

London Luton Airport

Planning Application 12/01400/FUL: Noise

Report 13/1720/R2

London Luton Airport

Planning Application 12/01400/FUL: Noise

Report 13/1720/R2

Review and analysis of the noise aspects of planning application reference
12/01400/FUL

Luton Borough Council

Town Hall
Luton
LU1 2BQ

Issue	Description	Date	Prepared by	Checked by
1	Issue 1	10 th September 2013	Vernon Cole	Lee Montague
2	Issue 2	24 th September 2013	Vernon Cole	Lee Montague
3	Issue 3	22 nd October 2013	Vernon Cole	Lee Montague
4	Issue 4	25 th October 2013	Vernon Cole	Lee Montague

Prepared by

Checked by

This report and associated surveys have been prepared and undertaken for the private and confidential use of our client only. If any third party whatsoever comes into possession of this report, they rely on it at their own risk and Cole Jarman Limited accepts no duty or responsibility (including in negligence) to any such third party.



Table of Contents

25th October 2013

Executive Summary	1
1 Introduction	4
2 ES Chapter 12: AIRBORNE AIRCRAFT NOISE AND VIBRATION	4
2.1 Policy Context	4
2.2 Airborne Aircraft Noise	5
3 ES Chapter 12: OTHER NOISE SOURCES	9
3.1 Context	9
3.2 Ground Noise	9
3.3 Road Traffic Noise	10
3.4 Construction Noise	13
4 POLICY COMPLIANCE	13
4.1 Aviation Policy Framework	13
4.2 Policy LLA1	16
5 NIGHT FLYING	18
5.1 Night Period	18
5.2 Footprints	19
5.3 Quota Count	20
6 S 106 AGREEMENT and PLANNING CONDITIONS	21
6.1 Quota Count	21
6.2 Prohibition of noisiest aircraft at night	23
6.3 Noise Violation Limits	24
6.4 Noise Insulation Scheme	27
7 CONCLUSIONS	30

Attachments

Glossary of Acoustic Terms



Executive Summary

The application by London Luton Airport Operations Limited (LLAOL) for various improvements to the terminal building, car park and aircraft stands, together with dualling of Airport Way would be expected to increase the passenger carrying capacity of the Airport over a period up to 2028 to 18mppa, requiring 156,840 annual aircraft movements. In context, in 2011 it handled 9.5 mppa, with annual aircraft movements amounting to 99,299. The full passenger carrying capacity without the proposed works is limited to 12.4mppa.

The noise implications in the local community of these proposed developments are contained in the Environmental Statement, Chapter 12. In addition, the Applicant has proposed specific noise control elements in a Heads of Terms for a Proposed Section 106 Agreement together with a Proposed Planning Condition. This report sets out the findings of a review of these documents and other related information. It considers whether the application will result in noise impacts which are consistent with National Government and Local Authority policies, and whether they have been assessed in accordance with established practice and against recognised standards.

So far as airborne aircraft noise is concerned, we have no significant reservations about the methodology employed to quantify the expected noise levels. In numerical terms we believe the contours and footprints presented in the ES reasonably reflect the expected noise impact. However, in interpreting the findings, we believe the following factors need to be considered:

- If the development goes ahead, controlling the noise impact to the levels indicated for 2028 requires that a substantial part of the airline fleet is changed to modern, low noise variants of types currently operating. The primary mechanism put forward for ensuring that this will happen is the Proposed Planning Condition limiting the extent of key daytime and night time aggregate noise contours. While acceptable in principle, some change to the wording of the Condition is recommended in this report.
- Current Government policy on aircraft noise is contained in the Aviation Policy Framework (APF) published in March 2013. The predicted future noise impact with the development in place is greater than that assessed as prevailing at the present time. One consequence of this finding is that the number of people significantly affected by aircraft noise might be neither limited nor reduced if the development goes ahead, and this is an overall objective clearly spelled out in the APF. In response to this, the Proposed Section 106 Agreement contains a commitment that the Airport will seek to continually increase the percentage of flights undertaken by modernised low noise variants of relevant aircraft types. This measure will be adopted by the Airport as part of an effort to continue to reduce the overall noise levels and minimise the impact on the local population.
- Luton Borough Council policy LLA1 states, so far as noise is concerned, that planning permission will be granted for development that results in an aircraft noise impact that is below the 1999 level. The Applicant's noise advisor has interpreted this to mean that the 57dB L_{Aeq,16h} contour predicted for 2028 with the development in place shall be no greater when measured as an overall area than the equivalent contour predicted for 1999. An alternative interpretation



not only limits the measured area but also requires that no location predicted to be affected by the 1999 level shall be exposed to a higher level in 2028 with the development in place. Applying this tighter interpretation would require lower noise levels in 2028 than are predicted for the partial modernisation scenario: achieving the full modernisation scenario, which is stated as best endeavours commitment in the Proposed Section 106 Agreement, noise levels would ensure compliance with the alternative interpretation.

- So far as the potential effects on sleep disturbance of night time operations are concerned, while these have been addressed in the ES, the specific risk of people being awakened by individual aircraft movements are not quantified to the extent that might be expected. Therefore, this report contains an evaluation of the likely incidence of awakenings likely to be caused by the proposed future night time aircraft operations.

So far as noise from aircraft on the ground is concerned, the analysis indicates that some locations may experience future noise levels that would warrant mitigation, but this is not specifically addressed as part of the Noise Insulation Scheme that forms part of the Proposed S 106 Agreement.

Similarly for noise from road traffic associated with the Airport, levels at many of the assessed receptors are high although increases due to the proposed development are modest. It is possible that some properties may warrant protection from this noise, and this could be handled under the terms of the Noise Insulation Scheme that forms part of the S 106 Agreement. Presently, however, this is not included in the proposal.

There are other specific issues relating to the operation of aircraft at night, as this is known to be a particular concern to residents living in the local community. It is proposed to introduce a Quota Count system to limit the amount of noise generated during the period 23h30 to 06h00, in line with the system used at designated London Airports. Specific issues arising are:

- The permitted Quota proposed for Luton Airport is 5,000 aligned to a movement limit of 10,200 during the same period (23h30 to 06h00). An analysis of data available on movements by various aircraft types assessed by the Applicant indicates that both of these values are higher than would be necessary to operate fully in line with the impact indicated in the ES. Based on the information made available, we have estimated that the permitted Quota in 2028 might only need to be just over half of the value being proposed (i.e. 2,800) if the fleet is partially modernised as suggested, and that a movement limit closer to 9,650 would be all that is required.
- No specific controls are proposed for aircraft operating within the night period (23h00 to 07h00) but outside the quota period (23h30 to 06h00). Particularly in the early morning shoulder period of 06h00 to 07h00 the number of movements is expected to increase from 13 in 2011 to 20 in 2028 if the development goes ahead. The effects in terms of potential sleep disturbance during the early morning shoulder period are not detailed in the ES.
- The ban on aircraft with a QC value greater than 2 during the night quota period is considered to be of no value, as no aircraft falling into this category currently operate during the night quota period. In fact only 4% of movements would be affected if the ban was on aircraft with a



QC value greater than 1, and this would be a more meaningful restriction. The Proposed Section 106 Agreement Heads of Terms addresses this issue.

Changes are proposed to the noise violation limits, gently reducing the single daytime and night time limits. However, by applying only single limits that apply to all aircraft operating at the Airport, only the noisiest aircraft will experience any real degree of control. In this report we identify how it would be possible to set different noise violation limits for different classifications of aircraft, thereby ensuring that the noise generated by all aircraft is monitored and tested against a suitable standard. A possible means of achieving this aim, using the already established Quota Count system, is set out in this report.

We have proposed modifications to the Noise Insulation Scheme. The current scheme might be considered the minimum that the Airport would be expected to offer to be consistent with Government strategy. The modifications we propose would benefit those people most affected not just by average levels daytime aircraft noise but also by individual flyovers occurring at night that have the potential to disturb sleep, if these occur on a sufficiently regular basis. We also recommend that the scheme be extended to cover those individuals who are affected by ground noise and noise from road traffic associated with the Airport subject to certain established standards being exceeded.



1 Introduction

1.1 London Luton Airport Operations Limited (LLAOL) has made an application (12/01400/FUL) for development including:

- Improvements to the terminal building and the adjacent public transport hub.
- The dualling of Airport Way between the Holiday Inn roundabout and the Central Terminal Area.
- New car parking facilities including a new multi-storey car park and a pedestrian link to the terminal.
- New aircraft manoeuvring and parking infrastructure including a new taxiway.

1.2 The development, if implemented, would be expected to increase the passenger handling capacity of the Airport to around 18 mppa (million passengers per annum). These passengers would be handled by a predicted 156,840 aircraft movements per annum. In 2011, the last year for which full data are available, it handled 9.5 mppa, with annual aircraft movements amounting to 99,299.

1.3 The predicted increase in passenger throughput and aircraft movements would be expected to occur over the period ending 2028 and would also be expected to lead to changes in the noise levels experienced within the communities around the Airport. Those changes have been predicted and quantified in the accompanying Environmental Statement, specifically Chapter 12 and the associated Appendices dealing with Noise and Vibration. Proposals for controlling and mitigating the predicted noise impacts are set out in the Proposed Section 106 Heads of Terms forwarded to Luton Borough Council on 18th October 2013.

1.4 This report sets out the findings of a review, undertaken on behalf of Luton Borough Council, of the noise aspects of the proposed development.

2 ES Chapter 12: AIRBORNE AIRCRAFT NOISE AND VIBRATION

2.1 Policy Context

2.1.1 The Environmental Statement was submitted in November 2012. It refers to the 2003 White paper entitled The Future of Air Transport (referred to as the ATWP) as setting out the Government's current policy in relation to aviation and aviation noise. Reference is made to the (then) draft Aviation Policy Framework (APF) which would be expected to replace parts of the ATWP.

2.1.2 The Government formally published the Aviation Policy Framework in March 2013, defining what it believes is a balanced approach to securing the benefits of aviation. Its stated objective



is that aviation needs to grow while respecting the environment and the quality of life of people affected by aviation activity.

- 2.1.3 The current application therefore needs to be assessed against the current policy as set out in the Aviation Policy Framework. Section 4.1 of this report considers the implications with regard to noise.

2.2 Airborne Aircraft Noise

Assessment Criteria: Absolute Levels

- 2.2.1 We accept the basic premise that as part of any impact assessment, noise from aircraft shall be assessed against $L_{Aeq,16h}$ daytime values that are suggested by research to reflect the response of the local community to noise. A level of 57dB $L_{Aeq,16h}$ is considered to mark the onset of significant community annoyance and represents 'low' community annoyance; 63dB $L_{Aeq,16h}$ represents 'moderate' community annoyance; and 69dB $L_{Aeq,16h}$ represents 'high' community annoyance.
- 2.2.2 So far as night time noise is concerned, studies at a number of airports have conventionally plotted $L_{Aeq,8h}$ night time contours in 3dB increments starting at 48dB $L_{Aeq,8h}$, and this is the value defined as the NEC A/B threshold for night time aircraft noise as defined in PPG24: Planning and Noise. Although this guidance is now revoked (by the NPPF), there is currently no alternative guidance available which sets quantitative values for assessing average levels of airborne aircraft noise at night.
- 2.2.3 With regard to average levels of night time noise, Appendix N(2) of the ES points out that compliance with European Directive 2002/49/EC requires member states to produce noise maps and noise action plans for major conurbations, and in contributing to this process, operators of major airports are expected to produce strategic noise maps and draft noise action plans. So far as night noise is concerned, contours shall be produced for L_{night} which is effectively equivalent to the $L_{Aeq,8h}$ index referred to above with the difference that the L_{night} index considers movements averaged over an entire year rather than the 92 day summer period for which the $L_{Aeq,8h}$ index applies. It would be normal to plot the L_{night} contour down to a threshold of 50dB and use the sleep disturbance relationships set out in Appendix N(2) Table N(2)-4.
- 2.2.4 The ES is correct in its assertion that night time noise is also assessed by reference to single event noise levels associated with individual flyovers as aircraft depart from or arrive at an airport at night, as it is the loudness of single events that can be correlated with sleep disturbance. The currently adopted guidance is set out in a UK Department of Transport study dating back to 1992, entitled 'Report of a Field Study of Aircraft Noise and Sleep Disturbance'. The study found that there is no significant risk of sleep disturbance for locations outside the 90dBA SEL footprint, while people exposed to single event levels between this value and 100dBA SEL suffer a slight risk of sleep disturbance (a 1 in 75 chance of an awakening).



- 2.2.5 Therefore, in a historical sense, Chapter 12 of the ES relies on appropriate criteria for assessing the effects of aircraft noise, and Appendix N(2) presents a comprehensive description of the criteria and how they have been derived.
- 2.2.6 We have a reservation, as set out in Section 4.1 of this report, regarding how the Aviation Policy Framework should properly be interpreted. The document identifies that there is recognition that the full effects of aircraft noise on a community do not solely correlate with averaged noise levels. As a result, the policy appears to encourage airport operators to develop measures that better reflect how aircraft noise affects local communities and to consult those communities on the issue. On that basis, the historically accepted L_{Aeq} measure of daytime noise effects may not be necessarily sufficient, although the current application makes no comment on this.

Assessment Criteria: Relative Levels

- 2.2.7 A key comparison is the predicted daytime 57dB $L_{Aeq,16h}$ contour for the year of full capacity operations (2028) against the 1999 predicted 57dB $L_{Aeq,16h}$ contour. Luton Borough Council policy LLA1 confirms that, so far as noise is concerned, planning permission will be granted for development that results in an aircraft noise impact that is below the 1999 level. If the noise levels predicted for operations at the full future capacity can be shown to meet this comparative test, the Applicant's noise case is strong. Section 3.2 of this report sets out various issues relating to this important test that need to be taken properly into account in carrying out the assessment. Again, there is a question of interpretation of the precise meaning of the policy that needs to be considered before stating that compliance is achieved.
- 2.2.8 The normal test of the degree to which a proposed development is expected to affect future noise levels is to consider the noise impact arising at the future date of full capacity operations, in this case 2028, with and without the development in place. The ES does this, and quite fairly considers the beneficial noise effects of fleet modernisation for both the 'with development' and 'without development' scenarios. The findings are summarised in ES Chapter 12 Tables 12.13 and 12.14.

Assessment Methodology

- 2.2.9 ES Chapter 12 Appendix N(3) sets out in detail the methodology employed for generating the predicted airborne aircraft noise contours. In general, we have no objection to any of the statements made or methods employed and consider the approach to be robust and consistent with current best practice.
- 2.2.10 It is worth noting, however, that to be able to endorse the accuracy and appropriateness of the contours and footprints set out in the ES, it would necessary to have the precise input data used for the INM contouring. Although Appendix N(3) provides a lot of supporting information that enables a general understanding of the operations that underpin the model, key choices such the number of operations of different aircraft types modelled to take place during the various time periods cannot be reviewed.



2.2.11 ES Chapter 12 Appendix N(3) contains airborne aircraft noise contours for two modes of operation, commonly referred to as aggregate mode and single mode. For clarity:

- *Aggregate mode* considers the movements of aircraft as they take place over the various departure and arrival routes throughout a typical summer season. For example, the contours take account of the fact that the vast majority of operations on a runway are in a westerly direction, and the noise contours reflect this; it can be seen that they cover a greater area on the western side of the Airport than on the eastern side. Aggregate mode noise contours are used to assess noise effects against the standards derived from the various historic studies of community response; it is the aggregate mode of operations which is used to derive the 57dB $L_{Aeq,16h}$ contour referred to in the APF.
- *Single mode* considers the movements of aircraft on a given day when they are operating in either a westerly or an easterly direction. The shapes of the contours are quite different, reflecting that on any given day people might be exposed to noise from landing or departing aircraft only, the latter giving rise to noise effects over a much wider swath of the community. These contours are normally produced at the same average noise levels as are used for the aggregate mode contours. However, caution needs to be applied in interpreting them as strictly speaking the criteria used to assess levels of community annoyance are only valid for aggregate mode contours. Nevertheless, the inclusion of these contours is a welcome addition to the ES information and can serve to assist in developing a clear qualitative understanding of the noise effects of existing and proposed operations.

Fleet Modernisation

- 2.2.12 It is also worth making comment about the notion of fleet modernisation, as some weight is given to this in ES Chapter 12 as a means of ensuring that future noise levels at full capacity with the development in place are not significantly higher than at the present time. Importantly the concept of fleet modernisation is used in the ES to suggest that the current proposals are generally consistent with the provisions of policy LLA1.
- 2.2.13 Although not clearly stated in the ES, we have been advised that the noise contours produced for the 'fleet modernisation' case rely on 50% of the following aircraft being replaced with newer, low noise engine variants: B737-800, A319, A320 and A321. This equates to approximately 35% of the total aircraft fleet currently operating.
- 2.2.14 The Applicant's noise expert claims that this is a relatively cautious approach, as work undertaken by noise consultants for Heathrow Airport in their submission to the Airports Commission assumed that 90% of these aircrafts types would be replaced with low noise versions by the year 2030. In addition, reference is made to orders placed, or contemplated, by the low cost carriers Easyjet and Ryanair for new, low noise versions of the Airbus A320 family (the NEO) and Boeing 737 family (the MAX) as part of their strategy for maintaining new, efficient aircraft in their fleet.
- 2.2.15 Encouraging as these statement are, the importance of fleet modernisation to the current application should not be minimised. Therefore, consideration needs to be given to how the



future use of quieter aircraft can be conditioned or otherwise assured as part of granting consent for the current application.

- 2.2.16 It should also be noted that if the LLAOL took a more bullish approach to the issue of fleet modernisation, and worked to ensure that by 2028 a greater percentage of the relevant aircraft are replaced with low noise variants (say along the lines assumed for Heathrow), then the predicted daytime and night time noise impact would be lower than currently stated in the ES.

Predicted Effects

- 2.2.17 In summary, the predicted noise effects can be stated as:

- Airborne aircraft generate a significant noise impact in the community around the Airport. The impact is significant now and is expected to remain significant whether or not the proposed development proceeds.
- In the year of full capacity operations, 2028, the community noise impact is expected to be higher than currently experienced (2011) with the majority of locations experiencing increases in daytime and night time noise levels.
- If the proposed development is permitted, facilitating up to 18mppa capacity, the general increase in noise levels is expected to be greater than if no development takes place, in which case the capacity is restricted to 12.4mppa.
- The increase in noise levels in each case can be limited, but not eliminated, if fleet modernisation assumptions are made. The current assumption requires that 50% of the most frequently operating aircraft, the Boeing 737 and Airbus A320 are replaced by new variants that are designed to be quieter than those currently operating.
- Luton Borough Council policy LLA1 states, so far as noise is concerned, that planning permission will be granted for development that results in an aircraft noise impact that is below the 1999 level. The current application only meets this test if a particular interpretation of the policy is applied. We address the policy and its interpretation in Section 4.2.
- The applicant's noise specialist takes the view that the predicted noise impact set out in the ES is in line with current Government policy contained in the Aviation Policy Framework published in March 2013. However, as set out in Section 4.1, the predicted future noise impact is greater than that assessed as prevailing at the present time with the consequence that the number of people significantly affected by aircraft noise will be neither limited nor reduced. It is therefore a question of how the APF should be interpreted in defining whether its provisions are fully met.

- 2.2.18 On the issue of night time noise effects, it is felt that the ES Chapter 12 does not go far enough in quantifying the likely impact. In Appendix N(2) it is noted that the picture for assessing night noise using L_{Aeq} period contours is not clear and that a full assessment of night noise will require consideration of the noise of individual aircraft, for example in terms of SEL, alongside the period L_{Aeq} contours.



- 2.2.19 In spite of this recognition, the ES limits its assessment of these effects to a comparison of the extent and coverage of the $L_{Aeq,8h}$ night time contours for the various years of operation. A number of noise footprints have been produced at 80dBA and 90dBA SEL values for a number of different aircraft both departing and arriving, as contained in Appendix N(4). However, no analysis of the likely effects of these footprints is undertaken.
- 2.2.20 It is useful to estimate the population within these footprints, particularly the 90dBA SEL footprint, as it should then be feasible to predict the number of awakenings expected per night due to the proposed operations (based on the 1 in 75 chance of such an awakening occurring), and where these are most likely. Not only does this assist in quantifying the noise at night using a method that does not rely only on the value of the average noise levels (as recommended in the APF), but it also helps to identify those locations most at risk of night time noise disturbance.
- 2.2.21 By comparing the present day incidence of sleep disturbance to that expected in the future, the benefits or disbenefits of the proposed development can be better quantified and means of controlling or mitigating the effects can be explored. The ES, in Appendix N(4), wants to rely purely on the fact that fleet modernisation will occur with the consequence that some the most commonly operating night time aircraft will be quieter. It is for this reason that the future limits on noise that rely on fleet modernisation are addressed in the Proposed Planning Condition and the Proposed Section 106 Agreement Heads of terms.
- 2.2.22 Further discussion of night flight noise footprints and how they can be used to better assess the noise impact and the required mitigation is set out in Section 3.1.

3 ES Chapter 12: OTHER NOISE SOURCES

3.1 Context

- 3.1.1 The noise generated by other sources associated with the operation of the Airport is pertinent to an assessment of the merits of the application as a whole, and that is why they are addressed in the ES. However, such issues are not considered to be central to the decision on whether the application should be granted or not, providing that the noise effects from these sources is able to be controlled or mitigated by suitable conditions or suitable drafting of the Section 106 Agreement.

3.2 Ground Noise

Assessment Criteria

- 3.2.1 The criteria proposed for the assessment of ground noise are considered appropriate for this analysis. The 55dB $L_{Aeq,15h}$ daytime and 45dB $L_{Aeq,8h}$ night time values have been used at numerous airports to identify the onset of community annoyance to ground noise.



Complaints

- 3.2.2 The incidence of complaints arising from noise generated by ground based activities is low. In general terms, this is indicative that ground noise is not an issue of major concern to local residents. However, that is not to say that there are no complaints at all about ground noise, and a small number of individuals have been disturbed sufficiently to register complaints.
- 3.2.3 Where the complaints originate location-wise cannot be determined from the complaints analysis, but it would be worth establishing the precise factors involved in case there are specific, local measures that can be adopted at the Airport in order to ameliorate the effects.

Analysis

- 3.2.4 The analysis of ground noise generation and propagation has been undertaken using data measured for various activities by various types of aircraft moving on the ground. We have seen this approach used several times previously by the Applicant's noise advisor and have no fundamental objections to its use in an ES.

Impact

- 3.2.5 The results of the ground noise analysis for the worst affected receptors are summarised in ES Chapter 12 Tables 12.9 for the baseline (2011) situation and 12.16 for the full capacity operations with the development in place (2028). In both cases it is indicated that the night time noise threshold for the onset of community annoyance is exceeded, but it is concluded that no impact is considered to arise due to the slight noise level increases predicted, stated as being only 1dB.
- 3.2.6 However, examination of the figures in the tables would suggest that noise at night due to APU use could increase by up to 3dB at receptor 3 and 5dB at receptor 4. Furthermore, in each case, the night time threshold of 45dB $L_{Aeq,8h}$ is clearly exceeded, yet no proposals for mitigation or control are made.
- 3.2.7 There may be local solutions such purpose built screening that could be implemented to reduce ground noise propagation. If consultation with the Airport reveals that such solutions may not easily be implemented, then the issue of ground noise could be addressed through the noise insulation scheme as set out Section 6.3 of this report.

3.3 Road Traffic Noise

Assessment Criteria

- 3.3.1 ES Chapter 12 Table 12.5 identifies 66dB $L_{Aeq,16h}$ as being the façade incident noise level that would indicate a substantial noise impact. The preceding text demonstrates how this value is comparable to the 63dB $L_{Aeq,16h}$ standard used to determine moderate community annoyance with regard to air noise. This is a free field noise level which is also the threshold at which properties would be eligible for sound proofing under the existing Noise Insulation Scheme.



- 3.3.2 We have been advised by the Applicant's noise specialist that the values that have been assessed and set out in the ES (Tables 12.10 and 12.17) are not actually façade corrected levels, but free field levels at 10m from nearside kerbs. Therefore the values set out in the tables cannot simply be compared to the assessment thresholds in Table 12.5. The figures presented in the tables would need to be increased by 3dB to account for the façade reflection effect and adjusted for actual distance of a building façade from the traffic noise source.

Relative Noise Levels

- 3.3.3 The traffic noise assessment considers the likely increase in noise arising from increases in traffic flow predicted on local roads if the development goes ahead and the Airport operates at full capacity. The data for the predicted increases in traffic on various road segments is set out in ES Chapter 13, Traffic and transport.
- 3.3.4 Those road segments indicated as having relatively large increases in traffic flow as result of the development are already carrying relatively high volumes of traffic and properties adjacent to them are already exposed to relatively high traffic noise levels.
- 3.3.5 Those road segments indicated as having the largest increases in traffic flow as result of the development (Airport Way Spur and A505 Kimpton Road) are very close to the Airport and there are no residential receptors alongside them.
- 3.3.6 It is principally for these reasons that noise level increases between the present day baseline and the year of full capacity operations is not more than 3dB at any location, and the year of full capacity operations with the development is predicted to be no more than 2dB louder at any location than without the development.

Absolute Noise Levels

- 3.3.7 However, if one considers the absolute noise levels experienced by the tabulated receptors, many of them are already exposed to traffic noise levels in excess of the 63dB $L_{Aeq,16h}$ free field noise criterion, assuming the 10m from nearside kerb assessment position fairly represents the location of windows in houses fronting onto the roads in question. There are already a large number of residential properties exposed to road traffic noise levels that would entitle them to mitigation under the Noise Insulation Scheme, if that scheme were extended to cover dwellings affected by noise from road traffic associated with the Airport.
- 3.3.8 In this context, and since the existing noise levels are already at or above the threshold at which sound insulation is deemed appropriate to protect the internal environment, the expected increase in noise levels could be more significant in terms of its impact.
- 3.3.9 The Noise Insulation Regulations stipulate that residences affected by noise from new or altered highways shall be eligible for noise insulation works if the noise levels after the works exceed 68dB $L_{A10,18h}$ and are caused to increase by not less than 1dB as a result of the works. ES Chapter 12 establishes that 68dB $L_{A10,18h}$ is equivalent to 66dB $L_{Aeq,16h}$ and that at most assessed road segments the works associated with his application are expected to increase road



traffic noise levels by not less than 1dB and lead to full capacity year noise levels in excess of 66dB $L_{Aeq,16h}$.

- 3.3.10 On this basis, there would be good cause to extend the proposed new Noise Insulation Scheme to cover residential properties affected by road traffic noise if the relevant road traffic noise criteria are met and the property is not otherwise covered by virtue of its exposure to airborne aircraft noise. This issue is covered in Section 6.3 of this report.

Extent of Assessment

- 3.3.11 Segments of road which have benefitted from a traffic noise assessment are limited to those closest to the Airport. The road segments referred to in ES Chapter 12 Tables 12.10 and 12.17 are fewer in number and extent than the segments of road assessed for traffic changes in ES Chapter 13 Table 13.7. The Applicant's noise specialist has indicated the rationale for this is that analysis of those roads closest to the Airport, and carrying the highest amount of Airport traffic, has indicated only minor increases in noise levels. Accordingly, more distant roads carrying less Airport traffic would not be expected to experience any greater increases in noise levels.
- 3.3.12 However, the relatively high absolute values being predicted for both baseline and the developed scenarios suggest that more distant segments of road might still be exposed to relatively high levels of noise from traffic associated with the Airport.
- 3.3.13 Under normal circumstances, therefore, we would expect the road traffic noise assessment to mirror the extent of traffic flow rate assessment. As a consequence, further information was requested from the Applicant's noise advisor so that changes in expected traffic noise levels could be quantified on all segments of road covered in ES Chapter 13 Table 13.7. The following additional information, annotated as a supplement to Table 21 of Technical Appendix H to the Chapter 12 of the ES, has been submitted:

Supplement to Table 1: Typical Future (2028) Daytime Road Traffic Noise Levels near Local Roads (Predicted at 10m from nearside kerb)

Road Segment	Daytime Road Traffic Noise dB $L_{Aeq,16h}$		
	2028 No Airport Development	2028 With Airport Development (difference)	Increase from 2011 – 2028 Without Development
Wigmore Lane	67	68 (+0.4)	(+1.0)
Ashcroft Road	68	68 (+0.0)	(+0.9)
A505 Vauxhall Way (between Crawley Green Road and Hitchin Road)	72	72 (+0.4)	(+1.1)
A5228 Hitchin Road	73	73 (+0.1)	(+0.9)
A505 Stopsley Way	74	74 (+0.1)	(+1.1)



Note: Noise levels have been rounded to the nearest integer.

- 3.3.14 It can be seen for these additional segments of road that the traffic noise analysis indicates relatively modest expected increases in noise levels due to the proposed development. However, when taken together with the already very high noise levels likely to exist at the facades of exposed residences these increases are at some locations higher than 1dB and therefore sufficient to warrant enhanced noise insulation if the terms we have outlined in Section 6.3 are adopted in the Noise Insulation Scheme.

3.4 Construction Noise

- 3.4.1 The construction noise assessment has not been undertaken to any great degree of detail. The assumption is that during construction no point on any part of the site that is further than 10m from any plant, either stationary or moving, will register noise levels in excess of 80dBA. It is not normal for construction methods and programs to be highly developed at this stage in an application process, and the approximate nature of the noise analysis reported in ES Chapter 12 is therefore understood and accepted.
- 3.4.2 It is recommended that should permission for the application be considered, it is conditional on the applicant undertaking a full and proper assessment of the likely noise and vibration impacts arising from construction once the methodology is defined to a suitable level of detail. These should be passed onto Luton Borough Council for assessment, and if deemed appropriate a Section 61 Agreement could be entered into.
- 3.4.3 Section 61 of the Control of Pollution Act 1974 affords the party who will be generating construction noise, in this case the main Contractor, the opportunity of applying to Luton Borough Council for prior consent to carry out the works. The application would normally result in an agreement between the two parties, termed a section 61 Agreement, which sets out particulars of the works and how they will be carried out and the steps that will be taken to minimise noise.
- 3.4.4 The Agreement, once in place, then informs the precise way in which the Contractor will carry out the works including any restrictions on hours, use of machinery or equipment and, sometimes but not always, specific noise limits that will not be breached. Once a Section 61 Agreement is in place, the Local Authority cannot then serve a Section 60 notice providing the Contractors complies with the provisions of the agreement. It also offers a defence against action under Statutory Nuisance by the local authority under the terms of the Environmental Protection Act

4 POLICY COMPLIANCE

4.1 Aviation Policy Framework

- 4.1.1 With regard to noise, the Aviation Policy Framework published in March 2013 states (Executive Summary, paragraph 17):



Our overall objective on noise is to limit and where possible reduce the number of people in the UK significantly affected by aircraft noise.

4.1.2 Paragraph 3.11 of the ATWP states that is the Government's basic aim to limit and where possible reduce the number of people in the UK significantly affected by aircraft noise. These two statements taken together, contained in separate versions of an evolving Government policy toward aircraft noise, give significant weight to the principle of limiting and, where possible, reducing the number of people significantly affected by aircraft noise.

4.1.3 The same paragraph goes on to say:

To achieve this, we want to incentivise noise reduction and mitigation, and we also want to encourage better engagement between airports and local communities and greater transparency to facilitate informed debates.

4.1.4 Section 3 of the document deals with noise and other local environmental impacts, and proposes to continue to ensure that noise exposure maps are produced at the noise-designated airports (Heathrow, Gatwick and Stansted) down to a level of 57dB $L_{Aeq,16h}$. The Government will continue to treat the 57dB $L_{Aeq,16h}$ contour as the average level of daytime aircraft noise marking the onset of significant community annoyance.

4.1.5 In paragraph 3.19, it is recognised that people do not experience noise in an averaged manner and the value of the L_{Aeq} indicator does not necessarily reflect all aspects of perception of aircraft noise. For this reason it is recommended that average noise contours should not be the only indicator of noise effects at locations under and around flight paths. Instead, airport operators are encouraged to develop measures in consultation with their consultative committees and local communities that better reflect how aircraft noise is experienced in different localities.

4.1.6 On balance, therefore, we do not have any basic objection in policy terms to the production of L_{Aeq} noise contours and using the 57dB $L_{Aeq,16h}$ value as indicating the onset of significant community annoyance. However, the way in which the Environmental Statement responds to the Aviation Policy Framework should be judged in respect of two key issues:

1. How will the Airport implement controls and impose limits on the types and numbers of aircraft operations so as to seek to ensure that the 57dB $L_{Aeq,16h}$ noise contour is no more extensive than that applying at the present time?

Reason: The APF makes it clear that the Government considers 57dB $L_{Aeq,16h}$ to mark the onset of significant community annoyance and it also defines the clear objective of limiting and possibly reducing the number of people in the UK significantly affected by aircraft noise. On that basis it would be appropriate to consider the present day exposure to significant annoyance as being the benchmark against which future noise exposure should be assessed, limited and possibly reduced.



2. Should the ES noise study not have included an examination of other means of quantifying the effects of aircraft noise to better respond to the concerns and response of locally affected members of the community?

Reason: Airport operators are encouraged to develop measures in consultation with their consultative committees and local communities that better reflect how aircraft noise is experienced in different localities. While $L_{Aeq,16h}$ daytime and $L_{Aeq,8h}$ night time contours might be an appropriate starting point in assessing the community effects of aircraft noise, some attempt should be made to consider other metrics and noise descriptors that respond to commonly expressed community concerns. One might consider, for example, some dialogue between the Airport's specialists and Luton Borough Council and other interest groups on means of responding to the relatively higher annoyance caused by high numbers of lower noise flyovers as compared to that caused by small numbers of higher noise flyovers, even though the average noise levels (L_{Aeq}) might be comparable.

- 4.1.7 On point 1, the Applicant's noise specialist interprets the provisions of the APF as having a different meaning in the case where an airport is applying for development that will increase its passenger carrying capacity. Referring to the 2003 Air Transport White Paper (ATWP), it is suggested that the developments it proposed were expected to lead to increases in community noise levels, thereby underlining the proposition that the policy cannot be read to indicate no increases.
- 4.1.8 The Applicant's noise specialist's proposition for this application, therefore, is not that there shall be no noise increase beyond what is currently experienced, but that any increase is limited and reduced in extent as far as possible. On that basis, it is fair to ask whether the provisions that are being proposed in this application to reduce the extent of the increase have been taken as far as possible.
- 4.1.9 Taking as an example the matter of fleet modernisation, the noise analysis set out in the ES is based on only half of the relevant aircraft being expected to be replaced with low noise variants by 2028. A reasonable response to the APF is that efforts should be made to ensure that as many as possible, and preferably 100%, benefit from the same replacement.
- 4.1.10 The Applicant's advisors have set out a Proposed Planning Condition that would strictly limit the noise generated by aircraft operations in the future to a daytime and a night time envelope consistent with 50% fleet modernisation. The proposed wording is:
- The development hereby permitted shall not generate noise such that the area of the noise contours would by 2028 for daytime noise 19.5 km² for the area exposed to 57dB $L_{Aeq, 16hr}$ and above and for night-time noise to 40.4 km² for the area exposed to 48dB $L_{Aeq, 8hr}$ and above.*
- 4.1.11 We recommend a slight modification to wording that ensures there is no prospect of these contours areas being exceeded at any time between now and 2028, namely:

*The development hereby permitted shall not generate noise such that the area of the noise contours **at any time between now and 2028 and beyond exceed** for daytime noise 19.5 km²*



for the area exposed to 57dB $L_{Aeq, 16hr}$ and above and for night-time noise 40.4 km² for the area exposed to 48dB $L_{Aeq, 8hr}$ and above.

- 4.1.12 Taking the issue of fleet modernisation further in an attempt to minimise the expected noise impact in line with the APF, the Proposed S106 Agreement Heads of Terms responds to this issue by stating in Paragraph 1.5:

LLAOL will seek continuing improvements in respect of fleet modernisation and will use reasonable endeavours to reduce the area of the noise contours by 2028 for daytime noise to 15.2km² for the area exposed to 57dB $L_{Aeq, 16hr}$ and above and for night-time noise to 31.6 km² for the area exposed to 48dB $L_{Aeq, 8hr}$ and above. Within five years of the commencement of development it will submit its strategy to meet this objective.

- 4.1.13 On point 2 the Applicant's noise specialist relies on the fact that the $L_{Aeq, 16h}$ daytime and $L_{Aeq, 8h}$ night time contours are the only means necessary of quantifying the likely noise impact due to their historic use and the fact that it took many years for the methodology to be put in place. Although other information is provided, including movement numbers, hourly frequency and single mode contours none of these are used to quantify the likely noise impact.
- 4.1.14 It is suggested that the Airport has always been open to constructive suggestions, but whether it has taken active steps to engage the local population and discuss the manner in which people are affected by the noise it produces is not articulated.

4.2 Policy LLA1

- 4.2.1 In respect of aircraft noise, Policy LLA1 states:

Policy LLA1 Development at London Luton Airport

The Borough Council will grant planning permission for development at London Luton Airport (identified as such on the Proposals Map) provided it:

(iv) results in an aircraft noise impact that is below the 1999 level;

- 4.2.2 In terms of interpreting how policy LLA1 should be applied, it is worth repeating the wording of Condition 11 which formed part of the grant of permission to the 1997 Application 98/01096/FUL:

Before any part of the development hereby permitted is commenced an annual noise control scheme shall be submitted to and approved by the Local Planning Authority and the Airport Consultative Committee which sets out proposals relating annual aircraft noise from the Airport's Operation to the Forecast ATM and Contours 1999 (16 hours and 8 hours with development), submitted in the London Luton Airport Environmental Statement dated 8th September 1997 prepared by Stanger Science and Environment on behalf of London Luton Airport Ltd., and which ensure that in any event, this does not exceed the impact as measured in terms of land area affected for 1984. The submitted proposals shall include, but shall be confined to, the following:- (i) Annually submitted daily movement register information, (ii) Leq noise contours



for the preceding and current calendar year and forthcoming calendar year for both the daytime (0600 - 2200 hours GMT) and night-time (2200 - 0600 hours GMT) periods, (iii) Arrangements for the verification of the submitted information.

- 4.2.3 To date, Luton Borough Council and the Airport have worked on the basis that the 1999 level is defined by the noise contours predicted in a 1997 ES and not the 1999 levels measured for that year of operations.
- 4.2.4 The results of the noise modelling are offered for comparison with policy LLA1 on the basis of area covered. That is to say, if the respective areas of the 57dB $L_{Aeq,16h}$ daytime contour and 48dB $L_{Aeq,8h}$ night time contour are smaller than those computed for 1999, then the provisions of the policy are met.
- 4.2.5 However, we believe that this is a not the only possible interpretation of the policy requirements and it is important to consider both the total area and the locations on the ground affected by noise at 57dB $L_{Aeq,16h}$ before determining whether compliance with the policy is indeed likely.
- 4.2.6 Comparing the area within the 57dB $L_{Aeq,16h}$ contour predicted for the future year of highest operations (2028 with development) to that predicted for 1999 operations could be considered as only one test of whether the restriction set out in LLA1 is met. An alternative reasonable interpretation of the control implied by the planning policy is that no location should be exposed to future noise levels that are higher than those existing (or at least predicted to exist in 1999).
- 4.2.7 This means that the shape of each contour must be considered alongside their respective areas, and compliance with policy LLA1 would not occur if there are any locations expected to be within the 2028 with development 57dB $L_{Aeq,16h}$ contour which is not also within the 1999 contour, even if the total area of coverage is no greater.
- 4.2.8 Table 12.13 of the ES Chapter 12 compares the total areas within both the 57dB $L_{Aeq,16h}$ daytime and 48dB $L_{Aeq,8h}$ night time contours in 2028 for various development scenarios against the 1999 predicted contours. On first inspection it would appear to demonstrate that the provisions of policy LLA1 are met providing the full capacity operations in 2028 with the development in place incorporate fleet modernisation. However, the more detailed analysis set out in Table 12.14, undertaken for various locations around the Airport, indicates that while some areas are expected to benefit from lower future noise levels than were predicted for 1999, other areas will experience higher levels. These include, Grove Farm, Park Town and Slip End.
- 4.2.9 However, as noted above there is a commitment contained in Paragraph 1.5 of the Proposed S106 Agreement Heads of Terms that the Airport will seek to continually increase the percentage of flights undertaken by modernised low noise variants of relevant aircraft types. If 100% fleet modernisation can be achieved, then Policy LLA1 could be stated as being achieved both in respect of the area covered the relevant noise contours and the fact that no location will experience an increase in noise levels in the future.



5 NIGHT FLYING

5.1 Night Period

5.1.1 There are currently three night periods defined in considering noise effects arising from operations at Luton Airport, and referred to in the ES:

- $L_{Aeq,8h}$ period 23h00 to 07h00: used for assessing night time noise effects in a planning context.
- 23h00 to 05h59: the Night Policy period adopted for weekdays and Saturdays by Luton Airport Ltd, (23h00 to 06h59 on Sundays).
- 23h30 to 06h00: the Night Quota period as defined by central Government for the designated airports.

5.1.2 It is not clear from the terms of the Airport's Night Noise Policy (Issue 8) why certain restrictions and commitments are limited to the shorter night period finishing at 05h59 (weekdays and Saturdays) rather than the night period ending 07h00 as defined in government planning policy guidance, the Noise Restrictions Notice set out in the Supplement to the UK AIP SUP:006/2011 published on 24 March 2011 and as adopted by the World Health Organisation. Adoption of the shorter period for policy reasons effectively means that the period from 06h00 to 07h00, when the majority of people might be expecting to enjoy relatively undisturbed sleep, is devoid of controls that might reasonably be expected to be put in place to protect that sleep.

5.1.3 In 2011, on average there were around 38 aircraft movements during the 8 hour night period (23h00 to 07h00) and around 25 movements during the night policy period (23h00 to 05h59), meaning 13 movements were expected in the single hour from 06h00 to 07h00. For the year 2028 with the development in place and the Airport operating at full capacity, there are expected to be around 50 aircraft movements during the 8 hour night period (23h00 to 07h00) and around 30 movements during the night policy period (23h00 to 05h59), meaning 20 movements are expected in the single hour from 06h00 to 07h00. It can be seen, therefore, that the single hour of the night period not covered in the Night Noise Policy is expected to experience a disproportionate effect in terms of increased aircraft activity and potentially increased aircraft noise.

5.1.4 By reference to the Night Quota period defined for the designated airports, 23h00 to 23h30 and 06h00 to 07h00 are sometimes referred to the 'shoulder periods' and consideration is given to the effects of operations at these times separately to the aggregate daytime or night time noise levels.

5.1.5 In any event, and irrespective of the various definitions that might be applied to different periods of the night, it is important that the relatively large number of aircraft movements experienced and expected between the hours of 06h00 and 07h00 on any typical day are given due consideration in noise terms. Controls and mitigation measures adopted by the Airport must be framed to properly reflect the likelihood of sleep disturbance.



5.2 Footprints

- 5.2.1 ES Chapter 12 Appendix N(4) gives details of the areas covered by the noise footprint on take-off or landing for those aircraft that operate most commonly at night. While this is useful, if not essential information, the analysis of the effects of those footprints does not go far enough.
- 5.2.2 As noted in paragraph 2.2.3 above, the 'Report of a Field Study of Aircraft Noise and Sleep Disturbance' found people exposed to single event levels above 90dBA SEL suffer a slight risk of sleep disturbance (a 1 in 75 chance of an awakening). It is therefore possible to examine the effects of people living within the footprints in terms of identifying the likelihood of the operations in question giving rise to sleep disturbance.
- 5.2.3 Take for example, the Airbus A320 departing in a westerly direction. Table N(4)-1 indicates that the population within the 90dBA SEL footprint is 1,091. Based on the 1 in 75 chance of an awakening being caused by noise at or above this level, every time the A320 takes off in this direction at night, there is the risk of 14.5 incidences of sleep disturbance. Furthermore, Table 6.14 of the 2011 Annual Monitoring report indicates that there were 3,251 movements at night (23h00 to 07h00) by the A320. Analysis of the data contained in Table N(3)-2 of ES Chapter 12 Appendix N(3) indicates that about 47% of these movements are departures and Table N(3)-4 indicates that 70% of these are in a westerly direction, giving a total of 1,070 night departure of the A320 in a westerly direction.
- 5.2.4 On an annual basis, therefore, there is the risk of slightly more than 15,500 incidences of sleep disturbance due solely to the operation of this aircraft on take-off in a westerly direction.
- 5.2.5 If the effects of this aircraft type departing and arriving in all directions are taken into account, the analysis indicates that the risk of incidence of sleep disturbance rises to over 21,000 per year.
- 5.2.6 It is not possible to quantify the effects of all the aircraft known to operate at night as 90dBA SEL footprints are not provided for all of them. However, it is known there were 1,696 night time movements by the Boeing 737-800 and 2,728 night time movements by the Airbus A300, both of which generate comparable noise levels. Adding the effects of these aircraft alone may increase the risk of incidence of sleep disturbance to around 50,000 per year.
- 5.2.7 In context, CAP 725 CAA Guidance on the Application of the Airspace Change Process identifies in Appendix B Annex 4 that there are natural awakenings occurring in the general population at a rate of around 18 per night that occur in the absence of any external noise effects. On this basis the incidence of awakenings attributable to aircraft noise events is very low in comparison to those that would be expected to occur as matter of course.
- 5.2.8 However, for consistency with the position posited by the Applicant's noise specialist that any noise increase beyond that experienced now should be limited and reduced in extent as far as possible, then additional awakenings due to night time aircraft noise should be avoided or, as a minimum, mitigated.



5.3 Quota Count

- 5.3.1 The designated London Airports (Heathrow, Gatwick and Stansted) are required to operate in accordance with the Noise Restrictions Notice set out in the Supplement to the UK AIP SUP:006/2011 published on 24 March 2011. During the period 23h30 to 06h00, known as the night quota period, the Quota Count (QC) of any aircraft on take-off or landing shall be calculated on the basis of the noise classification for that aircraft on take-off or landing, as appropriate, as follows:

Noise Classification (EPNdB)	Quota Count Points (QC)
<83.9	0 (exempt)
84-86.9	0.25
87-89.9	0.5
90-92.9	1
93-95.9	2
96-98.9	4
99-101.9	8
>101.9	16

T1 Allocation of Quota Count points based on aircraft noise emission

- 5.3.2 The following aircraft shall be exempt:

- those jet aircraft with a Maximum Certificated Weight not exceeding 11,600 kilograms.
- those propeller aircraft which, on the basis of their noise data, are classified at less than 83.9 EPNdB and which are indicated as exempt in Part 2 of the Schedule to the Noise Restrictions Notice and the take-off or landing of such aircraft shall not count towards the Quota.

- 5.3.3 Each aircraft operating in the night quota period shall contribute a QC amount to a total Quota which must not exceed a predetermined limit. In addition, there shall be a maximum number of permissible movements during the night quota period. For the designated London airports, these limits for the summer (April to October) or winter (November to March) seasons are:

Airport	Permitted Movements	Permitted Quota
Heathrow	5,800	9,180
Gatwick	14,4500	8,200
Stansted	12,000	7,960

T2 Night quota period restrictions at the designated London airports



5.3.4 In addition, aircraft with a Quota Count of more than 2 may not be scheduled to take-off or land at any of the designated London airports during the night quota period.

5.3.5 The current application by London Luton Airport includes proposals for the following annual restrictions to apply if the proposed development is permitted:

Permitted movements (night quota period): 10,200

Permitted quota (night quota period): 5,000

Within 6 months of introduction of the Quota Count system, no aircraft with a QC of more than 2 will be permitted to take off or land in the period 23h00 to 06h00.

5.3.6 Whether the current proposals are appropriate for London Luton Airport or can be considered to have real weight in terms of restricting operations is examined in Section 6.1.

6 S 106 AGREEMENT and PLANNING CONDITIONS

6.1 Quota Count

Proposed Movement Limits

6.1.1 During the night quota period (23h30 to 06h00) the Airport proposes to limit the total number of aircraft movements to 10,200.

6.1.2 Information provided by the Applicant's noise specialist, which is not contained in the ES, indicates that the actual number of night quota movements expected to occur in 2028 with the development in place is 9,628 (6,481 arrivals and 3,147 departures). This is the basis on which night time noise contours have been prepared and there is therefore no specific reason why this should not be the number that forms the agreed movement limit.

6.1.3 It should also be noted that this movement limit does not affect aircraft operations between 23h00 and 23h30 or 06h00 and 07h00. Table 6.14 on page 52 of the Annual Noise Monitoring Report for 2011 indicates that there were 12,616 movements during the full night time period (23h00 to 07h00). Again, comparing Figure N(3)-1 and N3(3) of ES Chapter 12 Appendix N(3) it can be estimated that the number of movements during the 8 hour night period would be more than 30% higher in 2028 with the development in place than in 2011.

6.1.4 What this indicates, therefore is a significant increase in the number of movements during the shoulder periods when people living nearby are still vulnerable to night time effects such as sleep disturbance. In fact, the number of movements during the shoulder periods could double, and there is nothing in the S106 Agreement to address this particular issue.

Proposed Quota

6.1.5 During the night quota period (23h30 to 06h00) the Airport proposes to limit the Quota to 5,000, with a statement that this figure is to be reviewed within five years of the commencement of the development to seek a further phased reduction beyond 2020.



- 6.1.6 In order to test whether this is a figure that accurately represents the night time noise impact forecast in the ES, we have again been supplied with some information by the Applicant's noise specialist which is not contained in the ES.
- 6.1.7 For the year 2028 with the development in place, a Quota Count of fractionally under 4,500 would be all that is required assuming that none of the aircraft are modernised and the most pessimistic assumptions are made about the QC value associated with each aircraft type. That is to say each of the 9,628 movement occurring during the night quota period are by variants aircraft that have the highest QC values attributable to the type. If one were to assume that each of the movements was by variants that have the lowest QC values attributable to the type, the Quota Count would fall to fractionally below 2,250.
- 6.1.8 These figures, already potentially well below the sought 5,000, do not take into account the benefits to be derived from fleet modernisation. If part fleet modernisation occurs (half of the relevant aircraft types are replaced with modern, low noise variants) the required quota count figures reduced to fractionally below 3,800 (pessimistic QC values) and 1,800 (optimistic QC values). If full fleet modernisation occurs (all of the relevant aircraft types are replaced with modern, low noise variants) the required quota count figures reduced to fractionally below 2,850 (pessimistic QC values) and 1,300 (optimistic QC values).
- 6.1.9 What this analysis indicates is that the permitted Quota must be very carefully defined if it is to:
- Properly reflect the aircraft movements assessed in the ES, including any suppositions about quieter models operating as part of a fleet modernisation program.
 - Have meaning as a control mechanism that limits the levels of night time noise to which people are exposed if the development does take place.
- 6.1.10 We suggest it is appropriate to define values for these figures that accurately reflect the operation numbers and noise impacts predicted for the various years of operation in the ES. Since the ES is predicated on partial fleet modernisation occurring as a minimum, then the appropriate Quota Count value that should for part of the controls written into the Section 106 Agreement will be between 1,800 and 3,800 depending on whether optimistic or pessimistic views on the noisiness of the particular variants are taken.
- 6.1.11 Unless the Applicant wishes to define a more precise figure which is derived on a more detailed analysis of the actual aircraft expected to operate at the Airport in 2028, we recommend an appropriate figure that reflects a balanced view of the actual requirement is midway between the two extremes, namely 2,800.

Low Noise and Exempt Aircraft

- 6.1.12 The Quota Count system is most successful at encouraging airports to prevent operations at night by the noisiest of aircraft. For example, the designated London airports ban outright operations by QC8 and QC16 at any time during the night and ban QC4 aircraft during the night quota period. Furthermore, airports are effectively permitted to significantly increase the



number of aircraft noise events to which individuals may be exposed by scheduling 4 aircraft rated at QC 0.5 or 8 aircraft rated QC 0.25 in place of 1 aircraft rated at QC2.

6.1.13 While on balance the QC philosophy would have it that these are entirely equivalent in noise terms, the following matters are worth considering:

- As the QC values are banded in 3dB steps it does not automatically follow that, for example, a QC1 aircraft is 3dB quieter than a QC2 aircraft: in fact it might only be 0.1dB quieter, indistinguishable in noise terms to people with normal auditory perception. A large number of aircraft operating at the top end of the range permitted for a relatively low QC class could generate significantly more noise overall than the pro rata permitted number of higher QC aircraft if they generate noise at the low end of the permitted range.
- Exempt aircraft are completely unrestricted within the Quota system, but that does not mean they generate no noise whatsoever. Unless the overall movements cap provides meaningful control on operations by the lower noise generating aircraft, they could be a significant source of disturbance that falls outside the proposed night noise policy.
- The APF recognises that there is relatively higher annoyance caused by high numbers of lower noise flyovers as compared to that caused by small numbers of higher noise flyovers.

6.1.14 The Quota system deals with night time aircraft noise in a narrow and particular way and fails to take the above issues into account. If it is to be implemented, it should only be considered one part of the comprehensive package of night time noise controls.

6.2 Prohibition of noisiest aircraft at night

Ban on QC>2

6.2.1 Paragraph 1.2 of the Proposed Section 106 Agreement Heads of terms states:

- (a) *Within six months of either the commencement of development or approval of the QC system above by LBC, LLAOL will not permit movements at night (23.00 to 07.00) by any aircraft with a QC value of more than 2.*

6.2.2 It should be noted that the Annual Noise Monitoring Report 2011 indicates that there were no night time movements of aircraft with a QC value greater than 2. In fact, of the all the aircraft types identified as operating at night during those years, the only ones rated as QC2 are the Boeing 727-100 (on departure and arrival) and the Airbus A300 (some variants on departure).

6.2.3 There was only 1 movement of the 727-100 during 2010 and none during 2011. There were 472 movements of the A300 in 2010 (around 3.9% of the total) and 420 in 2011 (around 3.3% of the total), but how many of these were departures is not known.

6.2.4 On balance therefore, the ban on aircraft with a QC value in excess of 2 could only be considered as formalising the status quo and not offering anything new or better in terms of noise control moving forward.



Phasing out QC>1

6.2.5 Preferable would be to offer to ban all aircraft with a QC value in excess of 1 from operating during the night time, as this would only affect less than 4% of currently operating types and demonstrate a real commitment to reducing the night time noise impact if the proposed development is permitted. In this regard paragraph 1.2 of the Proposed Section 106 Agreement Heads of terms states:

- (b) *Within two years of the commencement of development or approval of the QC system above by LBC, whichever is the later, LLAOL will submit a scheme for encouraging the phasing out of night time (23.00 to 07.00) operations by aircraft with a QC value of greater than 1 on either departure or arrival.*

6.3 Noise Violation Limits

6.3.1 Paragraph 1.3 of the Proposed Section 106 Agreement Heads of terms states:

- (a) *From 1 January 2015 or within six months of the commencement of development whichever is the later, LLAOL will lower the maximum night time noise violation limit between the hours of 23.00 and 07.00 local time, as recorded by departing aircraft at the fixed noise monitoring terminals, to 80 dB(A) Lmax (from 82 dB(A) Lmax); LLAOL will demand payment of a surcharge by any airline for any incident involving the breach of this limit by its aircraft. The fines for infringement will be in line with the published levels in the existing annual report published by the airport, which is up to 600% of landing fee. Receipts from the fines will be paid into the Community Fund.*
- (b) *LLAOL will review this night time limit five years from its introduction and submit the outcome of this review to LBC. If at the point of such review there are less than 3% of departing aircraft between the hours of 23.00 and 07.00 local time recorded as emitting more than 77 dB(A) Lmax, the night time limit will be lowered to 77 dB(A) Lmax. This review process will be repeated every five years until it results in a lowering of the night time limit to 77 dB(A) Lmax.*
- (c) *From commencement of development LLAOL will implement a progressive lowering of the daytime noise violation limit, from the current value of 94 dB(A) and LLAOL will demand payment of a surcharge by any departing airline for any incident involving the breach of this limit by its aircraft. The progressive lowering of daytime noise violation limit will be as follows:*
 - (i) *85 dB(A) from the date of the commencement of development*
 - (ii) *82 dB(A) from 1 January 2015*
 - (iii) *80 dB(A) from 1 January 2020*

The fine for infringement will be in line with published levels in the AMR which is up to 400% of landing fee. The fines will be paid into LLAOL's Community Fund.



- 6.3.2 By applying only a single daytime limit and a different single night time limit, the noise violation limits scheme as it stands can control only the noise generated by the noisiest operating aircraft. The night noise violations information set out in Chapter 12 Appendix N(10) indicates that in 2011, 9 violations by aircraft type A300 were recorded together with 2 by type Gulfstream III and 1 by type Falcon 50. This is useful information and helpful in sanctioning night time operations by a very small number of the noisier aircraft, but it does nothing to modify or control the noise generated by the much larger number of less noisy aircraft which make a substantial contribution to the overall noise climate.
- 6.3.3 As an example, consider that in 2011, there were 420 night time operations by Airbus A300s. These are known to be the noisiest aircraft types operating at night with QC values on departure and on arrival of up to 2, depending on engine variant. On the other hand, there were 3,251 night time operations by Airbus A320s, and these are less noisy aircraft types with QC values on departure and on arrival of up to 0.5 or 1 depending on engine variant. This means, in round terms, that the A320 should generate noise that is 3 to 6dB lower in level than an A300.
- 6.3.4 Therefore, the A320 could operate in a manner that causes it to generate noise at any given monitoring location that is 2.9dB to 5.9dB higher than would be expected from the modelling of normal flight behaviour, without that monitor registering any type of violation. While the aircraft is still registering overall noise levels that are lower than those generated by the A300, the sheer number of movements by the A320 mean that it could have a significant effect on the average noise levels and be a source of potentially significant disturbance to people who are affected.
- 6.3.5 This logic applies to all aircraft types which have lower noise classification than the A300, and therefore points to the need, or at least the desire, to implement a noise violation limit scheme that fairly penalises any aircraft that is operating outside its normal parameters. Such a scheme responds much better to the proposition that a large number of movements by relatively quieter aircraft are more disturbing than a small number of movements by relatively noisier aircraft, even if the two operating scenarios give rise to similar or equal average noise levels.
- 6.3.6 One way of framing this would be to set different noise violation limits for different classifications of aircraft, thereby ensuring that the noise generated by all aircraft is monitored and tested against a suitable standard. One convenient way of classifying aircraft is to use the already established Quota Count system as referred to in paragraph 5.2.9 above, as all aircraft types can be easily classified according to the noise they generate using an established and widely applicable methodology.
- 6.3.7 Applying this principle, and adopting the noise violation limits proposed for the noisiest aircraft in the S106 Heads of Terms, gives rise to the following limits by aircraft classification.



Aircraft Classification on Departure	Limit dBA
QC 4 (daytime only)	85
QC 2	82
QC 1	79
QC 0.5	76
QC 0.25	73
QC Exempt	70

T3 Proposed noise violation limits by aircraft noise classification

- 6.3.8 The philosophy is that by running a system that penalises every aircraft type that generates noise higher in level than its normal characteristic, the Airport should be able to better manage all movements. This in turn would lead to tighter and more transparent controls on the overall noise climate in the surrounding community.
- 6.3.9 The limits proposed in Table T3 have not been accepted by the Advisors to LLOAL on the basis that London Luton Airport already has the most stringent night time noise violation scheme in the UK, and the proposals set out above would be both counter-productive and too complicated. It is claimed in addition that the commitment to encourage 100% modernisation of part of the fleet (Paragraph 1.5 of the Proposed S 106 Heads of Terms) renders changes to the noise violation limits unnecessary.
- 6.3.10 We accept that the limits proposed in the Proposed Section 106 Heads of Terms will serve to improve the situation at London Luton Airport by virtue of the reductions being proposed. We cannot verify that these are the most stringent being operated in the UK, nor can we foresee why the scheme we are proposing will be counter-productive, although we do accept it will be more complicated. That does not necessarily mean it will be too complicated, as the we understand monitoring and analysis facilities are available to identify the levels produced by every aircraft operating at London Luton Airport, and it would just mean comparing those levels to a category specific noise limit rather than a single limit.
- 6.3.11 The Airport will be committing to specific daytime and night time noise contour envelopes by virtue of the Proposed Planning Condition. The noise generated by every aircraft operating at the Airport will contribute to one of those envelopes and therefore there is much merit in the Airport being able to sanction every operation that generates 'more than its fair share'. Therefore, we recommend a categorised noise violation scheme of the type set out above and recommend that the Airport be encouraged to consider adoption of such a scheme if not immediately, then at least some time in the future, e.g. within five years of the commencement of the development.
- 6.3.12 The noise limits set out in Table T3 above would be subject to discussion and review with the Airport's advisors: the principle of the approach is as important as the specifics of the scheme. Furthermore, they could be reviewed over time in a manner as suggested in the S106 Heads of Terms. If the daytime limit is eventually reduced to 80dBA by January 2020, this would



effectively mean that no aircraft with a QC value at the upper range of 2 or more would operate at the airport at any time. If the night time limit is similarly reduced, the 77dBA value would effectively restrict operations to aircraft not louder than the mid range of QC1 values.

- 6.3.13 This system, if already implemented, would have led to more stringent controls on the two other aircraft types that caused violations of the noise limits scheme. The Gulfstream III is rated as QC4 on departure. It would not be permitted to operate at night at all under the current scheme and would be strictly monitored during daytime operations. The Falcon 50 is rated at QC0.5 on both departure and landing, and under the proposed scheme would be monitored against a violation limit of 76dBA. The fact that one of this aircraft type violated a limit of 82dBA suggest that it was being operated well outside the noise restriction regime currently in force at Luton.
- 6.3.14 The more stringent violation limits applied to different aircraft classifications would have either caught erratic operations by certain aircraft earlier or imposed a much more significant penalty for one off transgressions. Either way, the result would have been better operations management and better noise control.

6.4 Noise Insulation Scheme

- 6.4.1 A new noise insulation scheme is being proposed for domestic dwellings. Any property housing residents that are affected by noise, including but not restricted to those exposed the highest noise levels (i.e. 63dB $L_{Aeq,16h}$ or higher) will be eligible to apply.
- 6.4.2 It is proposed that the new scheme will be funded by a new Noise Insulation Fund which will have an initial tranche of funding to the tune of £100,000 subject to, and introduced on 31 January of the year following the proposed development going ahead. On the 31 January of each following year, further funding will be introduced to ensure that £100,000 remains available for the scheme.

New Scheme

- 6.4.3 It is not entirely clear how the new scheme differs from the scheme introduced as part of the 2006 draft Master Plan. The eligibility criterion remains unaltered (63dB $L_{Aeq,16h}$); the range of properties available for mitigation under the scheme is no more extensive.
- 6.4.4 It is suggested that the scheme would be administered by the London Luton Airport Consultative Committee (LLACC), thereby ensuring that the fund would be used to represent both the Airport and the local community interests. This is a relatively normal state of affairs at most airports running such a scheme and does not obviate the need for establishing proper and reasonable eligibility criteria.

Eligibility Criteria

- 6.4.5 The eligibility criterion of 63dB $L_{Aeq,16h}$ is that at which the Government expects airport operators to offer acoustic insulation to properties already affected by noise at this level or expected to be exposed to noise at this level as a result of growth in operations. These



measures are effectively set out in the ATWP, paragraphs 3.15 to 3.27. They are reinforced by paragraphs 3.36 3.41 of the current APF. The proposals, therefore, might be considered the minimum that the Airport would be expected to offer to be consistent with Government strategy.

6.4.6 Furthermore, paragraph 3.41 of the APF states:

Airports may wish to use alternative criteria or have additional schemes based on night noise where night flights are an issue. Airport consultative committees should be involved in reviewing schemes and invited to give views of the criteria to be used.

6.4.7 This is an aspect of operational noise that the proposed new noise insulation scheme fails entirely to address. In this regard, it is inferior to schemes that have been approved and implemented at other commercial airports and which make particular provision for people affected by aircraft noise at night. For the proposed scheme at Luton to be consistent with current best industry practice the eligibility criteria should be extended to include:

- Residences within the 55dB $L_{Aeq, 8h}$ night-time noise contour. Habitable rooms which are used as bedrooms in those properties shall qualify for inclusion in the noise insulation scheme.
- Residences at which a noise level in excess of 90 dB SEL occurs at an annual average frequency of once or greater during the night time (23h00 to 07h00). Habitable rooms in those properties which are used as bedrooms shall qualify to be included in the noise insulation scheme.

6.4.8 To be fully consistent with the strategy aims set out in the APF, these two additional eligibility provisions would also apply to windows of rooms in other noise sensitive buildings, such as schools or hospitals, that are used as bedrooms.

Ground Noise

6.4.9 Noise from aircraft operations on the ground is also covered by the noise insulation scheme in force at other airports. For the proposed scheme at Luton to be consistent with current best industry practice the eligibility criteria should be extended to include:

- Residences within the 55dB $L_{Aeq, 16h}$ daytime ground noise contour. Habitable rooms in those properties shall qualify for inclusion in the noise insulation scheme.
- Residences within the 48dB $L_{Aeq, 16h}$ night time ground noise contour. Habitable rooms which are used as bedrooms in those properties shall qualify for inclusion in the noise insulation scheme.

Road Traffic Noise

6.4.10 Noise from road traffic travelling to and from the Airport should also be covered by the noise insulation at Luton in order to be consistent with current best industry practice the eligibility criteria should be extended to include:



- Residences exposed to road traffic noise in excess of 66dB $L_{Aeq, 16h}$ façade incident daytime noise level and which will experience a road traffic noise increase of not less than 1dB as a result of the proposed development. Habitable rooms in those properties shall qualify for inclusion in the noise insulation scheme.
- A schedule of areas or road segments that are to include properties likely to be eligible, this schedule to be agreed with the Airport based on a comprehensive road traffic noise assessment over a suitable geographic area .

Precedents

- 6.4.11 The eligibility criteria outlined above are in force at Robin Hood Airport Doncaster Sheffield and set out in the Third Schedule: The Quiet Operation Policy of the Section 106 Agreement first executed in 2002.

Funding and Uptake

- 6.4.12 The provisions proposed in respect of funding mean that in no year will there be more than £100,000 available from the Airport to cover the cost of providing the required mitigation. This may not give rise to practical difficulties for reasons referred to below, but in the hypothetical case whereby a large number of applications were made in a short period of time, and all were deemed eligible, the funding limit would have the effect of rationing the mitigation measures.
- 6.4.13 Rationing is undesirable on the basis that it could discriminate against individuals who have a clear right to mitigation under the terms of the scheme, but may be prevented from benefitting from the required measures for an unacceptably long period of time. Provisions to prevent this from happening and ensure that mitigation can be supplied not later than 6 months (say) from determination of eligibility should be incorporated into the scheme, even if it requires increases in the funding to be made available.
- 6.4.14 Having said that, the popularity of noise insulation grant schemes tends to be low due the restrictions placed on what can be provided under the scheme. Normally the modifications are limited to the provision of secondary glazing plus alternative means of ventilation if necessary. Secondary glazing, while technically effective at reducing sound transmission, is often considered visually unappealing and results in the loss of exposed/accessible window sills internally.
- 6.4.15 There may be situations in which alternative modifications to existing glazing is expected to give rise to noticeable noise benefits. Such a situation might arise where existing single glazed windows are in poor condition and seals at opening lights are ineffective or non existent. In these circumstances, replacing the units with modern well sealed, narrow cavity thermal double glazing, could give rise to significant noise intrusion benefits.
- 6.4.16 We recommend that each eligible property should be assessed on its merits, and there should be some discussion on whether the scheme could be drafted to cover such modifications, or make a suitable financial contribution to such modifications.



7 CONCLUSIONS

- 7.1 This report has set out the results of a review of the noise implications of an application by London Luton Airport Operations Limited (LLAOL) for various improvements to the terminal building, car park and aircraft stands, together with dualling of Airport Way.
- 7.2 We have considered whether the application will result in noise impacts which are consistent with National Government and Local Authority policies, and whether they have been assessed in accordance with established practice and against recognised standards.
- 7.3 So far as airborne aircraft noise is concerned, we have no significant reservations about the methodology employed. In numerical terms we believe the contours and footprints presented in the ES reasonably reflect the expected noise impact. We take the view that the assessment is in line with current Government policy contained in the Aviation Policy Framework, providing real traction is gained by the commitment in the Proposed Section 106 Agreement that the Airport will seek to continually increase the percentage of flights undertaken by modernised low noise variants of relevant aircraft types.
- 7.4 Noise from aircraft on the ground and noise from road traffic associated with the Airport have been assessed, and we have identified that some noise impacts do arise. These could be suitably mitigated by ensuring that the Noise Insulation Scheme defined in the Proposed S 106 Agreement incorporates qualification thresholds that address ground and road noise effects. However, the scheme as currently drafted contains no provisions to address these matters and we therefore have potential noise impacts arising from the proposed development that are neither controlled nor mitigated.
- 7.5 With regard to the operation of aircraft at night, this is known to be a particular concern to residents living in the local community. Our assessment indicates that the controls that are being proposed for one part of the night (23h30 to 06h00) are not necessarily sufficiently stringent to ensure operations fully in line with the impact indicated in the ES. Furthermore no specific controls are proposed for aircraft operating in the early morning shoulder period of 06h00 to 07h00, for which the number of movements is expected to increase substantially if the development goes ahead. The effects of potential sleep disturbance need to be properly considered through appropriate controls and/or mitigation measures which would normally be set out in the Proposed Section 106 Agreement. The scheme as currently drafted contains certain provisions to address night time noise issues. However, contrary to the advice in Paragraph 3.41 of the Aviation Policy Framework, the Noise Insulation Scheme does not specifically deal with mitigating the effects of night time noise.
- 7.6 In relation to the noise violation limits, an improved situation is offered in the Proposed Section 106 Agreement Heads of Terms. However, we have proposed that it would be better to set different noise violation limits for different classifications of aircraft, thereby ensuring that the noise generated by all aircraft is monitored and tested against a suitable standard. A possible means of achieving this aim, using the already established Quota Count system, is proposed.
- 7.7 We have proposed modifications to the Noise Insulation Scheme, which would benefit those people most affected by individual flyovers occurring at night that have the potential to disturb



sleep. We also recommend that the scheme be extended to cover those individuals who are affected by ground noise and noise from road traffic associated with the Airport subject to certain established standards being exceeded.

■ End of Section



Glossary of Acoustic Terms

L_{Aeq} :

The notional steady sound level (in dB) which over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measurement over that period. Values are sometimes written using the alternative expression dB(A) L_{eq} .

L_{Amax} :

The maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise when occasional loud noises occur, which may have little effect on the L_{Aeq} noise level. Unless described otherwise, L_{Amax} is measured using the "fast" sound level meter response.

L_{A10} & L_{A90} :

If non-steady noise is to be described, it is necessary to know both its level and degree of fluctuation. The L_{An} indices are used for this purpose. The term refers to the A-weighted level (in dB) exceeded for n% of the time specified. L_{A10} is the level exceeded for 10% of the time and as such gives an indication of the upper limit of fluctuating noise. Similarly L_{A90} gives an indication of the lower levels of fluctuating noise. It is often used to define the background noise.

L_{A10} is commonly used to describe traffic noise. Values of dB L_{An} are sometimes written using the alternative expression dB(A) L_n .

L_{AX} , L_{AE} or SEL

The single event noise exposure level which, when maintained for 1 second, contains the same quantity of sound energy as the actual time varying level of one noise event. L_{AX} values for contributing noise sources can be considered as individual building blocks in the construction of a calculated value of L_{Aeq} for the total noise. The L_{AX} term can sometimes be referred to as Exposure Level (L_{AE}) or Single Event Level (SEL).

Perceived Noise Level

Perceived Noise Level: this measure is used specifically for the evaluation of aircraft noise, taking account of the high pitched whine generated by jet engines. There is an approximate relationship between the PNL and the A-weighted noise level as follows:

$$PNL = L_A + 13\text{dB}$$



EPNdB

Effective Perceived Noise Level: this is calculated by integrating the energy over the time period during which the tone corrected perceived noise level is within 10PN dB of the maximum value and normalising with respect to a reference time of 10s.

