

**Doc. No. SSE/12/a  
Case Ref. 2032278**

Appeal by BAA Ltd and Stansted Airport Ltd following the refusal by Uttlesford District Council of planning application UTT/0717/06/FUL

## **Proof of Evidence on behalf of Stop Stansted Expansion**

### **Ground Noise**

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## 1 INTRODUCTION

### 1.1 Personal details

- 1.1.1 My name is Martin Peachey and I appear at the Public Inquiry on behalf of Stop Stansted Expansion ('SSE'). I have been assisted in the preparation of this proof of evidence by other members of the SSE Noise Group, particularly Chris Bennett.

### 1.2 Qualifications and experience

#### Martin Peachey

- 1.2.1 MA Cantab Mechanical Sciences.
- 1.2.2 Now retired after 35 years in business development and management for commercial companies in airport systems, facilities management and air traffic management following 11 years in the Royal Navy as an engineer officer.

#### Chris Bennett

- 1.2.3 BA Oxon in Modern Languages.
- 1.2.4 SSE Executive Committee member and Chairman of SSE Noise Group from inception (2003) until 2007.
- 1.2.5 For the last 11 years I have lived approximately 13 miles from the airport under one of the Runway 23 approach routes.

## 2 SCOPE OF EVIDENCE

### 2.1 Core evidence

- 2.1.1 Our evidence relating to ground noise impacts was originally set down in Chapter 9 of Volume 1 of SSE's submission to UDC, July 2006 [CD/201] which addressed the information provided by BAA in Volume 8 of its Environmental Statement [CD/11].
- 2.1.2 Further evidence on ground noise issues was included in Volume 3 of SSE's submission to UDC, November 2006<sup>1</sup> dealing with the additional information provided by BAA in response to a Regulation 19 Notice from UDC [CD/22].
- 2.1.3 That evidence is superseded by this submission which incorporates more recent data now available and further analysis carried out.

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<sup>1</sup> CD/203, para 2.7.

### 3 GROUND NOISE IMPACTS

#### 3.1 Background

- 3.1.1 The analysis of the impact of ground noise presented in support of BAA's planning application, as contained in Volume 8 of the BAA Environmental Statement [CD/11], is incomplete and selective. Important items of information requested by UDC have either not been supplied or have been supplied with inadequate details. In some cases the information supplied by BAA is misleading; in other cases it is incorrect.
- 3.1.2 We discuss below the inadequacy of the information supplied and the misleading nature of BAA's presentation of the predicted ground noise impacts of the proposed development. When these shortcomings are understood and the true position becomes clearer it becomes apparent that this application, if approved, would give rise to highly adverse ground noise impacts; there would in fact be a very significant increase in disturbance for many communities in the vicinity of the airport.

#### 3.2 Inadequacy of information supplied by BAA

- 3.2.1 The methodology used by BAA is to compare predicted ground noise sound levels for its 25mppa and 35mppa scenarios. The corresponding annual Air Traffic Movement (ATM) figures are taken as 216,000 and 264,000 respectively. There are no calculations for the current level of activity and so noise comparisons for the increased usage over current conditions are not adequately provided for. This results in a distortion of the actual increase in noise since the comparisons start from a higher baseline. Furthermore, this planning application is seeking to remove the passenger limit. This could lead to 40mppa in 2014, 45mppa in 2021 and 50mppa in 2030. Noise produced by this increased level of passengers should have been included in the calculations, including the impact from road noise.

- 3.2.2 The UDC Scoping Opinion [CD/24] requested that:

*'Ground noise contours be prepared for on airport activity, increased surface access movements, and for a combination of both sources.'*

The last item is important since noise is noise from wherever it emanates. This request is consistent with the requirement under Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) Regulations 1999 [CD/309] for the applicant to provide an assessment of the:

*'... direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects, resulting from the existence of the development'*.

BAA specifically excludes the provision of combined contours saying this would be 'difficult to interpret'.<sup>2</sup> This is not a valid reason for the lack of provision. Whether or not difficult to interpret, the total increase in airport-related noise is the key issue and this data is needed if a full and proper assessment is to be made.

Furthermore, ground noise and air noise are addressed in separate volumes of the BAA Environmental Statement, Volume 2 for air noise and Volume 8 for ground noise.<sup>3</sup> No information is provided by BAA on the cumulative effects of these two sources of noise and it is this cumulative effect of noise disturbance that matters for those living in the vicinity of the airport. The human ear will hear the cumulative

<sup>2</sup> CD/11, para 3.1.2.

<sup>3</sup> CD/5 and CD/11 respectively.

effect of all noise sources at any given moment. Volumes 2 and 8 of the BAA Environmental Statement both present partial and misleading analysis of the air and ground noise effects, in each case playing down the scale of the adverse impacts.

- 3.2.3 The assessment methodology is restricted to 'the main sources of ground noise associated with the 25mppa and 35mppa cases'<sup>4</sup> and BAA indicates that the assessment considers only noise from aircraft taxiing and auxiliary power units.<sup>5</sup> This is not the total amount of noise and whilst the other sources are less in magnitude, all of the contributory factors to airport-related ground noise should have been assessed. However, ground power units, other mobile equipment and engine ground running are all excluded from BAA's assessment.<sup>6</sup>
- 3.2.4 We are told that the ground noise impacts have been modelled 'using best practice' but there is only a brief description of what this means.<sup>7</sup> This lack of transparency serves to further reduce confidence in the veracity of the results presented.
- 3.2.5 BAA states that road traffic noise is only assessed on the basis of overall levels proportional to 35mppa and not to specific locations.<sup>8</sup> This ignores the fact that the impact will give rise to specific excesses of noise at certain points along access roads.
- 3.2.6 CD/11, para 5.2.12 states:

*'There are no infrastructure changes proposed to the existing rail access to the Airport under the 35 mppa case. For this reason, there is no further consideration of airport related rail traffic noise in this assessment.'*

However, as we show in our evidence relating to rail surface access [SSE/14/a], BAA envisages increasing the Stansted Express from 8 to 12 car trains for 35mppa. More rolling stock will produce more noise and this should have been included in the assessment.

### 3.3 Noise levels

- 3.3.1 The respective baseline background sound levels are not provided for the 1999 and 2004 measurements.<sup>9</sup> This data and the corresponding number of ATMs should be provided in order to assess the trend. And more recent data than 2004 should have been provided.
- 3.3.2 BAA states<sup>10</sup> that it has adopted the following benchmark figures and referenced them to health guidance published by the World Health Organisation ('WHO'):

*'55 LAeq for the day and evening and 65 LAmax for the night time'*

These figures are incorrect. They are higher in value by 5 dB than the referenced WHO 'Guidelines for Community Noise' [CD/286] which show the following:

<sup>4</sup> CD/11, para 5.1.1.

<sup>5</sup> Ibid, para 6.1.2.

<sup>6</sup> Ibid, paras 5.2.6 and 5.2.9.

<sup>7</sup> Ibid, para 5.3.1 et seq.

<sup>8</sup> Ibid, para 5.2.11.

<sup>9</sup> Ibid, para 5.3.20.

<sup>10</sup> Ibid, para 5.3.22.

**Table 1: WHO Guideline Values**

Specific environment	Critical health effect(s)	LAeq (dB)	Time (hours)	LMax (dB)
Outdoor living area	Serious annoyance daytime and evening	55	16	-
	Moderate annoyance daytime and evening	50	16	-
Inside bedrooms	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

Source: WHO 'Guidelines for Community Noise', Chapter 4, Table 4.1.

3.3.3 The origin of, or authority for, the claim that 'The WHO guidelines represent observation thresholds below which defined noise effects can be assumed to be less significant or unimportant'<sup>11</sup> is not clear. The WHO document states:

*'guideline values are summarized with regard to specific environments and effects. For each environment and situation, the guideline values take into consideration the identified health effects and are set, based on the lowest levels of noise that affect health (critical health effect).'*<sup>12</sup>

The Guideline Values and protective standards reproduced in the above table are derived from observations of the health effects of noise on normal or average populations. This means that vulnerable groups of people such as the elderly, the ill and young children are typically under-represented. There are further precautionary recommendations given for such vulnerable groups in the WHO Guidelines which state that 'these people may be less able to cope with the impacts of noise exposure and be at greater risk for harmful effects'.<sup>13</sup>

3.3.4 BAA interprets PPG24 [CD/110] as follows:

*'The LAeq benchmarks represent outdoor sound levels below which, according to PPG24, environmental noise (airport ground noise is a type of environmental noise) need not be considered as a determining factor when considering planning applications for new housing. The assumption is made in this assessment that it is reasonable to apply these sound levels the other way around, ie that sound levels below these benchmarks need not be considered as determining factors when considering planning applications for new and potentially noisy development.'*<sup>14</sup>

We question this logic and note that background noise levels are low in the area.

<sup>11</sup> CD/11, para 5.3.23.

<sup>12</sup> WHO 'Guidelines for Community Noise' [CD/286], Chapter 4, 'Guideline Values'.

<sup>13</sup> Ibid, Chapter 3.

<sup>14</sup> CD/11, para 5.3.24.

- 3.3.5 BAA seeks to downplay the significance of night noise because studies have had differing results.<sup>15</sup> However, we consider the likelihood of sleep disturbance to be very high at the chosen night-time benchmark figure of 65 dB L<sub>A</sub>max. Additionally, the attenuation figures used seem too high, even allowing for variations due to the type of window and wall design. The stated typical outdoor to indoor attenuation of 15 to 20 dB with a window left open is higher than the WHO Guidelines figure of 15 dB from outside to inside with the window open. We understand that typical figures for triple glazed windows in a wall with wool cavity insulation are about 10 dB attenuation when open, 15 dB when partly open and >25 dB when closed. Since assessments should be focused on windows being open, the L<sub>A</sub>max night-time benchmark measured outdoors should be between 55 and 60 dB.

### 3.4 Noise assessment issues

- 3.4.1 BAA warns<sup>16</sup> that the 'Ground Noise' volume uses the terms 'minor, moderate and major adverse impact' in a different sense from other volumes of the Environmental Statement. A close examination confirms that this is indeed the case. First, a complex set of interlocking exceedance criteria are required to be assessed,<sup>17</sup> the combinations seeming almost to be designed to minimise the likelihood of the system identifying as adverse any impacts that may arise from a comparison between 2005 and the projected 35mppa levels, i.e. the impact that is of most importance to any resident wishing to assess the effects of expansion. Second, the decibel increases (in some cases +10 dB) required to trigger the criteria are high considering that it is apparently Leq measurements that are at issue. Indeed, the WHO *Guideline Values* do not support a figure as high as 10 dB. As can be seen from the table in para 3.3.2 above, the difference between 'moderate' and 'serious' annoyance is 5 dB.
- 3.4.2 The reader must then struggle through the combination of the three separate relevant tables to decipher BAA's assessment of the impact at any one location. It is also important to note that the terms 'no impact', 'minor impact' and 'moderate impact' are qualitative judgements by BAA and relate not to the absolute noise level but to the difference above baseline background levels. Very significant increases in ground noise impacts are understated by BAA using these subjective descriptors. For example, in the 35mppa case and under neutral wind conditions, an increase of 21.7 dBA Leq at Molehill Green above baseline background levels given in Table 6 is revealed in Table 7 to represent a 'moderate impact' when using the criteria shown in Table 1. Considering that an increase of 21.7 dBA is equivalent to more than one hundred fold in the sound pressure level, BAA's qualitative assessment can be characterised as the use of soft language to disguise the seriousness of the impacts that would affect many local residents who live near the airport. On the basis of these descriptors, the disturbance caused by a 'major impact' would be too unbearable to contemplate. We believe that this arbitrary and complicated methodology of calculating the noise impact assessment at the locations chosen is flawed and the results<sup>18</sup> stemming from this seriously understate the ground noise disturbance impacts.
- 3.4.3 Furthermore, BAA appears to have totally excluded two important factors when assessing the noise disturbance impacts.<sup>19</sup> Both exclusions are factors that can considerably increase the adverse effects. The first is the nature or tonality of

<sup>15</sup> CD/11, paras 5.3.25 and 5.3.26.

<sup>16</sup> Ibid, para 5.3.27.

<sup>17</sup> Ibid, paras 5.3.28 and 5.3.29 and Table 1.

<sup>18</sup> Ibid, para 10.1.18, Table 7.

<sup>19</sup> Ibid, para 10.1.18, Table 7.

aircraft noise. Aircraft engines have a distinctive 'whine' or tone, which is more disturbing than a broad range of frequencies. Few people are annoyed by the sound of waves breaking on the beach even though the level of the noise can be high. With regard to aircraft noise BS 4142 states that a +5 dB penalty should be added to adjust figures for tonality. The second exclusion is the effect of the strength and direction of the prevailing wind. This can add up to 10 dB to noise exposure figures for downwind locations. UDC's Regulation 19 Notice [CD/39] asked BAA to provide 'Downwind predictions for ground noise for the various cases studied'.

- 3.4.4 The BAA response [CD/22] did not provide the information requested and the response tried to conceal the true impact by stating in para 2.4.1 that:

*'... Sound levels downwind tend to be marginally higher than under neutral conditions.'*

In addition, BAA incorrectly used only a +3 dB adjustment and the BAA response introduced upwind and side wind conditions which were not required. BAA then used these conditions as a basis for revised predictions at the various locations, thereby creating a false premise on which to base the information provided.

- 3.4.5 Evidence provided to UDC by Bureau Veritas<sup>20</sup> stated that the downwind adjustment should be +10 dB and showed that the impact of noise levels in the downwind direction was seriously understated in many of the chosen illustrative locations. The extent of the understatement can be seen in the summary tables below.

**Table 2: Percentage of locations downgraded to a more serious impact category when adjusted for downwind status (westerly operations)**

Previous (no wind adjustment) category	New (downwind adjusted) category	Day	Evening	Night
no impact	moderate	30%	10%	
moderate	major	10%	10%	10%
minor	major			
no impact	major		40%	50%
Total % of locations changing to a more serious impact category		40%	60%	60%

<sup>20</sup> CD/139 (September 2006).

**Table 3: Percentage of locations downgraded to a more serious impact category when adjusted for downwind status (easterly operations)**

Previous (no wind adjustment) category	New (downwind adjusted) category	Day	Evening	Night
no impact	moderate	10%	20%	10%
moderate	major			10%
minor	major	10%	10%	
no impact	major	50%	40%	50%
Total % of locations changing to a more serious impact category		70%	70%	70%

- 3.4.6 The conclusion, in BAA's response to the Regulation 19 Notice<sup>21</sup> that *'the sensitivity test has not shown any major differences as compared to the original assessment which was reported in ES Volume 8'* is completely at variance with the information given by Bureau Veritas and considerably underestimates the adverse impact.
- 3.4.7 It is clear from the information provided by BAA that the background noise has increased in many areas and it is stated that it 'could be attributed to increased road traffic'.<sup>22</sup> The particular source is relatively unimportant; it is the total noise annoyance that matters and in any event much of the increased road traffic relates to increased airport activity.
- 3.4.8 BAA states that:  
*'the 2004 survey results showed lower overall or ambient sound levels compared to the 1999 survey in most areas around the airport'*<sup>23</sup>  
 but no data are provided to support this assertion.
- 3.4.9 The summary in CD/11 considers only aircraft taxiing and auxiliary power unit ('APU') sound levels<sup>24</sup> and the analysis is a relative one. That is to say it ignores the impact of the predicted level of noise at 25mppa and forms its conclusions only on the basis of the increment between 25mppa and 35mppa. It should also have had regard to the cumulative amount of noise disturbance.
- 3.4.10 BAA's conclusions should also have recognised that ground noise impacts are by their nature very local impacts. Those worst affected by ground noise may number only a few thousand but they would be very adversely affected if the proposed development were to be approved.
- 3.4.11 Figures for 2004 or present day taxiing and APU noise versus benchmarks and background noise are omitted and hence the impacts that people would be able to understand and relate to, namely the predicted ground noise impacts if the application were to be approved compared to the current ground noise impacts, are omitted. This leads to a misrepresentation of the conclusions and, indeed, substantially invalidates them.

<sup>21</sup> CD/9, para 2.4.16.

<sup>22</sup> CD/11, para 8.1.5.

<sup>23</sup> Ibid, para 8.1.6.

<sup>24</sup> Ibid, paras 10.1.17 and 10.1.18.

- 3.4.12 The road traffic model, as described,<sup>25</sup> implies that this part of the assessment focuses primarily on the morning peak hour road traffic predicted for 2014. If this is so, it is inadequate. Road traffic noise nuisance is experienced 24 hours a day and the impacts should have been considered on that basis and alongside all of the other ground noise impacts, and then have been presented on a combined basis. Only then could the cumulative impact of the proposed development be properly understood. It may be, for example, that there is a night-time concentration of impacts from various sources (i.e. aircraft taxiing, APUs, road traffic, airside road traffic and other airport-related operations). If that information were presented, much higher peak ground noise impacts may become apparent for particular times of the day (or night). In the absence of that information, we simply do not know.
- 3.4.13 Although there may be a case for the comparison of ground noise with background noise, the benchmark system does not tell people what they really want to know, which is how much more ground noise will there be compared to today.<sup>26</sup>

### 3.5 Unacceptable impacts from expansion

- 3.5.1 Even with the inadequate or incorrect data and the omissions referred to above, the conclusions in CD/11 show that BAA accepts that more noise will be produced and that the adverse impacts of this will fall most severely upon particular communities in relatively close proximity to the airport.<sup>27</sup> This will cause more disturbance, annoyance and stress to many people in those communities. And it is important to remember that the assessment is not a complete picture. It is not possible to draw reliable conclusions when only a partial picture has been presented of the adverse impacts from ground noise.
- 3.5.2 It is not clear why BAA considers <5 dBA exceedance to be of only 'marginal significance'.<sup>28</sup> It is certainly not for those living nearby. Very significant increases in ground noise impacts arise in the 35mppa case, for example, as shown in 3.4.2 above for Molehill Green. The impacts upon those living near the airport are downplayed by benchmarking against what might otherwise happen using BAA's 25mppa baseline for 2014 and presenting the differential as the projected impact.
- 3.5.3 BAA's 25mppa baseline for 2014 is, of course, hypothetical and it appears to be as close as possible to the limits of its current planning application. For example, as we show in our evidence relating to BAA's air traffic projections [SSE/4/a and SSE/5/a] part of the hypothesis is for BAA to assume that the number of cargo ATMs will more than double between now and 2014 – to the exact limit of its current planning consent for cargo ATMs. This is against a background of a declining number of cargo ATMs over recent years. Naturally this increases the 25mppa baseline substantially compared to today, especially since cargo ATMs tend to be larger and noisier aircraft types, and they impact particularly upon night noise. And having assumed a quite dramatic increase in the number of cargo ATMs for the baseline scenario, BAA then assumes they will reduce under the 35mppa scenario.
- 3.5.4 Ground noise is particularly disturbing at night. Individual noise events are accentuated against the generally lower background noise levels and their impact carries further. In our evidence on surface access (road traffic) impacts [SSE/13/a] we show that the effective nightly respite from airport-related activity, especially road

<sup>25</sup> CD/11, para 10.2.1.

<sup>26</sup> Ibid, para 14.1.1.

<sup>27</sup> Ibid.

<sup>28</sup> Ibid, para 10.1.12.

traffic noise, is less than four hours. This is explained in Volume 11 of the Environmental Statement<sup>29</sup> which shows flight arrival and departure profiles. It is significant that the peak flight departure time is from 0600 to 0900 and peak flight arrival time is from 2200 to midnight. Appendix D in CD/14 advises that most passengers arrive at the airport at least two hours before their flight and take around 45 minutes from landing to leave the airport. These leads and lags contribute to significant ground noise occurring from around 0400 to past midnight. No assessment is provided for the impact of such a short respite period or of the forecast increase in airport-related activity during the night.

3.5.5 There is no attempt to explain the apparent conflict between the proposals and the promise in the Air Transport White Paper [CD/87] that the Government would 'bear down' on night noise.

3.5.6 We refute the final conclusion in CD/11, which states:

*'STAL's existing Ground Noise Management Strategy will ensure that disturbance caused by ground noise is minimised as far as practicable. Therefore no additional mitigation is proposed other than the management controls that have already been adopted.'*<sup>30</sup>

Even having understated the scale of ground noise impacts that would arise from the proposed development, BAA acknowledges that certain communities will be quite badly affected and will suffer increased disturbance and annoyance. In this context, the above statement is scant reassurance to the neighbouring community and is rendered largely meaningless by the phrase 'as far as practicable'.

## 4 CONCLUSIONS

- 4.1 CD/11 provides inadequate information, omits significant noise sources and uses impaired assessments. This unsatisfactory situation does not allow a proper judgement to be made on the ground noise impacts of the proposed development. It is however common ground that the volume of activity both on the airport and from surface access movements would increase significantly if the proposed development were to be approved and that such increases would occur 24 hours of the day. This will increase the amount of disturbance and annoyance experienced by the airport's neighbouring community generally and, at night, when a greater number of people suffer disturbance, the level of intensity will increase.
- 4.2 Noise is a material consideration for this planning application. The relevant planning policies will be set out in other evidence presented by SSE and will not be repeated here. What is important here is to establish the level of the impacts from ground noise. Unfortunately, we cannot fully do that due to the lack of information from BAA. We can however decipher enough of the truth from the raw data included in CD/11 to demonstrate that the ground noise impacts would be far greater than portrayed by BAA. This is the case even though BAA has excluded many impacts; it is the case even at 35mppa and it is the case even when comparing 35mppa to a more reasonable baseline scenario for 25mppa, closer to today's 24mppa.
- 4.3 If the exclusions were also assessed the ground noise impacts of the proposed development would become even more pronounced for the people living in the villages closest to the airport. And if the passenger throughput were to increase to levels much higher than 35mppa, as we believe it would if the application were to be approved, the

<sup>29</sup> CD/14, para 4.2.6, Figs 4.1 and 4.2.

<sup>30</sup> CD/11, para 14.1.5.

impacts would be greater still because this would mean larger and noisier aircraft and it would mean more road traffic and other airport-related noise.

- 4.4 Finally, noise impacts needs to be looked at in the round – the combination of air noise, ground noise and surface access noise – in order to fully assess and understand their scale. BAA has declined to provide the information that would enable us to do that. Nevertheless, there is enough information to indicate that the overall noise impacts of the proposed development would be wholly unacceptable.