











- 1.8 While the numerical thresholds are considered appropriate for local policy decision making, they do not always sufficiently describe the impact of the noise on individuals and therefore may underplay the impacts.

**2. Local Aviation Context**

- 2.1 Whilst Gatwick Airport brings many benefits to the region and the UK economy as a whole it is nonetheless an intrinsically noisy operation that operates 24 hours per day. The airport has the second largest number of air transport movements in the UK but these are not spread equally during the day or night or throughout the year. The nature of the operation at Gatwick means that the noise is worse during the summer period for both day and night compared to the winter period.
- 2.2 As a result of the airport operations the road network has unusual localised traffic patterns and flows with extended day periods of higher traffic levels with shorter periods of lower traffic flows than compared to an area without an airport.

**3. Policy Overview**

- 3.1 The Noise Policy Statement for England (2010) provides overarching policy in relation to noise. It has a stated vision:

*“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.”*

It states that this is a long term desired policy outcome and it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources in all circumstances.

- 3.2 It makes it clear that:

*“There is a need to integrate consideration of the economic and social benefit of the activity or policy under examination with proper consideration of the adverse environmental effects, including the impact of noise on health and quality of life. This should avoid noise being treated in isolation in any particular situation, i.e. not focussing solely on the noise impact without taking into account other related factors.”*

- 3.3 And:

through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

avoid significant adverse impacts on health and quality of life;  
mitigate and minimise adverse impacts on health and quality of life; and  
where possible, contribute to the improvement of health and quality of life.+

- 3.4 These are to be interpreted within the context of the guiding principles of sustainable development: Ensuring a Strong Healthy and Just Society; Using Sound Science Responsibly; Living Within Environmental Limits; Achieving A Sustainable Economy; Promoting Good Governance.

- 3.5 The Explanatory Note to the Policy provides further information on this. It makes it clear that it is impractical to have no noise at all but in achieving the balance *“the NPSE aims to provide the necessary clarity and direction to enable decisions to be made about what is an acceptable noise burden to place on society.”*
- 3.6 It also states that it should *“allow noise to be considered alongside other relevant issues and not to be considered in isolation.”*
- 3.7 The NPSE introduces three adverse effect levels, these being the:

**NOEL (No Observed Effect Level)** the level below which no effect can be detected

**LOAEL (Lowest Observable Effect Level)** the level above which effects on health and quality of life can be detected

**SOAEL (Significant Observed Adverse Effect Level)** the level above which significant adverse effects on health and quality of life occur.

(Note the NOEL and LOAEL are based in principles of toxicology that are currently being applied by the World Health Organisation. The SOAEL is a UK extension of these concepts.)

- 3.8 A fourth threshold of the Unacceptable Exposure Level is introduced by virtue of Paragraph 174 of the National Planning Policy Framework: *“Planning policies and decisions should contribute to and enhance the natural and local environment by:...*

*(e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;”*

- 3.9 In describing the SOAEL the NPSE policy seeks to clarify that:

***It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times.***

*“It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.”*

Aviation Policy

- 3.10 The Aviation Policy Framework 2013<sup>4</sup> framework sets out the detailed approach to aviation, so that benefits of aviation can be realised whilst managing the unwanted aspects. The foreword to the policy concludes:

*“The Government believes that aviation needs to grow, delivering the benefits essential to our economic wellbeing, whilst respecting the environment and protecting quality of life. The way ahead will be challenging as we work together to strike the right balance. But it is critical that we do so in order to safeguard our long-term economic prosperity.”*

- 3.11 The Aviation Policy Framework is written from the perspective of continuing growth of air transport, allowing the expansion of a vibrant industry. This in contrast to the consideration of new development encroaching upon airports. Whilst it made recommendations on the minimum levels at which the airports should offer mitigation for their activities, it did not consider new noise sensitive development encroaching on the airport and a specific policy for this.
- 3.12 In the Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace<sup>5</sup>, the government



northern runway at Gatwick, Crawley Borough Council is still being required to safeguard land for a wide spaced Southern runway.

- 3.16 In Aviation 2050: The Future of UK Aviation (2018)<sup>8</sup> it was acknowledged that *“There is also evidence that the public is becoming more sensitive to aircraft noise, to a greater extent than noise from other transport sources, and that*

The Health Protection Agency (HPA) summary document *Environment Noise and Health in the UK* (2010) (now within ERCD 0907)<sup>11</sup>  
the work of the government-appointed Airports Commission in *Discussion Paper 5: Aviation Noise* (2013)<sup>12</sup>  
*Aircraft Noise Effects on Health* by Dr. Charlotte Clarke, Queen Mary, University of London, for the Airports Commission (2015)<sup>13</sup>

In addition, more recently published work includes:

Environmental Noise Guidelines for the European Region (2018), WHO<sup>14</sup>  
CAP 2161 Survey of Noise Attitudes 2014: Aircraft Noise and Sleep Disturbance<sup>15</sup>

Environmental Noise and Effects on Sleep: An Update to the WHO Systematic Review and Meta-Analysis, Smith et al (2022)<sup>16</sup>

4.2 Through these documents, it is possible to identify three specific areas in which adverse effects of noise exposure can impact on populations and individuals, these being Amenity and Quality of Life; Health; and Learning.

4.3 The evidence for these effects is continuing to increase and this Topic Paper highlights some of these changes, which has informed the approach of Local Plan Policy EP4 and the Local Plan Noise Annex.

## 5. **Effects on Amenity and Quality of Life**

5.1 This form of noise impact may typically affect people in two ways: annoyance, and sleep disturbance.

5.2 Annoyance is considered to manifest itself when noise impact disturbs a ] ^!•[ } q ÁæÁ ÁæÁ ÁæÁ ] | ^!•[ ~ \* @ß interrupting a conversation or causing distraction whilst resting (Airports Commission, 2013). Annoyance will typically increase as noise exposure increases, though changes in pitch and intermittency can also increase annoyance.

5.3 The *Aviation White Paper* (2003) found the onset of community annoyance to occur at 57dB L<sub>Aeq16hr</sub>, a figure that originates from the 1982 Aircraft Noise Index Study (ANIS).

5.4 Over time, individual aircraft have become quieter, but have increased in number. The *Attitudes to Noise from Aviation Sources in England* study (ANASE), DfT, 2007) demonstrated that the number of aircraft had a greater impact on annoyance than increasing average noise levels<sup>17</sup>. This suggests that the level for the onset of community annoyance may actually occur below 57dB L<sub>Aeq16hr</sub>, and that the impact of higher levels of noise may be greater than previously thought. This follows research published by the European Commission with the Environmental Noise Directive (END) in 2002 which

<sup>11</sup> <https://publicapps.caa.co.uk/docs/33/ERCD0907.pdf>

<sup>12</sup> <https://assets.publishing.service.gov.uk/media/5a7cac80e5274a38e57560e7/airports-commission-noise.pdf>

<sup>13</sup> <https://assets.publishing.service.gov.uk/media/5a819b09e5274a2e87dbe879/noise-aircraft-noise-effects-on-health.pdf>

<sup>14</sup> [Environmental noise guidelines for the European Region \(who.int\)](https://www.who.int/publications/m/item/environmental-noise-guidelines-for-the-european-region)

<sup>15</sup> [CAP2161: Survey of Noise Attitudes 2014: Aircraft Noise and Sleep Disturbance \(caa.co.uk\)](https://assets.publishing.service.gov.uk/media/5a7cac80e5274a38e57560e7/airports-commission-noise.pdf)

<sup>16</sup> [Environmental Noise and Effects on Sleep: An Update to the WHO Systematic Review and Meta-Analysis - PubMed \(nih.gov\)](https://pubmed.ncbi.nlm.nih.gov/39888888/)

<sup>17</sup> Some aspects of the ANASE methodology have been questioned at peer review.



established. Acute noise exposure has also been linked to other forms of physiological activation including peripheral vasoconstriction with relative withdrawal of blood from the skin and increased peripheral vascular resistance.

- 7.4 It has been shown that there is an association between high noise exposure and poor long-term memory and reading comprehension amongst children living around airports. Research has also suggested that the source of noise may be a factor, with the European RANCH<sup>23</sup> study finding road traffic to have no observed effect on impaired reading comprehension and recognition memory in children exposed to aircraft noise.
- 7.5 The Airports Commission (2013) notes that the productivity impacts of noise are more secondary in nature, and are linked to effects previously discussed, including sleep disturbance, health impact, links between academic performance and noise, and impacts in terms of workplace distraction.
- 7.6 There is also a significant financial cost to noise and, in November 2014, DEFRA published *Environmental Noise: Valuing impacts on Sleep Disturbance, annoyance, productivity and quiet*. This estimated the cost alone of the loss of productivity due to noise in England as being between £2 billion and £6 billion per annum in England.
- 8. Noise from Aviation Transport Sources**
- 8.1 The Airports Commission (2013) observes that the metrics used to measure the long-term impact of aircraft noise has become a subject of particular discussion. UK policy has historically identified 57<sub>LAeq16h</sub> as the threshold at which daytime noise marks the onset of significant community annoyance. This was based on the research carried out in 1982 and published in the Aircraft Noise Index Study (ANIS) paper. However, it has been argued that the 57<sub>LAeq16h</sub> contour does not necessarily reflect the day-to-day experience of people living within the contour, who will tend to experience short bursts of intense sound, rather than a constant sound.
- 8.2 Further, it has been noted that significant annoyance may be experienced outside of the 57 <sub>LAeq16h</sub> contour, as acknowledged in the Department of Transport's *Environmental Noise: Valuing impacts on Sleep Disturbance, annoyance, productivity and quiet*. Despite this, in responding to comments on the draft APF the Government decided against using a lower value to mark the onset of significant community annoyance (Airports Commission, 2013).
- 8.3 *Environmental Noise: Valuing impacts on Sleep Disturbance, annoyance, productivity and quiet* also states: 'to limit and, where possible, reduce the number of people in the UK significantly affected by aircraft noise...' The document confirms that 57dB <sub>LAeq,16h</sub> is the 'onset of significant community annoyance'. Therefore even at 60dB there are sections of the community which will suffer significant annoyance.
- 8.4 In 2014 the CAA published CAP1506 - Survey of Noise Attitudes 2014: Aircraft (SoNA). This showed that since ANIS in 1982 the same percentage of people are annoyed by aircraft noise at 54dB <sub>LAeq16h</sub>, suggesting that the 'onset of significant community annoyance' should be lowered from 57dB to 54dB <sub>LAeq16h</sub>.

<sup>23</sup> Road traffic noise and Aircraft Noise exposure and children's Cognition and Health

- 8.5 In 2019 the CAA published CAP1841 . Aircraft Noise and Health Effects: A six-month update (April 2019 . September 2019). This reviews recent research of the impacts of noise and it referenced a Swiss study by Brinks et al, on the exposure-response relationship for road, rail and aircraft noise and ~~as shown below~~. As shown below, it used the metrics of  $L_{DEN}$  and shows that aircraft noise annoyance scores are higher than those given in response to railway and road traffic noise.

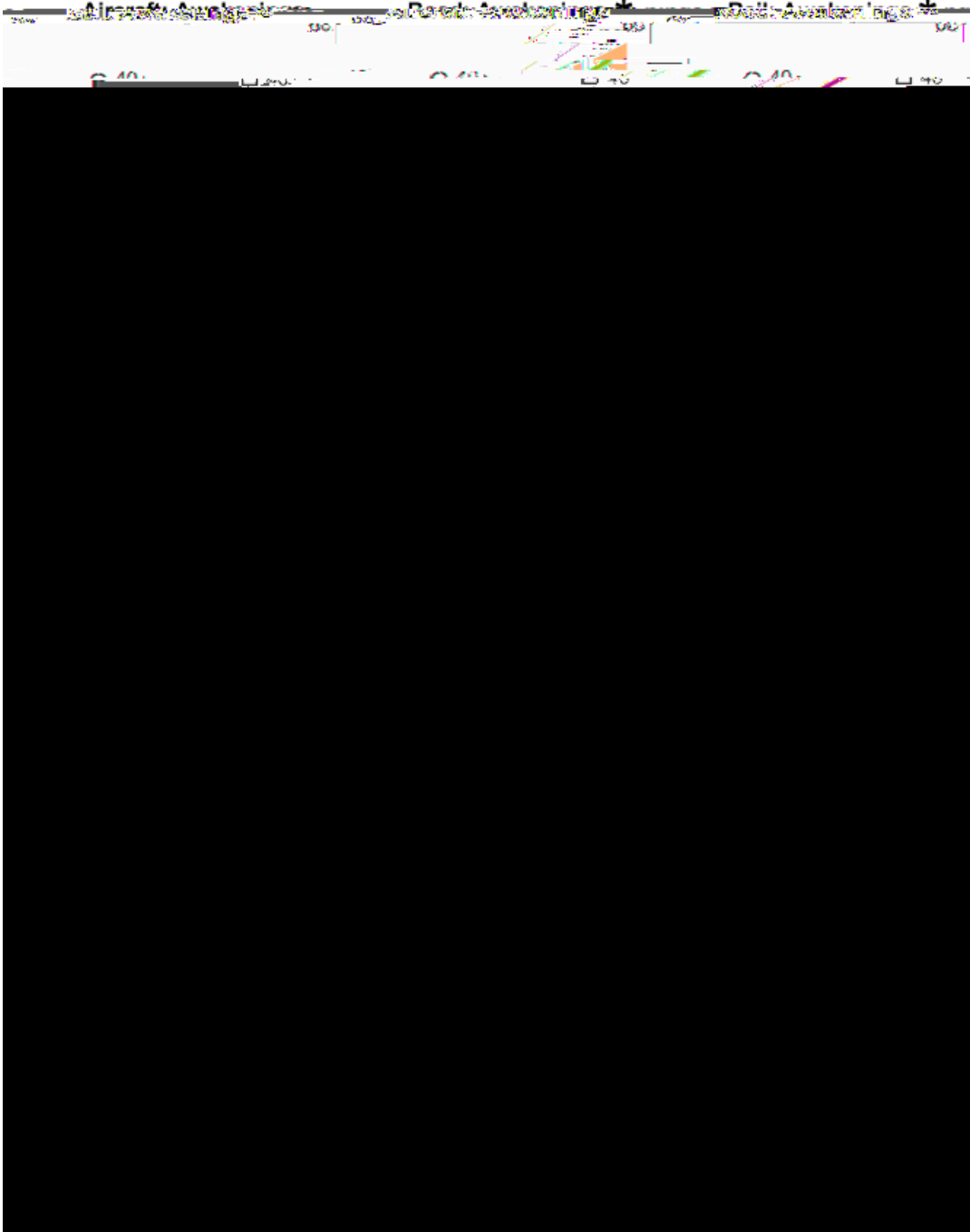


**Source: CAA CAP1841**

- 8.6 The original Planning Policy Guidance 24 (1994) had already recognised that aviation noise required a lower noise standard and ~~• as a 60 Leq dB(A) should be regarded as a desirable upper limit for major new noise-sensitive development.~~ Road and rail were set at higher levels (63dB & 66dB) respectively. The reasoning for having a lower noise level for aircraft noise than fo

- 8.7 As new housing will be in situ for possibly 100 years then reducing the ceiling to exposure to  $60\text{dB}_{\text{LAeq}}$  is the first step in achieving that target. If the current approach to airport expansion is pursued then it is likely that an increase in noise levels are only likely to increase with contours extending further.
- 8.8 The WHO published new Environmental Guidelines for the European Region in 2018, which state that for aircraft noise they strongly recommend reducing levels of noise to below  $45\text{dB L}_{\text{den}}$  or  $40\text{dB L}_{\text{night}}$  as levels above these are associated with adverse health effects. This is a year after the proposals in Airspace change (see 3.12) proposals concurred with the WHO standard of  $45\text{dB L}$

*a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings;  
and/or  
a relatively quiet, protected, external publically accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minute walking distance).*



**Source:**

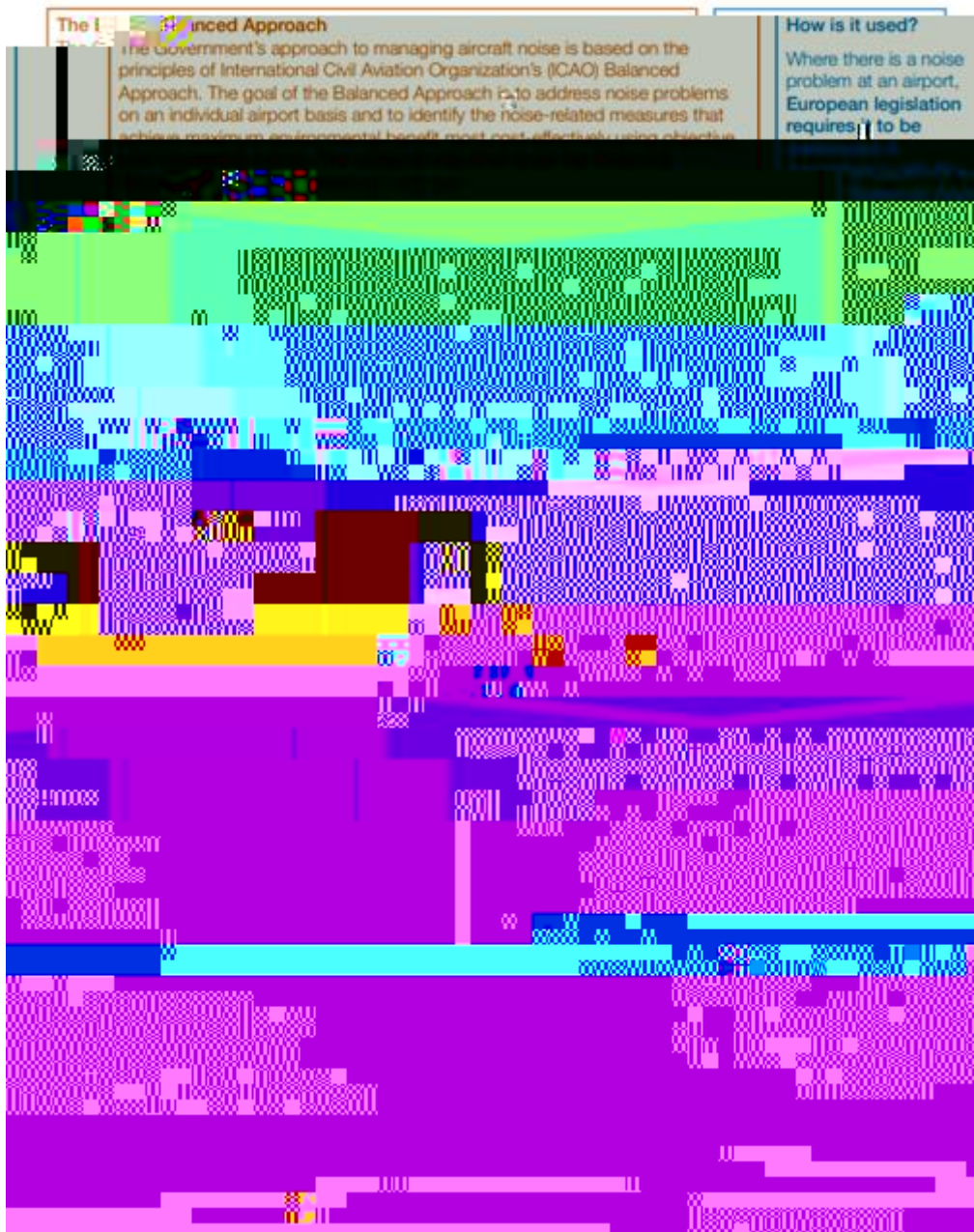


- 8.13 With aviation noise, none of these options are usually available. This is because the noise descends from above and the use of barriers has only limited effect. The only option with residential developments is to restrict the whole development to the 60dB  $L_{Aeq,16hr}$  contour so that residents are not exposed to excessive levels of noise whilst carrying out external activities in their gardens, in the street, at the local shops or waiting for the bus. Neighbourhoods exposed to higher levels of noise may ultimately result in unsustainable.
- 8.14 The Consultation Response on UK Aviation Policy: A framework for balanced decisions on the design and use of airspace, October 2017, set up the policy of LOAEL as 51dB  $L_{Aeq,16h}$  and 45dB  $L_{Aeq,8h}$ . These levels are higher than those proposed by the WHO, and there are many residents around airports that complain about noise outside these contours due to the frequency of overflight.

**9. Government Policy on SOAEL**

- 9.1 There is presently no formal government policy on the SOAEL for new residential development near existing noisy transport sources. All recent publications by the government have focused more on airport expansion and the relative impacts on residents.
- 9.2 The UK Airspace Policy Consultation: *A framework for balanced decisions on the design and use of airspace* was prepared by the Department of Transport and looks to balance the need for increasing airport capacity with the impact there are opportunities within the planning process for compensation for residents and additional controls to protect them. Within this process it is useful to have a clear policy on noise and agreed noise levels for LOAELs & SOAELs so that impact can be clearly quantified economically using the
- 9.3 However, the consultation document only mentions land-use planning in passing. The clearest statement in relation to Land-use Planning is made on page 73 (see extract below) where the document states that the government approach is in line with the principles of International Civil Aviation

***Land-***



**Source: UK Airspace Policy: A framework for balanced decisions on the design and use of airspace**

- 9.4 This is also the approach that the Local Plan has applied in developing its own SOAEL and UAEL table for new noise-sensitive developments. By prohibiting developments nearer Gatwick Airport where noise exposure is greatest, it is therefore minimizing the population affect by any future growth by of the airport.
- 9.5 There have been a number of Public Inquiries and decisions by the Secretary of State in relation to the development of new transport noise sources and expanding existing transport noise sources, including new airport infrastructure. This has included:

*London City Airport Development Plan, 2015-2016; and*

## Topic Paper 7:

10.4 The impacts on health of night flights are well documented and the evidence

Stansted. The analysis showed that above 48dB  $L_{Aeq,8hr}$  there was a significant increase in people being highly sleep disturbed, as summarised in table 14 of that report. The Crawley Borough Local Plan SOAEL for the night period is therefore set on that basis: 48dB  $L_{Aeq,night}$ .

**11** **Secondary Metrics**

- 11.1 The N above metric (Number of events above a specified sound level) is now recognised as a secondary metric that helps to explain how noise is experienced. For night noise the number of events above 60 dB is relevant. The N60 contour relates to a level of over 60dB  $L_{ASmax}$  outside and exposure response, which with the windows open relates to a minimum of 45dB  $L_{ASmax}$

available then planning decisions should be based on operations in complete Westerly or Easterly direction for typical summer day and night for the 16hr  $L_{Aeq}$ , 8hr  $L_{Aeq}$  and N above events. The effect of this is likely to extend the contour area slightly.

**14. Need to Consider Future Noise**

14.1 Aviation noise policy has been centred around the expansion of Heathrow airport with a third runway. With the exception of Inner London, the south west corner of London is arguably the singularly worst location for an Airport in Britain. With a prevailing South-west wind, 70% of all flights descend in a long line over London and in Easterly winds they all depart over South-west London. The total number of people affected by 54dB  $L_{Aeq,16hr}$  or above exceeds the combined totals for all other major international airports in Europe.

14.2 It is with this background that a SOAEL of 63dB  $L_{Aeq,16hr}$  (now reducing down to 60) was adopted by the government for Airport Expansion, as anything less would have stopped Heathrow Expansion. This policy has gained traction with regards expansion but sadly also on occasions for new development.

14.3 Crawley Borough is a relatively small and largely urban settlement based in a wider rural area. It has successfully maintained a healthy gap between Gatwick Airport and residents. When the 2004 White Paper introduced the potential of a wide-spaced Southern Runway at Gatwick Airport, this healthy divide was placed under threat.

14.4 It is still Government Policy to safeguard land for a wide-spaced runway, though Gatwick Airport is currently focussing on the upgrade of its northern runway to full operational standard. Heathrow is looking to build a third runway.

14.5 If the land between the 60-66dB contours is developed and a wide-spaced southern runway is built, then potentially there will thousands of residents affected by levels of noise which, as shown above, will result in sleep loss, an increased risk of heart attacks, myocardial infarctions, strokes, hypertension and high levels of annoyance. This would be reflected in an increase in hospital admission and a significant cost to the NHS and the tax payer, who gained nothing from the initial development.

14.6 This would be exacerbated by the fact that most of the residents when moving into their properties would be unaware of the potential wide-spaced runway and living in relative quiet for years. pothatlaG[an]3(d)13( )-4(l)5(oT/F1 11.04 Tfa95.)10(r