary metrics. Typically, contours ranging from 10 events to 400 events are plotted (though the upper end of this range is unlikely to be experienced at LTN).

The Nx metric may be considered useful as it is understandable and describes an aspect of how people experience aircraft noise which is not readily obvious from the  $L_{Aeq}$  metric. By showing numbers of noise events, Nx contours may be used to address the common criticism that  $L_{Aeq,T}$  contours do not demonstrate clearly how often aircraft flyovers occur.

However, the Nx contours do not differentiate between the level of noise above a certain threshold, or the duration of the noise from the aircraft flyovers. So, if considering the N65 contour, an event of 10 second duration with a maximum level of 66 dB(A) counts exactly the same as an event of 40 second duration with a maximum level of 91 dB(A). Yet the impact on those hearing each event would be very different.



There is also likely to be a strong correlation between Nx contours and  $L_{Aeq,T}$  contours, for a given aircraft fleet mix. Hence, the NEDG felt that careful consideration was needed regarding whether Nx contours provide sufficient extra control over other measures to justify their inclusion in the Noise Envelope.

### 2.6.2 Position on Application Nx contour limits

The Group discussed the application of Nx contours as a control measure at LTN, and, in particular, the following questions:

- Should Nx contours be used as an additional limit within the Noise Envelope?
- Should these be N65 (daytime) and N60 (night-time) or other levels?
- Which value contours should be used?

During these discussions, it was noted that the NEDG and UK airports in general do not currently have large amounts of experience in reviewing and understanding Nx contours. The only experience of their use as a control measure that was referenced was at Christchurch (New Zealand), where more control over Nx contours may be possible due to a diversity of possible flight paths.

### 2.6.3 Conclusions and Recommendations

It was agreed that, as Nx contours are not a well understood or commonly used noise metric in the UK, they do not form a realistic control measure. Furthermore, as noise levels of individual departure flights are controlled through the use of NVLs, the additional benefits of Nx controls above those previously discussed in this report were not considered sufficient to justify their inclusion.

It was agreed that Nx contours for various scenarios should be included within the Environmental Statement, so that these data are available to stakeholders but should not form a control measure in their own right.

It was also noted that Nx contours are useful for looking at airspace change and should be included in the operator's annual noise reporting.

### 3 RECOMMENDATIONS FOR MANAGEMENT OF NOISE

#### 3.1 Control Measures

Following the discussions of each of the individual topic areas covered in the previous sections of this report, the group then discussed options to refine and/or complement with further measures to support the pro-active management of noise at LTN.

This discussion primarily focussed on the use of QC based controls to support the noise contour limits and provide a means for the airport operator to control noise proactively. The aim of such controls would be to allow early identification of likely breaches of the contour limits, whilst there was still time for measures to be put in place to avoid a breach.

It was noted that such measures could be considered as being part of the remit of the airport operator's management of operations to comply with limits. However, the Group agreed that the inclusion of such measures within the requirements of the Noise Envelope would provide additional assurance that such management measures were implemented.

A proposed structure of '*limits*', '*thresholds*' and '*targets*' was devised by the group to meet this aim. The '*limits*' and '*thresholds*' were defined as set out in the preceding sections of this report. The '*targets*' would be QC based measures to be used by the airport operator as a management tool to assist them in ensuring compliance with the limits. Section 4 of this report summarises all of these controls and how they are envisaged to interact.

## 4 SUMMARY OF PROPOSED CONTROLS

### 4.1 Control Measures

Based on the discussions in NEDG meetings, the following arrangement of limits, thresholds and targets has been put together and the group consider these would provide an effective framework for the management and control of noise from aircraft operations at LTN. They are set out in Table 1 below, and comprise the following controls:

- **Limits.** These are enforceable limits, whereby if they are exceeded the **appropriate** enforcing body is able to take immediate enforcement action against the airport.
- **Thresholds.** These are values set proportionally below the limits but using the same indicators. If the airport exceeds any of these threshold values, the airport operator would be required to provide a detailed explanation to the enforcing body<sup>24</sup>. This explanation **would** also need to include an action plan as to how the airport operator will manage operations going forward to avoid the exceedance of the corresponding limit value. The level of these thresholds with respect to the limit values would be subject to the same periodic review by the Independent Scrutiny Panel as the Noise Envelope.
- **Management Targets.** For some control measures, where the limit and threshold values cannot be easily integrated into the forecasting and scheduling undertaken by the airport operator, a third level of control is proposed, which has been termed “targets”. These target values implement a different control measure (Quota based targets linked to a contour-based control), which can be more closely monitored and controlled dynamically through forecasting and scheduling by the airport. The value of the target would be derived from the aviation forecasts to match that of the contour threshold as closely as possible, such that it would be expected that an exceedance of the Quota target would also correspond to an exceedance of the corresponding contour threshold. However, the exceedance of the target could be more easily identified at an earlier stage, or even avoided through appropriate scheduling controls where possible. Hence corrective action could be taken more quickly. It is expected that the exceedance or predicted exceedance of any of these targets would result in a requirement for action planning in a similar manner to the exceedance of any of the threshold values as set out above.

It should be noted that all of the above could be subject to graduation over time to provide a control over the rate of growth.

Whilst the Group decided it was appropriate to retain 3 dB QC bands for the enforceable limits, and also the management target Quota system, they considered that a change to adopting 1 dB QC bands may bring benefits in the future, subject to a study to determine the practicability of implementation and benefits which would be derived in the context of operations at LTN.

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<sup>24</sup> Details to be agreed and are the subject of a separate paper regarding enforcement mechanisms.

**Table 2. Proposed Noise Management Framework**

Control Measure and Time Period	Limit	Threshold	Target (for management)
Night-time Quota Period – Movement Cap	9,650 movements over 12-month rolling average <sup>25, 26</sup>	90% of limit <sup>27</sup>	-
Night-time Quota Period – QC Cap	12-month rolling average <sup>26</sup> . Value to be determined	90% of limit <sup>27</sup>	-
Annual Movement Cap	12-month rolling average <sup>26</sup> . Value to be determined	90% of limit <sup>27</sup>	-
Average Summer Day – Daytime	Area enclosed by 54 dB $L_{Aeq,16hr}$ contour. Numerical value to be determined	85% of limit <sup>27</sup>	Quota based target to be derived to be equivalent to threshold value but provide forward looking control that must be monitored through forecasting and scheduling
Average Summer Day – Night-time	Area enclosed by 48 dB $L_{Aeq,8hr}$ contour. Numerical value to be determined	85% of limit <sup>27</sup>	Quota based target to be derived to be equivalent to threshold value but provide forward looking control that must be monitored through forecasting and scheduling
Noise Violation Limits	Noise violation limits to be applied at current locations. Limit values to be graded based on departure QC of aircraft.		

**Incentivisation**

Whilst it is outside of the remit of the NEDG group in defining the structure of a Noise Envelope, the Group felt that would like to take this opportunity to comment on incentivisation measures to assist in achieving compliance with the Noise Envelope. In addition to the control measures above, the Group considered that measures, such as the use of differential landing fees and airport charges, should be put in place by the airport operator to encourage the uptake of quieter aircraft at LTN. As these measures form a means for the airport operator to achieve compliance with the above limits in the context of a growing airport rather than a control measure in their own right, they are not considered to form an explicit part of the Noise Envelope.

**4.2 Other Indicators to be Reported**

It was appreciated by the Group that noise indicators reported, beyond those required to demonstrate compliance with the Noise Envelope is outside the remit of the Group. However, the Group considered that the following aspects should be reported by the airport operator on a quarterly and/or annual basis (in addition

<sup>25</sup> Continuing current limit value as previously committed by project

<sup>26</sup> To be checked for compliance on a monthly basis, reviewing data from the previous 12-month period.

<sup>27</sup> Value may require updating in light of forecast movements (when available), the difference between the threshold and limit values would need to be no less than the greatest year-on-year increase in movements expected to minimise the likelihood of both the threshold and limit values being newly exceeded in a single year.

to reporting of the measures directly controlled by the Noise Envelope), in order to provide stakeholders with a fuller picture of noise from the airport:

- Noise contours in 3 dB bands starting at for 51 dB  $L_{Aeq,16hr}$  for daytime noise and 45 dB  $L_{Aeq,8hr}$  for night-time noise (as currently reported), plus an additional contour at 55dB  $L_{Aeq,8hr}$  (as the night-time SOAEL value<sup>28</sup>) for the following situations:
  - Summer average (based on fixed standard modal split);
  - Summer average (based on actual modal split)
  - Summer average, single mode operations;
  - Annual average (based on fixed standard modal split);
  - Annual average (based on actual modal split); and
  - Annual average, single mode operations.
- N65 (daytime) and N60 (night-time contours), for the following values (where applicable): 25, 50, 100, 200, 400, and
- Counts of the area, number of households and population within the various contour bands.

### 4.3 Model Validation

The Group was aware that further work will be undertaken to validate the noise model prior to submission of the DCO application. The Group would like to see the following aspects included in this validation, and information regarding the validation to be presented for the group to review prior to submission of their final report.

The NEDG considers that the following three aspects to noise model validation should be undertaken:

1. Testing AEDT output against INM outputs;
2. Calibrating aircraft departure profiles; and
3. Calibrating aircraft noise levels.

### 4.4 Enforcement

LLAL's legal advisors, BDB Pitmans, produced and circulated notes to the Group in order to:

- a. inform the NEDG of a possible framework for operating and controlling a noise envelope and discharging the elements of noise 'requirements' within the scope of any Development Consent Order; and
- b. explain the statutory enforcement regime in respect of DCO requirements (as opposed to a framework for the discharge of such requirements).

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<sup>28</sup> Note that the daytime SOAEL contour will naturally be produced as a result of the 3 dB bands.

At meetings of the NEDG initial discussions took place in relation to the role of an Independent Body within the Noise Envelope Framework. It was suggested, drawing on Heathrow Airport's Third Runway proposals, that a DCO Requirement noise envelope framework could incorporate an external independent review and scrutiny body to ensure that the noise envelope framework is operating effectively. That role could be fulfilled by the local planning authority, by an independent group, the local planning authority in consultation with an independent group or by another party. However, the composition of such a group including the type and number of independent experts that it might contain, has not yet been discussed by the NEDG. BDB Pitmans explained that the role played by an independent body would not amount to strict statutory planning enforcement, but more accurately the discharge of DCO requirements.

In terms of the functions that might be fulfilled by an independent scrutiny body, it was suggested that they might include the following:

- a. Reviewing and commenting on any proposed changes in caps;
- b. Reviewing and commenting on any Threshold Level Action Plans; and
- c. Reviewing and commenting on Noise Violation Limits.

BDB Pitmans also stated that if an independent review body is to be adopted it will be necessary to constitute such a body and provide a governance framework and terms of reference to allow it to operate effectively. The NEDG had not yet reached a stage of recommending a detailed governance framework for discussion. However, BDB Pitmans produced the following suggested heads of terms for future discussion:

- a. Role of the body:
  - i. management, monitoring and enforcement
  - ii. specific roles
- b. Aims and objectives of the body
- c. Membership
  - i. Specified organisation names and initial specified Individuals
  - ii. Specified minimum and maximum number of people
  - iii. Duration of term of each member
- d. Quorum – a quorum of members will be specified percentage of members.
- e. Chairing meetings
  - i. chair and vice-chair
  - ii. duration of terms of chair and vice-chair
  - iii. process for appointment.

- f. Frequency of Meetings
- g. Administrative support
- h. Decision making framework in respect of each role.
- i. Dispute Resolution process - if there is a dispute in respect of monitoring/compliance, the issue could be referred to the Secretary of State or delegated to the CAA for resolution.

Beyond the discharge of DCO Requirements (as discussed above in relation to a potential independent scrutiny/review body), BDB Pitmans explained that the 'relevant local planning authority' (potentially 'authorities' if in accordance with the Planning Act 2008) has the statutory power to enforce the various DCO requirements pursuant to Part 8 of the PA 2008. The Relevant Local Planning Authority in relation to any land is the local planning authority for the area within which the development land is situated.

It is noted that LLAL is in the process of developing an environmental management strategy termed 'Green Managed Growth' (GMG) to manage the wider environmental impacts consequent upon the growth of the airport. Noise will clearly be one element of this strategy but the NEDG have not yet had the opportunity to consider the GMG proposals; the extent to which they might provide for an independent scrutiny/review body; and the functions such a body might fulfil. It is assumed that the opportunity will be provided for the Group to consider the GMG proposals once formulated, particularly in relation to the proposed approach to management and scrutiny.

#### **4.5 Discounted Movements**

Throughout the discussion regarding each of the control measures covered in this report, it was noted that agreement is required as to which (if any) aircraft movements would be able to be disregarded from counting towards the limit values.

As referenced in the London Luton Airport Noise Management Plan Review (July 2019, Version 1.0), movements which can currently be disregarded are:

- those allowed which would have led to serious congestion or hardship to passengers/animals;
- those allowed which resulted from widespread/prolonged disruption of air traffic;
- an emergency which consists of an immediate danger to life or health, whether human or animal.

These were noted by the group and accepted to be reasonable.

#### **4.6 Review Process**

The NEDG considered that a regular review of the Noise Envelope would be necessary. It was felt that the Group should be re-formed and meet to discuss the potential need for any changes to the envelope every five years.

The Noise Envelope should also be reviewed if there are significant changes affecting the operation of the airport. This would allow changes such as the future modernisation of airspace to be reflected in the Noise Envelope without the need to wait for the next five yearly review.



## **Appendix A. NEDG TERMS OF REFERENCE**

**CONFIDENTIAL**

### **LONDON LUTON AIRPORT NOISE ENVELOPE DESIGN GROUP TERMS OF REFERENCE (Version v6.0)**

#### **INTRODUCTION**

For airport developments, which are Nationally Significant Infrastructure Projects (NSIPs), the Applicant is required to put forward plans for a Noise Envelope (the envelope). The proposed expansion of London Luton Airport (LTN) is an NSIP and therefore a Noise Envelope will need to be defined and provided as part of the Development Consent Order (DCO) application.

The envelope needs to be tailored to local priorities and include clear noise performance targets. As such, it is necessary for the design of the envelope to be defined in consultation with local communities and relevant stakeholders, and take account of any independent guidance. The Noise Envelope Design Group (NEDG – the Group) has been established for this purpose and will operate in accordance with the Terms of Reference set out in this document.

#### **NOISE ENVELOPE**

The Noise Envelope is a legally binding framework of limits and controls to manage aircraft noise. It is the responsibility of the DCO Applicant – London Luton Airport Limited (LLAL) – to put forward the Noise Envelope proposals as part of the DCO application. Consequently, LLAL’s DCO programme team have responsibility for developing and defining the envelope taking into consideration the advice and views provided by the NEDG.

The envelope will be designed to protect communities whilst enabling the airport to operate efficiently and allow it to grow in accordance with the limits defined by the envelope consented through the DCO. The overall aim is to ensure real benefits are delivered and shared between communities, consumers and businesses during each stage of growth.

It will provide certainty to the industry and communities about how noise will be managed to comply with Government policy; balancing growth and noise reduction, for the long term. The envelope will include a set of aims and principles, performance targets, evaluation criteria, the mitigation measures to be applied as considered necessary, and a review period.

#### **AIMS AND OBJECTIVES**

The prime aim of the NEDG is to provide independent advice and assure the robustness of the assessment and mitigation of sound, noise and vibration, including effects on health and quality of life, associated with the proposed expansion of LTN. The NEDG will also advise on current best practice throughout the consultation and application processes.

The Group will assure in particular that the Noise Envelope includes:

- clear and well-defined noise objectives;
- the principles and priorities on which the Noise Envelope is based;
- the enforceable limits;
- a method for evaluating noise control measures; and
- a review mechanism and a mechanism for sharing the benefits of technological improvements between the community and other stakeholders.

The expansion of LTN is being promoted at the same time as the wider airspace change process is being progressed. The airspace changes are unlikely to be finalised before the DCO is determined. Therefore, the Group will also need to assure that the development of the Noise Envelope and the review process, provides certainty that the noise impact (once the airspace changes have been agreed) will be no greater than that relied on in granting the DCO.

## **TIMESCALES**

LLAL is aiming to submit the DCO application in June 2020. Consequently, the Group will need to ensure that their recommendations are provided no later than the end of March 2020. The Group will therefore, as far as is practically possible, meet every two weeks.

## **KEY ISSUES**

The overall aim is for LLAL to be in a position to ensure that there is clarity in respect of its noise aspirations and the objective of the Noise Envelope, having given consideration to the recommendations of the Group. To this end, the deliberations of the Group will principally focus on:

- Overall Aircraft Movement Caps
- Noise Contour Areas & Shape
- Noise Quota System
- Noise Violation Limits
- Supplementary indicators, e.g. N>xx noise contour area

## **MEMBERSHIP**

An individual, with appropriate knowledge and experience, independent of London Luton Airport Limited (LLAL), the airport operator London Luton Airport Operations Limited (LLAOL) and other parties represented on the Group, will lead and chair the Group. To this end Martin Routledge, the Independent Chair of London Luton Airport Consultative Committee (LLACC), will act as Chair.

The Group will comprise the following:

- LLAL DCO Programme Representative
- LLAL Noise Consultant (Arup)
- LLAL Aviation Adviser (York Aviation)
- A NATS representative
- An Independent Commission of Civil Aviation Noise (ICCAN) representative, as observer
- A single representative (officer not elected member) from each of the four host authorities and Central Bedfordshire Council, Hertfordshire County Council and Buckinghamshire Council.
- An easyJet representative to represent the commercial airline sector
- Single representation of the cargo operations
- Single representation of the fixed base operations
- A representative from the Chamber of Commerce to represent the commercial interests in the area local to the airport
- Two representatives to represent the local interest groups (such as Luton and District Association for the Control of Aircraft Noise (LADACAN))

Where considered appropriate, subject matter experts and other specialist advisers/consultees will be seconded to assist as necessary. Also, where necessary, independent facilitators will be used to assist in the Group's deliberations.

## **SUBSTITUTES**

Substitutes will be allowed if for any reason an individual member or the nominated representative of an organisation is unable to attend a particular Group meeting or event. The substitute will be required to have the same knowledge and understanding of the matters under consideration and have the same authority as the permanent member.

## **MEETINGS**

The first meeting of the Group (subject to the membership being established) will be held during the week commencing 30 September 2019. The prime purpose of this meeting will be to review and comment on the draft Terms of Reference, the issues upon which the Group will initially focus and the associated work plan. Terms of Reference will be updated and finalised to reflect the agreements reached at this meeting.

Subject to the above, the first working group meeting will take place during the week commencing 7 October 2019.

## **ADMINISTRATION**

Administration will be provided by the LLAL Project Management Office. Meeting agendas and papers will be issued no later than three days prior to the meeting. Minutes will be produced following each meeting and notes summarising the outputs/outcomes of other events.

## **Appendix B**

### **Statement from the Community Groups**

# Community Group responses to “Extract of draft NEDG Final Report –

November 2022”

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## Background to this consultation

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- 1) Noise Envelope Design Group meetings have been subject to the confidentiality restrictions placed on all group members. This limited scope for discussion between the NEDG community representatives and other community groups to general observations about the kinds of metrics being proposed.
- 2) The “Recommendations of the NEDG, Interim Report” to Luton Rising dated 9 October 2020 represents the product of the work of the NEDG including metrics and the control process. This document was not consulted on or circulated to community stakeholders, and is marked “Commercial and in Confidence”.
- 3) Community stakeholders have more recently been given permission to see and comment on an extract from a draft document commenting on the Noise Envelope design process, without seeing the original recommendations of the Group.

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## Context – CAA guidance

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- 4) Community stakeholders take as relevant context the Executive Summary set out in CAP 1129, and its key conclusions, which are reiterated here.
- 5) CAP 1129 sees noise envelopes as aligned with overall government noise policy; balancing growth and noise reduction; and incentivising noise reduction at source through fleet evolution.
- 6) CAP 1129 is clear that the various parameters of a noise envelope serve to restrict inputs, noise exposure or noise impacts. These parameters are expected to have limits so that they do control the noise produced by the associated airport. This in turn enables sharing the benefits of quieter aircraft and provides assurance to stakeholders.
- 7) CAP 1129 specifies that the process of implementing a noise envelope includes obtaining agreement from stakeholders and, once operational, compliance with limits should be monitored and enforced.
- 8) The key conclusions and messages of CAP 1129 are:
  - For an envelope to function as intended, it is essential that full agreement is achieved between all stakeholders on the envelope’s criteria, limit values, means of implementation and enforcement.
  - The benefits of future technological improvements must be shared fairly between industry and local communities. This is fundamental to the noise envelope

concept, and will be considered when defining parameters and setting limits.

- An envelope is likely to be defined by a combination of parameters.
- The life-span of an envelope must be agreed, and its parameters defined to maintain appropriate sharing of the benefits over its intended life-span.
- The parameters and limits, and means of implementation and enforcement of a noise envelope, must be tailored to individual airports and their respective local conditions.
- The current planning system offers limited flexibility in the means available to implement a noise envelope. A change in primary or secondary legislation may be required for noise envelopes to be implemented effectively and enforceable by law.
- A possible need has been identified for independent third parties to assist stakeholders to reach agreement where necessary.

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## Context – planning history

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- 9) The recent planning history at Luton Airport since grant of permission in 2013 to expand throughput from 9.6 to 18mppa by 2028 (subject to controls including an 18mppa passenger cap until 2028 and 92- day summer day and night noise contour limits) is that the Airport breached its noise contour limits in 2017, 2018 and 2019 and reached its passenger cap in 2019. As a result, community stakeholders have lost confidence in the ability of the Airport Operator to control noise, and have seen no other effective measures (including enforcement) to bring noise back within limits apart from the reduction in flight numbers caused as a result of the COVID pandemic.
- 10) Community groups therefore reasonably expect the Luton Rising Noise Envelope design to demonstrate how its parameters and limits will achieve all the objectives of CAP 1129 – particularly by incentivising noise reduction at source through fleet modernisation. This was the stated intention of existing noise contour limits, which were breached so soon after expansion permission as a direct result of the Airport Operator disregarding the modernisation timeframe.
- 11) Community groups require full assurance of independent and effective control – in particular control over the rate of expansion – so that the fundamental imbalance of industry taking the benefits by satisfying demand ahead of delivering noise mitigation is not only redressed but is also not repeated.

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## Executive summary of responses

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- 12) Community stakeholders have significant reservations about whether the current and limited exercise meets the necessary standard for consultation on a noise envelope design.
- 13) Most groups consider it unhelpful to blur the boundary between the noise envelope process and limits, and the separate topic of so-called Green Controlled Growth, and

want to see the parameters and the controls for the Noise Envelope clearly defined in isolation.

- 14) Community stakeholders have little confidence that noise modelling will be accurate due to deficiencies in noise monitoring and modelling at Luton Airport (one already identified by Luton Rising) and a lack of transparency over the calibration of the AEDT model using the data from INM and from the Airport.
- 15) Community stakeholders have little confidence in forecast noise reductions because no information is provided about how the use of quieter aircraft will be incentivised; and next generation aircraft are not likely to be noise-reduced.
- 16) Community stakeholders note that in the period 2014-2019, the Airport took the commercial benefits of growth without delivering sufficient noise mitigation through introduction of less noisy aircraft, and that this deficit needs to be made good before Luton Airport is entitled to share in any future benefits as noise reductions occur through new technology.
- 17) Community stakeholders strongly disagree with the unilateral decision of Luton Rising to depart from the Noise Envelope design put forward in the NEDG interim report – particularly in light of information from the Airport Operator that more flights are likely to occur outside the 92-day summer period.
- 18) Community stakeholders are firmly of the view that effective and independent oversight and scrutiny is required given the recent planning history, and recommend that community representation is included.
- 19) Community stakeholders recommend an initial review after just three years.
- 20) Community stakeholders do not believe that the approach taken to this ‘consultation’ engenders trust.

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## Responses using the headings of the draft document

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### General issues

- 21) Groups in general feel the consultation was difficult or inadequate due to the strict confidentiality imposed; the circulation of just part of a draft report which may still be a work-in-progress; and the extended hiatus in the work of the NEDG after which one of the two community representatives had stepped down without being replaced. It was not clear to some groups where the boundary sits between commenting on the Noise Envelope design process and commenting on Green Controlled Growth, which had to some extent become tangled with it.
- 22) In particular, attention is drawn to the ANPS: *“The applicant should put forward plans for a noise envelope. Such an envelope should be tailored to local priorities and include clear noise performance targets. As such, the design of the envelope should be defined in consultation with local communities and relevant stakeholders...”* This implies an openness of process; noise performance targets being in the plural; and the envelope design, having been defined in consultation, not being unilaterally altered by the applicant.

## **The Noise Envelope and Green Controlled Growth**

- 23) The Noise Envelope is seen by community groups as a set of parameters and processes which are intended to give certainty about noise, which should be evaluated against existing guidance on noise envelopes and in the light of poor performance against the noise control provisions attached to the planning permissions in 2014 and 2017 at Luton Airport.
- 24) Most groups considered it unhelpful to blur the boundary between the Noise Envelope and so-called Green Controlled Growth, and wish to see the parameters and control mechanisms of the Noise Envelope clearly described and delineated in isolation from anything else, not least because there may be a conflict between emissions and noise at below 7000ft. Others note that latest Green Controlled Growth proposals have not yet been seen.
- 25) All groups agree that growth should only occur within the constraints of an appropriate Noise Envelope.

## **New Generation and Next Generation Aircraft**

- 26) Expected noise reductions from New Generation neo aircraft have not matched expectations when in operation at Luton, and Next Generation aircraft technology is not noise-focused. Community groups do not have confidence that noise-at-source benefits will necessarily be delivered, hence effective control measures are essential.
- 27) There is an opportunity to indicate how lower-noise aircraft will be incentivised, yet this has not been done.
- 28) Furthermore, analysis of Luton's annual aircraft noise measurement data for 2018 and 2019 indicates that the benefits assigned to A320neo and A321neo aircraft appear to have been overstated and in any case are assessed by noise monitoring where two out of the three fixed monitor locations do not meet requirements for at least 60° aircraft elevation. Nor is it clear whether or how Luton Rising has accessed radar data since NATS indicates that its radar feeds to an airport are confidential and not transferable.
- 29) Forecasting cannot be guaranteed especially given current economic uncertainty, and latest forecasts for fleet modernisation, carbon costs and fuel costs are likely to change especially since many of the Jet Zero aspirations remain to be proven or delivered in the timeframe of the proposed expansion.

## **The meaning of Sharing the Benefit**

- 30) Communities highlight that APF 3.3 mandates industry to "continue to reduce and mitigate noise as airport capacity grows". This was not the pre-COVID experience at Luton Airport, in fact the reverse: noise impacts substantially increased between 2014 and 2019 in parallel with a near-doubling of throughput. There is a debit to make up before any 50:50 sharing of benefits by industry, and then only "as noise levels fall". The overall situation would otherwise not meet the CAA requirement of fairness.
- 31) No clarity is provided on how or where "noise reduction" from airspace change, or changes to operational procedures, would be defined or measured so as to achieve fair sharing of any benefit. Neither is there any clarity on how "benefits" might be quantified so that a fair sharing can be seen to occur if benefits accrue.



- 32) It is not accepted that 2019, the third successive year in which noise contours were wilfully breached, is an appropriate baseline year for an impact assessment of any future expansion.

### **The Noise Indicators covered by the Noise Envelope**

- 33) Communities strongly disagree with the unilateral decision by Luton Rising to switch to a single metric for the Noise Envelope and to use the other agreed envelope parameters just as reporting measures. Summer noise contours do not capture the impacts of flights outside the 92-day period. Different travel patterns are likely to emerge in response to climate change, and are foreseen in any case by the Airport Operator, so any control which covers just the summer peak is inadequate.
- 34) Furthermore, there is a clear local plan precedent for 57dB LAeq16h and 48dB LAeq8h noise contour levels to be carried forwards from 1999 actuals as defined by the existing INM noise model. There is currently no transparency over how this has been translated into an equivalent contour area under the AEDT model using different contour metric values.
- 35) Luton Airport's accelerated throughput growth from 2014 towards its 18mppa passenger cap disregarded its noise contour limits, and the rate of growth could have exceeded any threshold and limit in one season. Once aircraft slots are issued they cannot easily be rescinded, and the Airport Operator showed no restraint in issuing slots despite forecasts of contour breaches. Community groups therefore regard it as essential to have multiple metrics which can monitor and control rate of growth and rate of noise reduction through fleet modernisation or other means at source, **all** of which must be satisfied and shown to be effective, and to apply across the whole year not just the summer season.
- 36) Given the scale of the proposed expansion, it would be appropriate to ensure the Airport meets Category B noise monitoring and modelling standards as defined by CAP 2091. Community groups agree the proposal to install additional monitors but emphasise that fixed monitors NMT2 and NMT3 should be replaced by a single monitor properly situated beneath the centreline, and an additional 6.5km monitor provided to monitor Runway 07 arrivals noise.

### **Environmental Scrutiny Group and Enforcement**

- 37) Given the history of repeated breaches without enforcement, community groups are firmly of the view that independent and legally empowered oversight and scrutiny is essential, involving the joint host authorities not just the LPA, and that any agreements governing growth rate must be enforceable.
- 38) A suitably skilled community group representative should be included on the Noise Technical Panel and/or Noise Working Group as appropriate.
- 39) Community groups also regard it as essential that a report be completed and reviewed to assess whether the proposed Noise Envelope (once restored to what had previously been agreed) would have prevented the noise contour breaches in 2017-2019. If necessary, the Noise Envelope design should be strengthened, until shown to

be capable of preventing that occurrence.

- 40) Five-yearly reviews should be supplemented by intermediate reviews if there is a relevant change which would impact the operation or effectiveness of the Noise Envelope in the view of a majority of the ESG, or if targets for noise reduction are missed, or if a threshold exceedance is not brought under control by the following year. Such a relevant change may include policy changes governing carbon emissions as well as noise.
- 41) It would be prudent to have an initial review after just 3 years given that a noise envelope has not been operated at Luton before, and after 3 years previous planning controls were forecast to be breached.

### **Final remarks**

- 42) We draw attention to the CAA conclusions listed above in respect of noise envelopes. The confidential nature of the release of a partial and draft document does not engender trust, and for all the reasons given in this consolidated response, the proposals as set out in that partial draft are not agreed by the community group stakeholders.

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### **Respondee**

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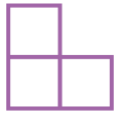
BATPC (Bedfordshire Association of Town and Parish Councils)  
BMKALC (Buckinghamshire and Milton Keynes Association of Local Councils)  
HAPTC (Hertfordshire Association of Parish and Town Councils)  
LADACAN (Luton And District Association for the Control of Aircraft Noise)  
STAQS (St Albans Quieter Skies)  
STAND (St Albans Aircraft Noise Defence)  
Harpenden Sky  
PAIN (People Against Intrusive Noise)  
The Preston Trust  
The Hitchin Forum  
The Harpenden Society  
SLFFL (Stop Low Flights From Luton)

NB: the community group SLAE (Stop Luton Airport Expansion) declined to participate in the consultation due to their lack of trust in Luton Rising.

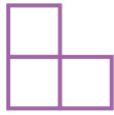
**Consolidated response compiled by Andrew Lambourne, LADACAN, 5 December 2022**

## **Appendix C**

### **Statement from the Airport Operator**



7<sup>th</sup> December 2022



Dear Martin,

CC: Stephen Turner and Susan Hall (NEDG Secretary)

NEDG Final Report



**London Luton Airport**

Percival House,  
Percival Way, Luton,  
Bedfordshire, LU2 9NU

T: +44 (0)1582 405 100

W: london-luton.co.uk

Please accept this letter as LLAOL's response to the draft NEDG report, November 2022.

We wish to have this letter recorded as our formal response to the final version of the NEDG report to ensure it appropriately reflects the concerns raised by LLAOL as the operator.

Below is a list of LLAOL's concerns, numbered as per the paragraphs in the draft report:

Para 9 – This should state 'the majority of the NEDG agreed that the following indicators should be included in the Noise Envelope' as LLAOL does not agree with inclusion of all indicators. LLAOL disagrees with setting departure noise limits according to certificated departure noise performance as this does not encourage operators to modernise their fleets towards quieter aircraft. This scenario was observed in 2014 when a similar indicator was part of the planning permission and acted as a disincentive for operators to modernise their fleets, since this would have made noise violation limits lower. Our preferred approach would be to set departure noise violation limits that gradually reduce for all operations over time, as is the case today and can be evidenced as effective through the increase in modernisation at LLA.

Para 10 – LLAOL believes only the number of households and population should be reported for LAEQ contours, and therefore this should be specified on page 7. LLAOL believes this information is the most important for monitoring the SOAEL and LOAEL, as well as any noise insulation schemes. This is in line with other airports reporting requirements. Population data for the Number above contours seems excessive on an annual basis. LLAOL currently produces 10 contours per year. To run an additional 18 contours with population counts included is excessive and would not yield any additional information above what is already produced. Population counts are currently produced for LAEQ contours which we believe is the appropriate approach.

Para 12 – LLAOL believes there should be a review of the Noise Envelope but this does not need to be undertaken by the current NEDG group.

LLAOL understands this is the role of the Technical Panel feeding into ESG (Environmental Scrutiny Group) as mentioned by Luton Rising (LR) in December 2021. The NEDG was established to inform the creation of the DCO application in respect of noise and was not intended to be an ongoing governance body beyond this activity being completed.

**Para 38** – The GCG is going to be a legally binding framework of measures that the airport operators will need to work within in order to grow, which incorporates the Noise Envelope. It will therefore be part of ongoing reporting which would be included on an annual basis

within the monitoring report that would be reviewed by the Noise Technical Panel and the ESG. It therefore is not relevant to consider this as a discrete entity.

**Paras 41-47** – LLAOL agrees with the LR approach to sharing the benefits, and would recommend changes to these paragraphs stating that ‘the majority of NEDG members recommend’ rather than ‘NEDG recommend’. As LLAOL is in a minority we would request our views to be added to para 58 in the report.

**Para 49** – As per para 9 amendments, LLAOL does not agree there should be departure noise limits according to noise certification as this creates a disincentive to modernise the fleet. This point was made in the interim NEDG report regarding this metric and therefore we would prefer this para to read ‘the majority of NEDG members believe that such an approach is not unreasonable’. As LLAOL is in a minority we would request our views to be added to para 58 in the report.

**Para 58** – LLAOL would like the concerns listed in this letter to be detailed in this section of the report.

LLAOL believes the report should state that not all members agreed with the final recommendations, and sign post the reader to the concerns of LLAOL as operator detailed in paragraph 58 as otherwise it is not an accurate reflection of the position.

Yours sincerely,

Nicole Prior

Head of Flight Operations

# 1 ANNEX B – APPLICANT RESPONSE TO NOISE ENVELOPE DESIGN GROUP FINAL REPORT

## 1.1 Introduction

1.1.1 This document sets out the Applicant’s response to recommendations in the Noise Envelope Design Group (NEDG) Interim and Final Reports.

## 1.2 Summary of NEDG recommendations and Applicant response

1.2.1 The Applicant is pleased to note that there are a large number of recommendations from the NEDG that have been accepted and adopted in the Noise Envelope proposals. Whilst the Applicant has carefully considered all ~~of the~~ recommendations from the NEDG, there are some recommendations which have not been adopted, and in such cases the Applicant has developed alternative proposals based upon relevant best practice, guidance and policy. A summary of the NEDG recommendations and the Applicant responses are provided in ~~Table 1.1~~Table 1.1~~Table 1.1~~, with further detail provided in the following sub-sections as necessary.

Table 1.1: Summary of NEDG recommendations and Applicant response

NEDG Recommendation	Applicant response
The Noise Envelope should be a discrete entity, separate from Green Controlled Growth	<p>This recommendation has not been adopted as there are benefits in avoiding the need for duplication of processes and enforcement bodies and providing consistency across the four topics covered by the GCG Framework (noise, air quality, carbon and traffic &amp; transport).</p> <p>For further detail on this response, see <b>Section 1.3, Paragraph 1.3.2.</b></p>
Limits should be based on the area enclosed by the summer average 54dB <sub>L<sub>Aeq,16h</sub></sub> contours for day and 48dB <sub>L<sub>Aeq,8h</sub></sub> contours	Agreed and adopted in the Noise Envelope
A number of different indicators (including movement caps, quota count caps and noise violation limits) should form Limits in the Noise Envelope	<p>This recommendation has <del>not</del> been <u>fully partially</u> adopted. Whilst all the additionally recommended metrics have been included as monitoring and reporting metrics, they have not been included as Noise Envelope Limits, <u>though the majority of the recommended noise indicators have been secured as additional controls in the Air Noise Management Plan [TR020001/APP/8.125d9 ref].</u></p>

NEDG Recommendation	Applicant response
	<p><u>Whilst there are additional noise controls in the Air Noise Management Plan [TR020001/APP/8.125d9-ref], in order to have a clear and unambiguous measure of compliance with the Noise Envelope, it is necessary to use a single indicator for daytime and night-time Limits in line with policy and CAA guidance, and that indicator should best describe aircraft noise annoyance and health impacts on the communities.</u></p> <p>For further detail on this response, see <b>Section 1.3, Paragraph 1.3.13.</b></p>
<p>Contour areas should be used to set Thresholds and Limits, without including contour shapes and/or measures of population exposure, as both of these are influenced by factors outside of the control of the airport operator.</p>	<p>Agreed and adopted in the Noise Envelope</p>
<p>Modelling should be undertaken using AEDT software</p>	<p>Agreed and adopted in the Noise Envelope</p>
<p>Contours should be calculated using an average modal split of runway operations (a fixed percentage, taken from historic averages), but single mode contours should also be reported, along with the contours with the actual modal split for a given year.</p>	<p>Agreed and adopted in the Noise Envelope</p>
<p>Threshold values should be defined as well as Limits to provide a more robust control mechanism.</p>	<p>Agreed and adopted in the Noise Envelope</p>
<p>Limits and Thresholds should evolve over time to provide sharing of future noise benefits from technological improvements</p>	<p>Agreed and adopted in the Noise Envelope</p>
<p>The Noise Envelope should be regularly reviewed and should be reviewed if there were to be any significant changes to the airport's operations. -Such a change might include the anticipated modernisation of airspace.</p>	<p>Agreed and adopted in the Noise Envelope</p> <p>For further detail on this response, see <b>Section 1.3, Paragraph <u>1.3.251.3.251.3.28.</u></b></p>

NEDG Recommendation	Applicant response
<p>The NEDG has recommended that wherever technology assists in reducing the noise impact, the principles of sharing the benefit through the Noise Envelope should apply. Hence, this would apply to changes in airspace as well as future technological improvements in aircraft noise emissions</p>	<p>Agreed and adopted in the Noise Envelope</p> <p>For further detail on this response, see <b>Section 1.3, Paragraph 1.3.5.</b></p>
<p>The NEDG has noted that whilst there was an indication that when technological improvements do transpire there would be an equal sharing of benefit, this has not been clearly set out. Hence the NEDG recommends that this is stated explicitly.</p>	<p>This recommendation has not been fully adopted. Whilst clear mechanisms have been defined for how benefits of technological improvements will be shared between communities and the airport (and worked examples have been provided), the precise proportions of sharing between communities and the airport in future reviews of the Noise Envelope Limits have not been predefined. This is because this would be dependent on the details which are not available at the current time. For example, the economic implications of future growth or the actual noise benefit compared to the carbon reduction of future aircraft.</p> <p>For further detail on this response, see <b>Section 1.3, Paragraph 1.3.5.</b></p>
<p>The NEDG recommend that, to make the Noise Envelope meaningful and effective, enforcement and independent scrutiny should be legally watertight. The NEDG recommended that the Applicant should demonstrate how historic breaches may have not occurred if the Noise Envelope proposals were in place</p>	<p>Agreed and adopted in the Noise Envelope. A narrative description of how the Noise Envelope proposals should have avoided historic noise limit breaches has been provided.</p> <p>For further detail on this response, see <b>Section 1.3, Paragraph <u>1.3.281-3.281-3.34.</u></b></p>

### 1.3 Further detail on the Applicant’s responses to NEDG recommendations

1.3.1 This section sets out further detail on the Applicant’s response to the NEDG recommendations as summarised in **Table 1.1Table 1.1Table 1.1.**



## Green Controlled Growth (GCG) Framework.

- 1.3.2 NEDG has requested that the Noise Envelope is 'standalone' and is not integrated into the GCG Framework.
- 1.3.3 First it is important to note that the design and content of the Noise Envelope is not affected by its inclusion within the GCG Framework, and it is considered that the benefits of integration outweigh the additional 'visibility' that NEDG suggest would result from having a standalone Noise Envelope.
- 1.3.4 The key advantages of integrating the Noise Envelope within GCG Framework are that the enforcement, control and reporting processes set out within GCG will automatically apply to the Noise Envelope, avoiding the need for duplication of processes and enforcement bodies and providing consistency across the four topics covered by the GCG Framework (noise, air quality, carbon and traffic & transport). The noise Technical Panel that would be formed under the GCG Framework allows for suitable independent technical expertise to be involved in the review and enforcement processes without the need for separate arrangements to those in GCG for a stand-alone Noise Envelope.

## Sharing of Benefits

- 1.3.5 The NEDG final report identifies that the NEDG expects noise benefits from new generation aircraft currently transitioning into the fleet operating at the airport or noise benefits from an approved Airspace Change Proposal to be shared between the community and the airport operator.
- 1.3.6 Whilst the economic benefit of growth is a factor that must be considered when 'sharing the benefits', **Section 3.3** of this appendix sets out how the proposed Noise Envelope 'shares the benefits' in line with policy (specifically in terms of noise) as summarised below.
- 1.3.7 Noise Envelope Limits are always set below the 2019 Actuals baseline for daytime and night-time and are always set below the 2019 Consented baseline for the daytime ~~from 2029 onwards~~. The noise limits decrease in five year intervals up to 2039. This demonstrates that benefit is being shared with the communities and that noise contour areas are reducing, despite growth at the airport (i.e. demonstrating a balance between the airport and communities).
- 1.3.8 The Noise Envelope also contains a mechanism for the Noise Limits to be reviewed and reduced in future years (beyond the 2030s) if and when an approved Airspace Change Proposal provides noise benefits and/or quieter 'next generation' aircraft become available that would enable lower noise levels to be achieved and the benefit shared between the airport and communities. This Noise Limit Review process will:
- a. permit the Proposed Development airport growth;
  - b. reduce the Noise Limits and corresponding Thresholds if reasonably practicable; and
  - c. where (b) identifies opportunities to reduce Noise Limits and corresponding Thresholds, reduce the Noise Limits so they are below the 2019 Consented baseline as quickly as is reasonably practicable to

share the benefits of the technology improvement with the communities affected by aircraft noise.

- 1.3.9 This process shows how the noise benefits from new generation aircraft (existing technology coming into the fleet) or noise improvements from an approved Airspace Change Proposal is shared between the airport operator and communities. The insets in **Section 3.3** demonstrate that 'sharing the benefit' can be achieved with reference to the 2019 Consented baseline for the daytime, as the Noise Envelope Limits are always set below the 2019 Consented baseline ~~from 2029 onwards~~. 'Sharing the benefit' can be demonstrated for the night-time for the slower growth scenario from 2029 onwards.
- 1.3.10 The reducing noise contour area limits up to ~~2034-2039~~ have been set within the Noise Envelope so that the community benefits from the noise reductions associated with new generation aircraft. Beyond this point, the review mechanism built into GCG for the noise limits has been set up to provide sharing of any noise benefits which result from next generation aircraft and/or future airspace changes.
- 1.3.11 The precise proportions of sharing between communities and the airport operator in future reviews of the Noise Envelope Limits have not been predefined, as it is considered that these would be dependent on the details which are not available at the current time. For example, the economic implications of future growth or the actual noise benefit compared to the carbon reduction of future aircraft.
- 1.3.12 However, it is important to note that any changes to the Noise Envelope Limits through the process set out in GCG would be subject to agreement with an independent group (the Environmental Scrutiny Group - ESG), and hence control over how benefits are shared would be subject to independent scrutiny in the future.

## Noise Indicators

- 1.3.13 It is noted that the NEDG members recommend a number of different indicators form part of the Noise Envelope, as set out in the NEDG Interim Report.
- 1.3.14 First it is important to note that all of the indicators recommended in the NEDG Interim Report are included in the GCG Framework, either as Thresholds and Limits or within the Aircraft Noise Monitoring Plan (**Appendix C** of the **Green Controlled Growth Framework [TR020001/APP/7.08REP3-023]**) to inform community engagement and airport noise management.
- 1.3.15 **Table 1.2** ~~Table 1-2~~ presents a summary of the Noise Envelope Design Group (NEDG) Final Report recommendations for noise controls and how they have been adopted in the DCO. The table demonstrates that the only recommendation that is not at least partially adopted is the recommendation of an annual movement cap. The justification for this is provided in Section 2.5 of the **Applicant's position on contour and movement limits [TR020001/APP/8.184d9-ref]**. It is notable that whilst shoulder period limits

were discussed, the NEDG did not recommend shoulder period limits in their Interim or Final report recommendations.

**Table 1.2: Summary of NEDG recommendations and DCO noise controls**

<b><u>NEDG recommendation – control measure and time period</u></b>	<b><u>NEDG recommendation - Limit</u></b>	<b><u>DCO noise control</u></b>
<u>Night-time Quota Period – Movement Cap</u>	<u>9,650 movements over 12-month rolling average</u>	<u>Recommendation fully adopted - 9,650 movement limit Secured in the <b>Air Noise Management Plan [TR020001/APP/8.125d9-ref]</b></u>
<u>Night-time Quota Period – QC Cap</u>	<u>12-month rolling average</u>  <u>Value to be determined</u>	<u>Recommendation fully adopted - 3,500 Quota Count limit secured in the <b>Air Noise Management Plan [TR020001/APP/8.125d9-ref]</b></u>
<u>Annual Movement Cap</u>	<u>12-month rolling average</u>  <u>Value to be determined</u>	<u>Recommendation not adopted – see Section Section 2.5 of the <b>Applicant’s position on contour and movement limits [TR020001/APP/8.184d9-ref]</b> for justification</u>
<u>Average Summer Day – Daytime contour area Limit</u>	<u>Area enclosed by 54dBL<sub>Aeq,16h</sub> contour.</u>  <u>Numerical value to be determined</u>	<u>Recommendation fully adopted – 54dBL<sub>Aeq,16h</sub> contour area Limit and Thresholds secured in the <b>Green Controlled Growth Framework Green Controlled Growth Framework-[TR020001/APP/7.0d9-re8f]</b>.</u>
<u>Average Summer Day – Night-time contour area Limit</u>	<u>Area enclosed by 48dBL<sub>Aeq,8h</sub> contour.</u>  <u>Numerical value to be determined</u>	<u>Recommendation fully adopted – 48dBL<sub>Aeq,8h</sub> contour area Limit and Thresholds secured in the <b>Green Controlled Growth Framework [TR020001/APP/7.08d9-ref]</b>.</u>
<u>Noise Violation Limits</u>	<u>Noise violation limits to be applied at current locations.</u>  <u>Limit values to be graded based on</u>	<u>Recommendation partially adopted – departure Noise Violation Limits secured in <b>Air Noise Management Plan [TR020001/APP/8.125d9-ref]</b> with Limits that reduce over time rather than being graded based</u>

	<u>departure QC of aircraft.</u>	<u>on QC. See [TR020001/APP/8.12REP6-0562] for justification.</u>
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~~1.3.14 — Whilst there are additional noise controls in the~~

~~1.3.15 — The following indicators recommended by NEDG to be included in the Noise Envelope have been included in the Aircraft Noise Monitoring Plan:~~

~~a. — Total annual number of Air Traffic Movements in the night-time quota period.~~

~~b. — Total annual Quota Counts (QC) in the Night Quota (2330-0600), night-time (2300-0700) and daytime (0700-2300) periods.~~

~~c. — Total annual number of Air Traffic Movements.~~

~~d. — Departure Noise Limits at the current monitoring locations, using a set limit for all operations that gradually reduces over time.~~

~~1.3.16 — With regard to a), the Applicant is committed to maintaining the existing cap on night-time quota period (2330 to 0600) movements (9,650 movements over a 12-month period) and this will be secured as a Requirement to the DCO. The Aircraft Noise Monitoring Plan requires the monitoring and reporting of Air Traffic Movements during the night-time quota period (2330 to 0600).~~

~~1.3.17 — With regard to d), the NEDG recommendation was that departure noise limits should be graduated according to the certificated departure noise performance of the different aircraft types. However, as set out in the NEDG Interim report in section 2.3.2, departure noise limits graduated according to certified performance would not provide incentivisation for the adoption of quieter aircraft. This scenario was observed in 2014 when a similar indicator was part of the planning permission and acted as a disincentive for operators to modernise their fleet, as it would have made noise violation limits lower. The alternative approach, to encourage the uptake of quieter aircraft and encourage the quietest possible operation for the noisiest aircraft (those more likely to be subject to fines), is to set departure noise violation limits that gradually reduce for all operations over time, as is the case today.~~

~~1.3.18 — With regard to b), c) and d), these indicators will be reported on, but are not set as Limits and Thresholds in the Noise Envelope because:~~

~~a. — the use of multiple noise indicators to control the same outcome (noise impacts from the airport on the community) would result in an unnecessarily complex and ambiguous control mechanism;~~

~~b. — indicators b) and c) above are measures of ‘input’ rather than the impact of noise on the community and are poorly correlated with noise impact;~~

~~c. — government guidance (Ref. 5) is to define Noise Envelope limits / caps based on either LAeq noise contour areas or Quota Counts (QC); and~~

~~d. — departure noise limits form part of the suite of management tools that the airport operator will use to comply with the Limits in the Noise Envelope and these may need to be adjusted and optimised as the airport grows and monitoring~~

~~arrangements are further developed in line with the Aircraft Noise Monitoring Plan.~~

~~4.3.19~~**4.3.16 Air Noise Management Plan [TR020001/APP/8.125d9-ref]**Hence, in order to have a clear and unambiguous measure of compliance with the Noise Envelope, it is necessary to use a single indicator for daytime and night-time Limits and that indicator should best describe aircraft noise annoyance and health impacts on the communities.

~~4.3.20~~**4.3.17** With regard to aircraft noise annoyance and health impacts, the CAA published updated information in 2021:

- a. CAP 1506 Survey of Noise Attitudes 2014: Aircraft Noise and Annoyance, Second Edition (Ref. 12).
- b. CAP 2161 Survey of Noise Attitudes 2014: Aircraft Noise and Sleep Disturbance (Ref. 13).

~~4.3.21~~**4.3.18** These reports present the relationship between different noise indicators and annoyance and health effects.

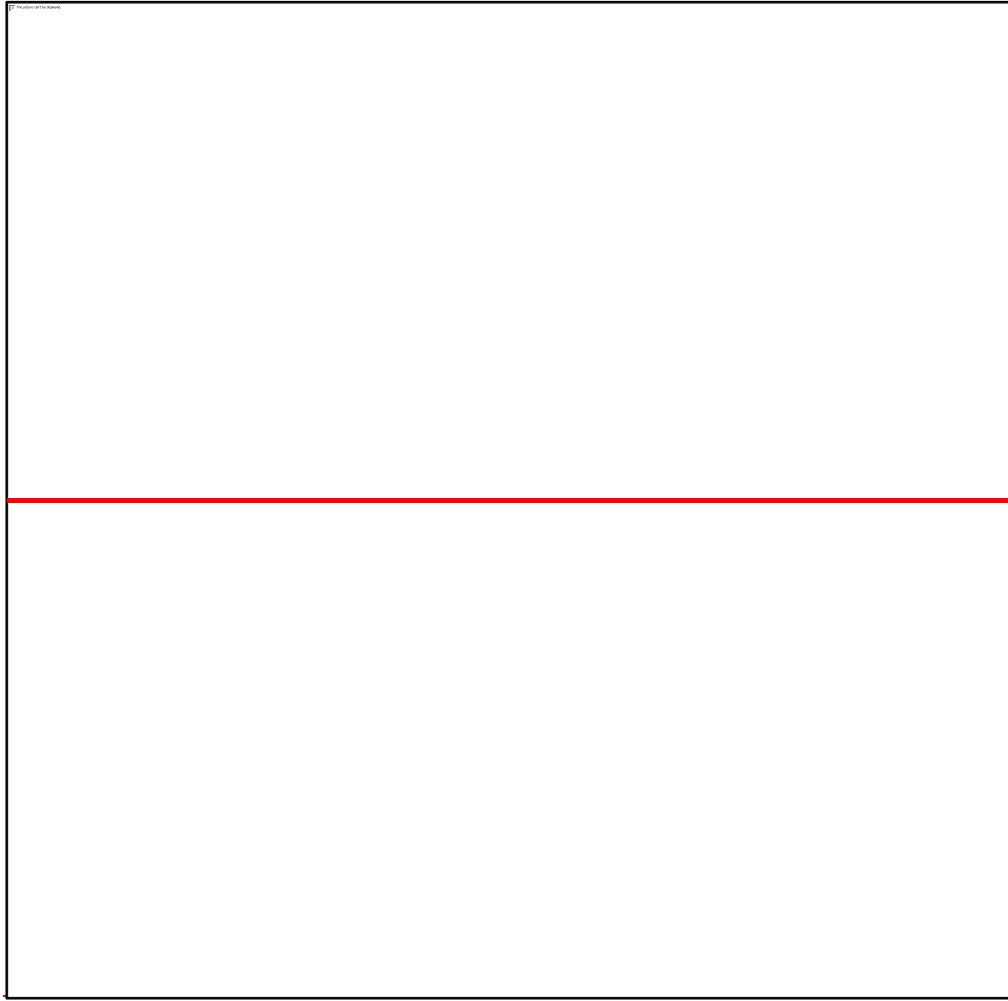
~~4.3.22~~**4.3.19** CAP 1506 concludes:

## Inset 1.1: Extract from CAP1506

### **Is $L_{Aeq,16h}$ still the most appropriate indicator to use to estimate the annoyance arising from aircraft noise?**

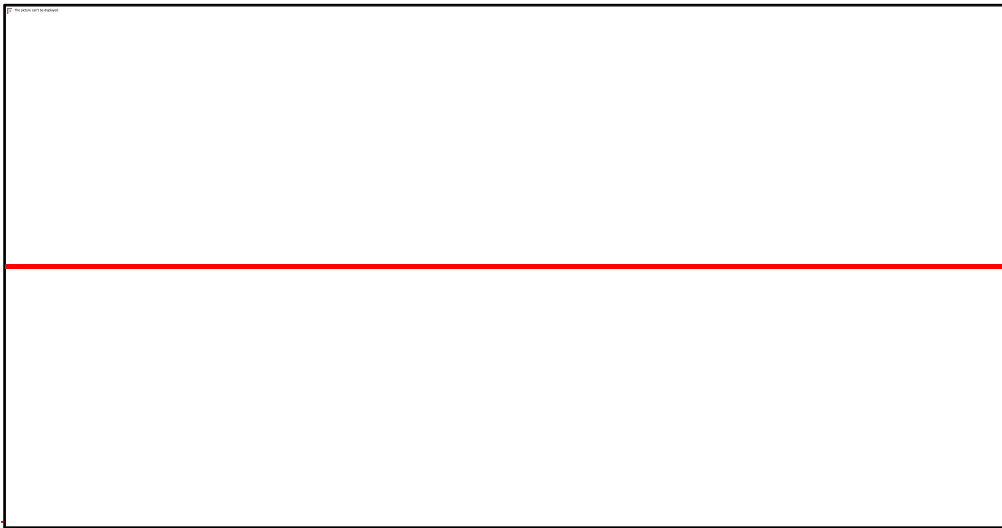
- 8.7 The study compared reported mean annoyance scores against average summer-day noise exposure defined using four different noise indicators:  $L_{Aeq,16h}$ ,  $L_{den}$ , N70 and N65.
- 8.8 Evidence was found that mean annoyance score correlated well with average summer day noise exposure,  $L_{Aeq,16h}$  ( $r^2=0.87$ ). There was no evidence found to suggest that any of the other indicators  $L_{den}$ , N70 or N65 ( $r^2=0.66-0.73$ ) correlated better with annoyance than  $L_{Aeq,16h}$ .
- 8.9 Having said this, the study recognises that residents can struggle to understand the concept of a time-averaged metric such as  $L_{Aeq,16h}$  and  $L_{den}$  and the fact that it is measured and reported on a logarithmic scale where a change of 3 dB represents a doubling or halving of noise energy.
- 8.10 There is, therefore merit in considering greater use of 'Number Above' metrics as supplemental indicators to help portray noise exposure, but recognising that evidence-based decisions should continue to use  $L_{Aeq,16h}$ . In this context N65 is preferred over N70 as noise events in many areas are already beginning to occur at levels less than 70 dB  $L_{ASmax}$  and are forecast to reduce over time.





**1.3.23** **1.3.20** CAP 2161 concludes:

Inset 1.2: Extract from CAP2161



**Is  $L_{Aeq,8h}$  an appropriate indicator to use to estimate self-reported sleep disturbance arising from aircraft noise?**

- 8.8 The study compared reported mean night-time disturbance scores against average night noise exposure defined using three different noise indicators: average summer night  $L_{Aeq,8h}$ , annual average night  $L_{night}$ , and average summer night N60.
- 8.9 All three noise indicators are highly correlated with night-time self-reported sleep disturbance ( $r^2=0.822-0.883$ ). The  $r^2$  for  $L_{night}$  (0.842) was slightly lower than for  $L_{Aeq,8h}$  (0.883). It is plausible that  $L_{night}$  is inferior to  $L_{Aeq,8h}$  as both Gatwick and Stansted airports experience significant seasonality with greater numbers of night flights during the summer months. N60 is found to correlate almost as well as  $L_{Aeq,8h}$  and  $L_{night}$ . Based on this exploratory analysis, there is insufficient evidence to change from the current practice of using average summer night  $L_{Aeq,8h}$  noise exposure for UK assessments.

**1.3.24** **1.3.21** Additionally, to inform the Government’s Aviation 2050 strategy, the CAA were commissioned to undertake an analysis of noise forecasts and a consideration of how airport noise may be limited. CAP 1731 (Ref. 14) reports on these analyses and presents a feasibility study of implementing airport noise limits nationally and locally, including consideration of the pros and cons that noise limits may create and recommendations for appropriate metrics for noise limits.

**1.3.25** **1.3.22** On the recommendation of metrics for noise limits, CAP 1731 concludes (in section 7.6) that proposed noise limits should consist of: “A *locally set absolute Quota Count or noise contour area limit at a particular noise level for both day and night for each airport*”

~~1.3.26~~1.3.23 With respect to Number Above metrics, CAP 1731 says (in Section 7.6):  
*“Given that Number Above lacks an ability to restrict population exposure, it is not recommended as a main noise limit. However, Number Above are recognised as a useful supplementary noise metric and it is recommended as a KPI to be monitored at each airport.”*

1.3.24 This supports the Applicant’s decision to define noise Thresholds and Limits in terms of the summer average daytime  $L_{Aeq,16h}$  indicator and the night-time  $L_{Aeq,8h}$  indicator and to monitor and report additional indicators (including N65 and N60) as part of the binding Aircraft Noise Monitoring Plan.

~~1.3.27~~

## Review Period

~~1.3.28~~1.3.25 In response to NEDG Final Report, the Noise Envelope (as part of the GCG Framework, see **Green Controlled Growth Explanatory Note [TR020001/APP/7.07REP3-015]**) requires the airport operator to undertake a Noise Limits Review in response to a change in circumstances triggered by either a) an approved Airspace Change Proposal and / or b) the publication of a new International Civil Aviation Organization (ICAO) Noise Chapter that will confirm the noise performance of the next-generation of aircraft (the first generation of low carbon aircraft). For a new ICAO noise chapter and associated new aircraft technology, the Noise Limit Review would present proposed Noise Limit and Threshold reductions from 2039 onwards in five-year steps based on the alternative noise forecast and discussions with the Noise Technical Panel.

~~1.3.29~~1.3.26 The CAA’s CAP 1616 Airspace Change Process (Ref. 15), sets out process for developing, consulting on and approving Airspace Change Proposals (ACP). In line with the governments Air Navigation Guidelines, this includes meeting governments aviation and noise policy and includes the requirement to publish noise information as part of consultation.

~~1.3.30~~1.3.27 With regard to airspace change, it should also be noted that:

- a. Airspace change is happening across the south of England as a result of Governments Future Airspace Strategy Implementation – South (FASI-S).
- b. As set out at Statutory Consultation for the airport’s proposed expansion and in the proposals for the Noise Envelope, airspace change will have to be delivered in line with the Noise Envelope (as part of the GCG Framework). This is why the Noise Limits are expressed as noise contour areas, rather than contour shapes, and is one reason why the noise assessment and consequent noise limits have to be set on a reasonable worst-case basis. **Chapter 16** Noise and vibration of this ES **[TR020001/APP/5.01]** includes a sensitivity test to support this and provides more information on the approach to reasonable worst-case assessment.
- c. There will be a public consultation as part of ACP stage 3 (timelines for this are still to be confirmed), that must include noise impact information.

## Enforcement

- 4.3.31.1.3.28** The Applicant notes that the NEDG welcomes the proposals for an independent group (the Environmental Scrutiny Group - ESG) that will hold the airport operator to account with regard to its environmental performance and the concept of setting up of a noise Technical Panel to inform ESG decision making.
- 4.3.32.1.3.29** The NEDG Final Report seeks certainty that the ESG would have the necessary authority to prevent the airport operator from exceeding the prescribed limits and that the Noise Envelope and GCG Framework would avoid limits being breached as they were between 2017 and 2019.
- 4.3.33.1.3.30** The Noise Envelope is part of the innovative GCG Framework. The GCG Framework sets Thresholds and Limits (for noise this is part of the Noise Envelope). -A fundamental principle of the GCG Framework is that, as the magnitude of noise effect increases, a series of checks are implemented as the airport continues to grow. This is intended to ensure that the extent to which an effect is occurring can be controlled as it approaches a GCG Limit, with the ultimate intention that the Limit is not exceeded.
- 4.3.34.1.3.31** While environmental effects remain below all Thresholds and Limits, the airport will operate as it does today, subject to ongoing monitoring and reporting of environmental effects as required by the GCG Framework, and any other requirements of the DCO.
- 4.3.35.1.3.32** If noise rises above the Thresholds, increasing action and oversight by the ESG and noise Technical Panel is triggered to avoid the Limit being breached. The GCG Framework summarises the process using a diagram that is reproduced here as **Inset 1.3****Inset 1.3****Inset 1.3**.
- 4.3.36.1.3.33** Forward planning is key to avoiding breaches as much as the retrospective annual compliance monitoring and reporting required by GCG. To support this, once notice has been served to implement the Proposed Development under Article 43(1) of the Draft Development Consent Order [**REP3-003TR020001/APP/2.01d9-ref**], the airport operator will adopt the AEDT noise model used to prepare the Environmental Statement. This 'DCO noise model' will then be maintained and used as the basis for planning for growth and noise control at the airport to ensure that future noise forecasts can be consistently compared with the noise Limits and Thresholds set by the DCO using the same model (comparing 'like with like'). The model will also be subject to the periodic review, which creates the opportunity to supersede previously agreed monitoring methods where agreed between ESG and the airport operator (please refer to the Aircraft Noise Monitoring Plan in **Appendix C** of the **Green Controlled Growth Framework** [**REP3-023TR020001/APP/7.08d9-ref**]).
- 4.3.37.1.3.34** Once notice has been served to implement the Proposed Development under Article 43(1) of the Draft Development Consent Order [**TR020001/APP/2.01**], the airport operator will review, and as necessary update, the noise forecasts every five years. This review period aligns with the ongoing need under the Environmental Noise Regulations (Ref. **998**) to publish strategic noise maps and a Noise Action Plan (NAP) every five years starting in

2008. The Noise Envelope five-year periods are aligned with NAP five-year periods (i.e. 2023-2028, 2029-2033, 2034-2038 etc).

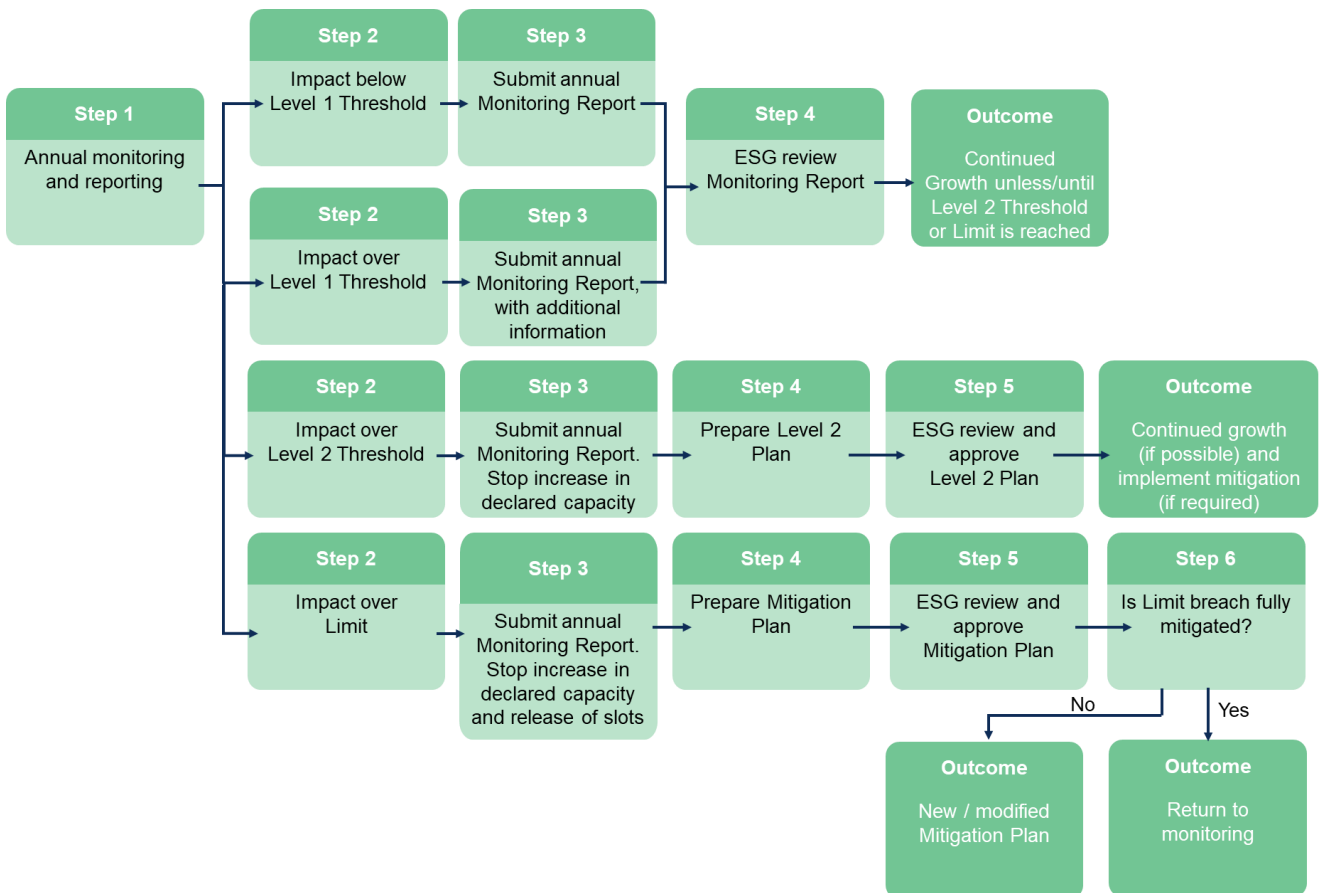
**1.3.381.3.35** The airport operator will review and as necessary update its noise forecasts around the mid-point of each five-year period (e.g. 2027, 2032, 2037 etc). This will support preparation for the following five year-period and, as necessary, any Level 2 Plan or Mitigation Plan required by the GCG Framework (see section 2.2 of the **GCG Explanatory Note [REP3-015TR020001/APP/7.07d9-ref]**).

**1.3.391.3.36** By planning over a longer horizon, in line with GCG Framework Limits, the forecasts will support the airport operator working with the airlines to plan their growth and fleet deployment at the airport.

**1.3.401.3.37** The five-yearly noise forecast updates will be reviewed by the GCG Noise Technical Panel in relation to any Level 2 Plan or Mitigation Plan.

**1.3.411.3.38** These are the key features of the Noise Envelope, combined with the ESG and noise Technical Panel oversight, that will ensure compliance with the Noise Envelope.

**Inset 1.3 Proposed GCG approach**



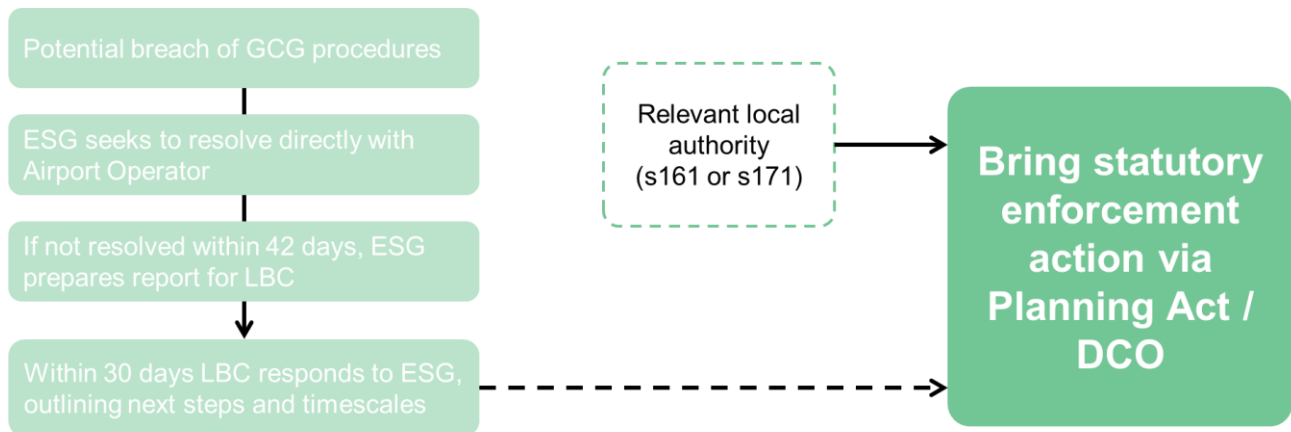
**1.3.421.3.39** The **Green Controlled Growth Explanatory Note [REP3-015TR020001/APP/7.07d9-ref]** also states that where the Noise Envelope Limits or the GCG Framework process is not complied with then the ESG should first provide formal notice to the airport operator that they consider a breach has taken place and attempt to resolve this issue directly with the airport

operator prior to formal enforcement action being triggered. Where this does not resolve a breach then the ESG may initiate enforcement action.

**1.3.43** **1.3.40** The mechanism by which statutory planning enforcement takes place for development consent orders is set out in Part 8 of the Planning Act 2008 (Ref. 16). It should be noted that the “relevant planning authority” (as defined in s173 of the Planning Act 2008) is able to take a number of steps. The “relevant planning authority” will be Luton Borough Council. However, it is also open for other planning authorities to bring action either through a private prosecution of an offence under section 161, or potentially by way of injunction under section 171 of the Planning Act 2008.

**1.3.44** **1.3.41** The GCG Explanatory Note summarises the approach in a diagram that is reproduced here as **Inset 1.4**~~Inset 1.4~~~~Inset 1.4~~.

Inset 1.4: Proposed approach to enforcement as set out in the GCG Framework



## REFERENCES

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- Ref 1 Her Majesty's Stationery Office (2013), The Aviation Policy Framework.
- Ref 2 Department for Environment Food and Rural Affairs (2010), Noise Policy Statement for England
- Ref 3 Department for Communities and Local Government (2019), Planning Practice Guidance: Noise.
- Ref 4 Department for Transport (2018). Airports National Policy Statement: new runway capacity and infrastructure at airports in the South East of England.
- Ref 5 Department for Transport (2018), Aviation 2050 – the future of UK aviation.
- Ref 6 Department for Transport (2022), Flightpath to the future: a strategic framework for the aviation sector.
- [Ref 7 Department for Transport \(2023\), Policy Paper: Overarching Aviation Noise Policy](#)
- Ref 8 Civil Aviation Authority (2013), CAP1229 Noise Envelopes
- Ref 9 Her Majesty's Stationery Office (2006), The Environmental Noise (England) Regulations.
- Ref 10 Department for Communities and Local Government (2017), *Cranford Appeal Decision Letter APP/R5510/A/14/2225774*
- Ref 11 Transport Research Laboratory Ltd (2002), Converting the UK traffic noise index LA10,18h to EU noise indices for noise mapping
- Ref 12 Civil Aviation Authority (2021), CAP1506 Survey of Noise Attitudes 2014: Aircraft Noise and Annoyance, Second Edition
- Ref 13 Civil Aviation Authority (2021) CAP2161 Survey of Noise Attitudes 2014: Aircraft Noise and Sleep Disturbance
- Ref 14 Civil Aviation Authority (2019), CAP1731: Aviation Strategy: Noise Forecast and Analyses, Version 2
- Ref 15 Civil Aviation Authority (2021) CAP1616 Airspace Change Guidance on the regulatory process for changing the notified airspace design and planned and permanent redistribution of air traffic, and on providing airspace information
- Ref 16 Her Majesty's Stationery Office (2008) The Planning Act