Uttlesford District Council

Planning application UTT/0717/06/FUL
Applicant: BAA plc and Stansted Airport Ltd

Health Impact Assessment

Response on behalf of
Stop Stansted Expansion

9 August 2006

www.stopstanstedexpansion.com
info@stopstanstedexpansion.com

PO Box 311
Takeley
Bishop's Stortford
Herts, CM22 6PY

Tel: 01279 870558

CONTENTS

GLOSSARY

Applicant	BAA
ATM	Air Transport Movement
ATWP	'The Future of Air Transport' White Paper 2003
CO_2	Carbon dioxide
dB	Decibel units used to indicate sound level or changes of sound level
dBA	Decibel units measured on an A-weighted scale (which is designed to more nearly approximate to sounds as perceived by the human ear)
DCC	Development Control Committee
DCLG	Department for Communities and Local Government (formerly ODPM)
DEFRA	Department for Food, the Environment and Rural Affairs
DfT	Department for Transport
EIA	Environmental Impact Assessment
ERM	Environmental Resources Management (BAA's consultants for the HIA)
ES	Environmental Statement
Generation 1	BAA terminology for this planning application
HIA	Health Impact Assessment
HPA	Health Protection Agency
LAeq	As Leq (see below), but using the A-weighted scale (see also dBA)
LAmax	The maximum A-weighted sound pressure level of an aircraft noise event (see also dBA)
Lden	As Leq, but with additional weightings for evening and night time events
Leq	Equivalent sound level of aircraft noise in decibels, often called equivalent continuous sound level – used to depict the total impact of aircraft noise over a period of time
Leq_{16}	An Leq measurement relating to a 16 hour period
mppa	Million passenger movements per annum
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
NPR	Noise Preferential Route
NQP	Night Quota Period (2330 hours – 0600 hours)
ODPM	Office of the Deputy Prime Minister – superseded May 2006 by DCLG
PCT	Primary Care Trust
PM_{10}	Fine particles
$PM_{2.5}$	Ultra-fine particles
PPG	Planning Policy Guidance Note – relating to Government planning policy
PPS	Planning Policy Statement – term given to more recent versions of above
RCEP	Royal Commission on Environmental Pollution
RSS	Regional Spatial Strategy
SA	Sustainability Appraisal
SHA	Strategic Health Authority
SSE	Stop Stansted Expansion
STAL	Stansted Airport Limited, a wholly owned subsidiary of BAA
UDC	Uttlesford District Council
WHO	World Health Organisation

Sources & references: In the course of this response document, referencing of specific source material is provided either directly in the main body of the text or by the use of footnotes. In addition, a general reference list is provided at the end of this response document.

1 INTRODUCTION

1.1 Context of the Health Impact Assessment

1.1.1 On 26 April 2006 Stansted Airport Ltd ('STAL') and BAA plc (hereinafter referred to as 'BAA' or 'the Applicant') submitted a planning application to Uttlesford District Council ('UDC') which, if approved, would allow substantial expansion of Stansted Airport.

1.1.2 Activity at the airport is currently constrained by an annual limit of 241,000 air transport movements ('ATMs') and a throughput of 25 million passengers per annum ('25mppa'). In 2005 Stansted handled 178,000 ATMs and 22 million passengers. BAA seeks an increase in allowed ATMs to 264,000 and the removal of the limit on passenger numbers.

1.1.3 The proposed increase in the scale of operations at Stansted amounts to a 48% increase in ATMs compared to 2005 and, if the present ceiling on passenger throughput of 25mppa were to be removed, as requested by BAA, Stansted would eventually be capable of handling 50mppa which would give rise to a doubling of airport-related road traffic. Taken together, the increase in ATMs and in airport-related road traffic would have significant health impacts on the local community, particularly in relation to noise, air quality and social capital.

1.1.4 BAA appointed consultants, Environmental Resources Management ('ERM'), to prepare a Health Impact Assessment ('HIA') relating to the proposed development and BAA submitted the resultant ERM report to UDC on 6 June 2006. The ERM report is well presented but contains numerous fundamental limitations and flaws. The narrow terms of reference were presumably defined by BAA. However, we are unimpressed by ERM's unquestioning acceptance of BAA's narrow terms of reference and of unreliable BAA input data and by ERM's evident enthusiasm to please its client, which is a consistent theme featuring throughout this HIA.

1.1.5 This response to the Applicant's HIA has been prepared by Stop Stansted Expansion ('SSE') and should be considered in conjunction with all of the other documents submitted by the Applicant in support of his planning application, in particular the Applicant's Environment Statement (ES), and also in conjunction with SSE's main response (14 July 2006, Volumes 1 and 2) to the application.

1.1.6 In preparing this response, we have not only carefully studied the HIA report from ERM and the Applicant's Environmental Statement ('ES') but have also had the benefit of discussing the impact of aviation on community health with Ministers and senior officials at the Department of Health over the past three years. The Chief Medical Officer, Sir Liam Donaldson, has also been helpful in responding on particular issues of concern. In addition, we met twice with Dr Paul Watson, Medical Director of the Essex Strategic Health Authority ('SHA') and have also discussed the above matters with the Uttlesford Primary Care Trust ('PCT').

2 INHERENT SHORTCOMINGS IN THE HEALTH IMPACT ASSESSMENT

2.1 The HIA relies upon input data derived from the ES

2.1.1 The HIA is based on the assumption that removal of the 25mppa ceiling would result in Stansted's passenger throughput rising to 35mppa or at most 40mppa. However, as we demonstrate in our main response, the actual throughput could easily rise to 45mppa by 2021 and to 50mppa by 2030. This would involve larger aircraft and a far larger increase in airport-related road traffic than has been allowed for in the HIA, both of which factors have significant impacts upon local air quality, aircraft noise and ground noise.

2.1.2 As we have shown in Volume 1 of our main response to this planning application, BAA's assessment of the environmental impacts is inadequate and unreliable. The impacts of the proposed development in such areas as aircraft noise, ground noise, air quality and surface access have been systematically understated and all of these are of fundamental importance in assessing the health impacts.

2.1.3 Also, as shown in Volume 1 of our main response, there are no local or regional net employment benefits arising from the proposed development and even on a national basis it is doubtful that net employment benefits would arise.[1] This is largely because of displacement employment impacts (disregarded in BAA's ES but addressed in Volume 1: Section 8 of our main response) and also because of BAA's oversimplistic employment analysis which focuses on quantitative but not qualitative employment issues. A recent report by Professor John Whitelegg in connection with Bristol Airport[2] lends strong support to our contention that the employment benefits suggested by BAA are illusory. Furthermore, the HIA relies upon such illusory employment benefits as a basis for justifying the many adverse health impacts of the proposed development.

2.1.4 Instead of using the actual 2005 baseline or even a projected baseline for when Stansted reaches 25mppa – currently projected by BAA for 2008/9 – BAA has constructed a hypothetical baseline for 2014 derived from exploiting its current planning consent for 241,000 ATMs and 25mppa to the maximum limit wherever possible. BAA has then presented projections for 264,000 ATMs which are calculated in such a way as to understate the environmental impacts, thus creating the narrowest possible gap between what would happen if its planning application were approved and what would happen if it were not approved. The HIA focuses upon the incremental impacts arising from this narrow hypothetical gap.

2.1.5 Many of the assumptions and assertions used by BAA in arriving at the projected environmental impacts are highly dubious and some are even based on erroneous data. Numerous examples of this are highlighted in SSE's main response and will not be repeated here. However, the key point is that the input data upon which the HIA relies is fundamentally flawed and therefore the HIA itself is fundamentally flawed.

[1] There may be net employment benefits at an EU-level taking account of airport jobs that are likely to be filled (if present trends continue) by migrant workers from Central and Eastern Europe.
[2] 'The Economic Impact of Bristol International Airport; a report for the Parish Councils Airport Association', Professor John Whitelegg BA PhD FCIT FILT FRSA, Eco-Logica Ltd., Lancaster, Oct 2005.

2.2 Failure to take account of cumulative impacts

2.2.1 In view of the unequivocal commitment of BAA to submitting an application for a second runway at Stansted in the near future, it is difficult to comprehend how this HIA can be considered in isolation. Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) Regulations, 1999 requires an assessment of the development's

> *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, the use of natural resources and the emission of pollutants, the creation of nuisances and the elimination of waste.*

Both the EIA and the HIA fail to satisfy the above requirement.

2.2.2 The HIA fails to take account of other major developments that are planned for the Stansted-M11 sub-region over the period to 2021 in the Draft East of England Plan. Arguably, this is largely a failing of the ES, which failed to consider these matters, rather than a failing of the HIA itself.

2.2.3 The HIA also fails to take account of cumulative impacts *over time.* The impact of the airport upon the education of children in local schools is a good example of this. The results of the RANCH study[3] show a reading age delay of two months for each additional 5dBA of noise above 40dBA Leq and, if the application were to be approved, schools in the vicinity of Stansted would experience an additional 2-3dBA Leq. This would result in a reading age delay of about one month – over and above the several months reading age delay in the affected schools which already results from Stansted Airport's operations. However, the current/historic loss is disregarded; only the increment is considered and is viewed as a negligible impact, partly because it is only a small increase on the status quo.[4]

2.2.4 Similarly, in terms of life expectancy, a calculation is carried out in the HIA, for example, in relation to concentrations of $PM_{2.5}$ and this concludes (HIA: para 6.2.7) that the impact upon the exposed population of 51,586 would be a total of 49 years (on average 8.3 hours per person). In fact this calculation is made purely in relation to incremental $PM_{2.5.}$ The current/historic impact – an average of about three days loss in life expectancy per local resident – is disregarded and only the increment is considered in order that it may be described as negligible in proportion.

2.3 Exclusion of other key health impacts

2.3.1 Surprisingly and disappointingly the HIA explicitly excludes (para 1.5.1) any consideration of climate change impacts upon human health and consideration of the impact of a potential 43% increase in night flights. Also explicitly excluded from the HIA are the implications for the health service infrastructure serving the community and emergency planning implications. These exclusions further devalue the Applicant's HIA. We address these exclusions in more detail in Sections 5 and 6 of our response, below.

[3] 'Aircraft and road traffic noise and children's cognition and health: a cross national study', Stansfield et al, *The Lancet*, Jun 2005.
[4] The comparison in the HIA of levels of educational attainment in the affected schools vs national averages is not evidence of the airport having no impact. Significantly higher levels of attainment may have been achieved if it were not for interruptions from aircraft noise. Indeed, that is what the scientific evidence (e.g. the RANCH, Munich and West London studies) clearly suggests.

2.4 Consultation process

2.4.1 The HIA states

> *A very important part of HIA is the gathering of the views and experiences of those people who may be affected by the proposed development or who have an interest in it.* (para 1.7)

and then goes on to admit that no workshops were held for the general public and to claim that this was due to a lack of public interest.

> *Two workshops aimed at engaging the general public had to be cancelled because of insufficient public interest.* (para 4.5.10)

2.4.2 The truth of the matter is that very limited publicity and unreasonably short notice was given for these public workshops. Amongst the local press, for example, there was negligible publicity; only one newspaper carried a note of the workshop for the general public with just one day's notice and which required individuals to email expressions of interest to participate. Meanwhile, for Parish Council workshops, only four working days notice was given for workshops during the holiday season, such that local community representatives complained variously to ERM, BAA, the SHA, UDC and to local MP Sir Alan Haselhurst about what appeared to be an attempt to pay lip service to public consultation. It was certainly not a lack of interest on the part of the local community; it was a lack of genuine commitment to public consultation and/or a lack of professionalism on the part of ERM in its failure to communicate properly the opportunity for public participation.

2.5 Lack of independence

2.5.1 The health and wellbeing of the community is of such paramount importance – and the potential adverse health impacts of airport-related and aircraft noise and emissions so well established – that it would be negligent for any local planning authority to rely solely on an HIA which has been arranged and paid for by a developer who, inevitably, has a vested interest in ensuring that the HIA does not highlight issues which could threaten approval of his plans.

2.5.2 Although ERM has had the benefit of external support and guidance in preparing its report, there is nevertheless a conflict of interest as the HIA was not conducted independently but by consultants acting on behalf of and paid for by the Applicant.

2.5.3 This conflict of interest is accentuated by the fact that ERM has wider business interests with BAA, for example, ERM is engaged to carry out an annual review of the environmental performance of all BAA's UK airports, including Stansted.

2.5.4 The deployment of an expert steering panel associated with production of the report does little to dispel the taint. Acceptance of BAA input data and terms of reference suggests that the steering panel conducted little more than a rubber-stamping exercise rather than playing an active, scrutinising role.

2.5.5 Nor can we avoid also expressing disappointment with the lack of vigilance on the part of the Essex SHA in relation to the HIA. We recognise that the SHA's role was limited in scope but its acceptance of the Applicant's own input data, narrow terms of reference and use of a consultant who has close business ties with the Applicant do not imply a high degree of scrutiny on the part of the SHA. The latter's role should have been to ensure that the HIA process was sufficiently robust and comprehensive to command public confidence. Indeed, in writing to

SSE on 24 March 2006, the Medical Director emphasised the 'need to ensure that the HIA is carried out using rigorous scientific technique and recommendations are evidence based'.[5] As our response shows, these worthy objectives were not achieved.

2.5.6 We understand that ERM allowed BAA editorial input into the final HIA report but, even disregarding this, it is evident from the way that ERM has carried out the HIA that it falls far short of the standards of objectivity and academic rigour that could have been expected from independent assessment. For example, BAA input data has been unquestioningly accepted and this has contributed to a report which is unreliable.

2.5.7 BAA's response to the HIA describes the exercise as 'independent' and emphasises the HIA's two main recommendations

> *BAA should investigate further ways it can provide relevant information to those communities that are most anxious about the impacts of the airport's activities.*
>
> *BAA should seek to maximise health benefits from the additional employment opportunities generated by the proposed development*

The above stands out as a particularly egregious example of corporate cynicism, ignoring an additional 80,000 flights a year, an additional five million tonnes of carbon dioxide a year emitted into the atmosphere, a doubling of road and rail traffic, a 40% increase in emissions which may be carcinogenic, an increase of 43% in sleep-disturbing night flights, admitted adverse health and educational impacts upon local school children, admitted reductions in life expectancy for the local population and increased stress and anxiety in local communities coupled with a reduction in social capital and cohesion. It is simply impossible to reconcile the reality with this self-serving HIA that has been submitted by BAA.

[5] Dr Paul Watson, Medical Director, Essex SHA. letter to SSE, 24 March 2006.

3 IMPORTANCE OF THE HEALTH IMPACT ASSESSMENT

3.1 WHO Charter on Transport, the Environment and Health

3.1.1 The HIA contains only one passing mention (in Annex A5) of the WHO Charter on Transport, Environment and Health which was formally adopted by the UK in 1999. The WHO Charter is highly relevant to major planning applications of this type. It sets targets for measures to reduce environmental pollution, accidents and noise associated with transport and states

> *We must ensure that the wellbeing of communities is put first when preparing and making decisions regarding transport and infrastructure policies.* (WHO Charter, Preamble, Article 2)

The WHO Charter places emphasis on public transport and sets out the principles, together with a plan of action, for transport policies that are consistent with sustainable development.

3.1.2 The following points are stressed in the WHO Charter:

- there should be more co-ordination between policies on transport, environment and health
- there should be better public information about the adverse environmental and health impacts of transport
- vulnerable groups are disproportionately affected by transport pollution, particularly children, the elderly, the disabled and the socially excluded
- the cumulative effect of air pollution and noise on public health should be considered

3.1.3 The WHO Charter states that, by 2004 at the latest, Member States must define national quantitative or (if this is technically not feasible) qualitative health targets. This is of particular importance since it highlights the need for

- targets for residential areas, schools and hospitals where noise should be reduced (including noise from airports and highways)
- reduction in night time noise in residential areas – and this noise should be within WHO recommended night time values
- protecting existing quiet parkland and conservation areas.

3.1.4 The WHO 'Guidelines for Community Noise', which implicitly form part of the WHO Charter, are referred to at various points in the HIA but, apart from a consideration of the effect of noise on school children, few of its recommendations have been given the attention they deserve. The WHO Guidelines are attached at Appendix 1 to this response.

3.2 Government policy context

3.2.1 Although there is a statutory obligation to carry out an EIA for major developments such as airports, an HIA is not a statutory obligation. However, it is often difficult, or indeed impossible, to separate health from environmental issues and it is considered a mark of good practice to carry out an HIA. Moreover, the Air Transport White Paper ('ATWP') called for airport developers to undertake HIAs in relation to their airport expansion proposals:

> *Airport operators will have to meet the requirements for environmental impact assessment, and will also be expected to undertake appropriate health impact assessments*.[6]
>
> *The public health impacts of aviation are a matter which the Government takes very seriously. As noted earlier, we must ensure air quality standards around airports are met. Research continues on the effects of noise on human health, and the Government will take account of existing guidelines from the World Health Organisation. We are also supporting research to obtain better evidence on this and, through the European Commission, on whether, for example, aircraft noise exposure in schools can interfere with children's cognitive performance.*[7]

3.2.2 HIAs may be regarded as part of the Government's commitment to the WHO Charter which states that the health implications of major infrastructure projects should be assessed through an HIA as part of the process. The importance of HIAs has also been widely endorsed by the Government in a wide range of national policy statements such as the 1998 Transport White Paper ('A New Deal for Transport: Better for Everyone'), the 1999 Health White Paper ('Saving Lives: Our Healthier Nation', HMSO 1999) and the 2004 Health White Paper ('Choosing Health - Making Healthy Choices Easier'). HIAs are also a major recommendation of the Acheson Report on Inequalities in Health (Acheson, 1998).

3.2.3 HIAs are also recognised in the 1997 Treaty of Amsterdam calling for EU Member States to examine the possible impact of major policies on health. Importantly, the Treaty of Amsterdam amended the EC Treaty (Treaty of Rome) with new Article 152 (ex Article 129) of the EC Treaty given wider scope than before. The new Article now embraces all causes of danger to human health as well as the general objective of improving health and calls for measures aimed at ensuring (rather than merely contributing to) a high level of human health protection.

3.2.4 HIAs should therefore be in the forefront of the public policy agenda and, in relation to this particular planning application, before planning consent could be contemplated, the decision-makers would need to be in possession of a thorough, objective and reliable (i.e. independent) assessment of the health impacts which demonstrated that the proposed development would not compromise the need to ensure a high level of human health protection.

3.3 Conduct and timing of the Health Impact Assessment

3.3.1 The NHS Health Development Agency's report (2002) 'Introducing health impact assessment: informing the decision-making process' states

> *Experience shows that even an otherwise well carried out HIA... will have limited value if the recommendations arrive after key decisions have already been taken*.

3.3.2 However, the 'key decision' in this case is the Government's policy support for maximum use of the existing runway, as announced in the ATWP in December 2003. Yet the first HIA in relation to proposals for expanding Stansted to maximum use of the existing runway is this current HIA carried out by ERM and this was not made available until June 2006. It is therefore implicit that the Government's policy support for maximum use of the existing Stansted runway is

[6] ATWP, para 12.2, p139.
[7] Ibid, para 3.32, p38.

conditional upon (inter alia) the proposed expansion not compromising the need to ensure a high level of human health protection.

3.3.3 ERM has failed to pay due regard to many of the most important principles set down in the WHO Charter and other overarching policy documents relating to the scope and conduct of an HIA. In addition, a comparison with our own reference list (appended to this response) highlights significant omissions from the ERM literature review. For example, in relation to the understanding of noise impacts and the health effects thereof, there is no mention of the highly regarded work carried out in relation to San Francisco and Sydney airports. A second example is in relation to air quality, where the important study by Peters & Pope (2002) and the projected PM_{10} exceedances under EU Air Quality Directive 1999/30/EC are not even not mentioned; and a third example is in relation to the general conduct of an HIA where there is no mention of key policy guidance statements from the Department of Health and other authoritative sources.

3.3.4 Commercial interests should not be permitted to override health considerations and, in our view, this issue is of such fundamental importance that UDC should commission an independent assessment of the health impacts of the proposed development so as to obtain an objective assessment of the impacts – including cumulative impacts – of the proposed development upon the health of the local community. BAA should be invited to meet the cost of the independent HIA.

4 MATTERS NOT CONSIDERED IN THE HEALTH IMPACT ASSESSMENT

4.1 Limited scope of the Health Impact Assessment

The scope of the HIA is set down in para 1.5.1 of the ERM report and we note that the following extremely important factors are listed as being excluded (in the order in which they are listed):

4.1.1 **Proposal for a second runway:** no explanation is given as to why this is excluded and since BAA is committed to submitting a planning application in 2007 for the construction of a second runway, it is difficult to see how the health impacts of expansion on the existing runway can be considered in isolation. This amounts to expansion by stealth – drip feeding – so as to minimise the increments – and thereby the environmental and health impacts at each stage, and it is contrary to the requirement under Schedule 4 of the Town & Country Planning (Environmental Impact Assessment) Regulations, 1999 (see para 2.2.1 above).

4.1.2 **Expansion associated with the M11 corridor development, as described in the Regional Spatial Strategy for Eastern England (RSS14):** the proposed expansion to maximum use of the existing runway must be considered in the context of the wider development planned for the Stansted-M11 sub region. It cannot and should not be considered in isolation. The provision of health care needs to recognise the cumulative effects of all planned development.

4.1.3 **Health service infrastructure planning for population expansion around the Airport:** the reason given for this exclusion is that this matter is being considered by the West Essex Clinical Services Review. However, here again the health effects of airport expansion are cumulative. It would have been helpful to have had the views of the West Essex Clinical Services Review, even in the form of an interim report.

4.1.4 **Implications for emergency plans – these will be addressed through existing emergency planning processes:** it is not clear what falls within the scope of 'emergency plans': Does this point relate to road traffic accidents or aircraft accidents? This, together with the comments listed for the above two points, is indicative of a fragmented rather than a holistic approach to the HIA.

4.1.5 **Effects of climate change on human health:** no explanation is given for excluding climate change impacts from the HIA and this cannot be justified since climate change will have major consequences for human health. As pointed out in SSE's main response (Volume 1: para 2.2.7) only 4 pages out of BAA's 2,000 page planning application relate to climate change despite this issue being widely acknowledged as the biggest threat currently faced by mankind and despite the fact that aviation is the fastest growing contributor to climate change. Ignoring the impacts of climate change in the HIA is indicative of BAA's cavalier approach to this issue. It is as if BAA is in denial about the effects of the additional carbon dioxide (quite apart from other emissions) that would result if its planning application were to be approved - the equivalent of five million tonnes a year.

4.1.6 **Health effects of night flights during the quota period:** the HIA attempts to justify this omission on the grounds that the number of permitted night flights is set by the DfT and that the proposed development does not seek to alter the current

DfT quota. We regard this as an illogical, untenable and cynical attempt to avoid taking account of health effects of a potential 43% increase[8] in night flights. It is of course true that such an increase could take place even if the planning application were not approved but (a) if additional ATMs were to be permitted, there would be greater scope for BAA to accommodate more night flights and (b) cumulative health impacts require to be considered, whether or not these are directly contingent upon the planning approval that is sought. We address the issue of night flights further in para 6.3.1 below.

4.2 Benefits

4.2.1 In somewhat stark contrast to the above list of serious exclusions set out in para 1.5.1 of the HIA which tell us that a number of major health impacts are simply to be ignored, para 1.5.4 of the HIA lamely suggests that 'access to air services could facilitate improved social networks through visits to distant friends and relatives'. This conjures up an image of attempting to balance a mouse and an elephant on opposite sides of a set of scales and it is hardly even a valid point. If history is anything to go by, the proposed development would encourage more UK residents to relocate to homes in France and Spain, thus *creating* distant relatives whilst at the same time encouraging additional migrant workers from Central and Eastern Europe, with the same effect. The effect of proposed developments on social capital is discussed below, in Section 8 of our response.

[8] to 12,000 per annum compared to 8,370 in year ended 25 March 2006.

5 CLIMATE CHANGE

5.1 Background

5.1.1 Climate change is an issue where the health and environmental impacts are virtually inseparable and go far beyond the immediate vicinity of Stansted Airport. If the planning application were to be approved, the equivalent of an additional five million tonnes of carbon dioxide ('CO_2') would be produced annually by the airport's operations. To put this into context, the most recent estimate of carbon emissions for the whole of the East of England Region from domestic, transport and industrial/commercial sources (including power generation) is 50m tonnes of CO_2 (13.6m tonnes of carbon).[9]

5.1.2 Climate change is the result of greenhouse gas accumulation in the atmosphere, arising from the combustion of fossil fuels. Quoting from the Royal Commission on Environmental Pollution ('RCEP')

> *Although much is being done to reduce emission of climate change gases from industrial and domestic sources, aircraft emissions are lagging far behind. Because of radiated forcing, the impact of emissions from jet aircraft is almost three times that from land-based sources. This, coupled with the growing demand for air transport and the reductions in carbon dioxide emissions from other sources, means that, unless steps are now taken to curtail demand, aviation will soon become the major factor driving climate change.*[10]

5.1.3 The RCEP also pointed out, in its 2002 report 'The Environmental Effects of Civil Aircraft in Flight', that

> *short haul passenger flights make a disproportionately large contribution to the global impacts of air transport. These impacts are very much larger than those from rail transport over the same point-to-point journey.*

Such short haul passenger flights constitute the overwhelming majority of flights to and from Stansted Airport. The RCEP report also states that expansion of air freight movements must be examined with particular care since it is much more environmentally damaging than other transport modes. For these reasons, the RCEP report recommends restricting airport development.

5.2 Climate change and health

5.2.1 There have been numerous important reports on the health effects of climate change. These include the WHO Report on Climate Change and Human Health (1996), the Department of Health report on the same subject (2001) and a report from the Parliamentary Office of Science and Technology on the UK Health Impacts of Climate Change (2004).

5.2.2 The scientific and medical press continues to publish important and peer-reviewed articles on this subject, for example, two recent papers published in The Lancet – on 11 March and 24 June 2006. The first of these was by authors from Australia and New Zealand (McMichael, Woodroff & Hales 2006) and the second from

[9] DEFRA Regional Indicators, East of England, Dec 2005 shows 13.6m tonnes. Note: 1 tonne of carbon = 3.67 tonnes of CO_2. http://www.sustainable-development.gov.uk/regional/excel/consumption-production.xls

[10] Secretary of the RCEP, personal correspondence, 1 August 2003.

London in the form of a Seminar in Public Health Medicine (Haines et al. 2006). Both stress a wide spectrum of adverse effects on human health.

5.2.3 The health impacts of climate change are significant and wide ranging. They include impacts arising from extremes of temperature, flooding, UV exposure as well as vector borne and water borne diseases, food poisoning, storms and air pollution. These are discussed in more detail below.

5.2.4 Increased temperatures will bring about a marked increase in food poisoning and outbreaks of diarrhoeal disease. About 100,000 cases of food poisoning occur annually in the UK and it has been estimated that there will be a 10% increase each year according to the Department of Health's 2001 report.[11]

5.2.5 Increased temperatures will also facilitate the introduction and spread of vector borne infectious diseases in the UK. Malaria is the most important of these and most sensitive to long term climate change. Spread is unlikely to occur to any large extent in the UK in the immediate future although infection is likely to occur more frequently in countries bordering on endemic areas. This could include parts of southern Europe. It must be remembered that malaria was still endemic in certain parts of Europe until shortly after the Second World War. Nevertheless, the 2001 Department of Health report referred to above warned that local outbreaks might occur in the UK.

5.2.6 Climate change is already considered to be responsible for the increase in another vector borne infection, tick born encephalitis, in Sweden and the introduction and spread of West Nile infection has resulted in a considerable number of recent cases of encephalitis in the USA. Dengue is the most widespread vector borne infection worldwide but temperate climates have so far been spared.

5.2.7 As evidence that these potential new health threats to the UK are now being taken very seriously, it is worth noting that the Health Protection Agency is already carrying out surveillance on West Nile infection in England and Wales. And it is somewhat ironic to note that not only is aviation the fastest growing contributor to the climate change which is giving rise to these new health threats to the UK (and elsewhere) but also it is the rapid expansion of air travel which has the potential to introduce infectious diseases into the community which can then spread rapidly nationwide (e.g. the threat of Avian influenza).

5.2.8 Hotter summers with more frequent and more prolonged heatwaves will result in increased mortality, particularly amongst the elderly and amongst those with pre-existing disease, especially cardiovascular and respiratory disease. The most important recent example is the August 2003 heatwave in Europe which resulted in 35,000 deaths, almost 14,800 of these in France and an estimated 2,000 deaths in the UK.[12]

5.2.9 Of course, none of the above points is addressed in the HIA because the whole issue of climate change is conveniently ignored.

[11] 'Health Effects of Climate Change in the UK', Department of Health, 2001.
[12] Earth Policy Institute ('EPI'), Washington, published in New Scientist, October 2003.

5.3 Policy context

5.3.1 The Department for the Environment, Food and Rural Affairs ('DEFRA') has made it clear that local authorities should take steps to mitigate the effects of climate change. For example, as stated by the Environment Minister in January 2006:

> *Action at a local and regional level is essential in mitigating and adapting to climate change, and it is here that the planning system can play a particularly important role.* ('Planning for Climate Change Conference', 26 Jan 2006)

5.3.2 The Chief Medical Officer, in a letter to SSE (2 May 2006) on the subject of climate change, stated

> *You also make a broader point about the way local bodies are approaching the issue of how best to incorporate the health and environmental dimensions of the airport expansion into their deliberations. Essentially this is a matter for the local planning authority. ...It is vital that whatever structures and processes are established to underpin the planning decisions, they command public confidence.*

It would be fair to say that an HIA which has been organised and paid for by the developer, and where the consultants selected to carry out the HIA have wider business interests with the developer, is not the sort of approach which is likely to command public confidence. However, an independent HIA, professionally and objectively carried out would be likely to command public confidence.

5.3.3 Despite the magnitude of the climate change issue it is clear that the Applicant does not wish the climate change implications of the expansion of aviation to be considered in relation to this planning application. However, the issue cannot be avoided; every local planning authority has a statutory duty 'to exercise its function with the objective of contributing towards the achievement of sustainable development'[13] and PPS23 advises that

> *... any consideration of the quality of land, air or water and potential impacts arising from development, possibly leading to impacts on health, is capable of being a material planning consideration, in so far as it arises or may arise from or may affect any land use.* (PPS23, para 2)

5.3.4 More specifically, Appendix A of PPS23 states

> *The following matters (not in any order of importance) should be considered in the preparation of development plan documents and may also be material in the consideration of individual planning applications where pollution considerations arise:*
>
> - ***the possible impact of potentially polluting development (both direct and indirect) on land use, including effects on health, the natural environment or general amenity...***
> - ***the need to limit and where possible reduce greenhouse gas emissions and take account of potential effects of climate change.*** [our emphasis]

5.3.5 PPS23 also states that the precautionary principle should be invoked when:

- *there is good reason to believe that harmful effects may occur to human, animal or plant health, or to the environment; and*

[13] Planning & Compulsory Purchase Act, 2004, Section 39(2).

- *the level of scientific uncertainty about the consequences or likelihood of the risk is such that best available scientific advice cannot assess the risk with sufficient confidence to inform decision-making.*

... Precautionary action requires assessment of the costs and benefits of action, and transparency in decision-making. (PPS23, para 2)

We are aware of – and disagree with – the stance taken by Essex SHA to the effect that the impact of increased carbon dioxide emissions arising from the proposed development on the health of local inhabitants would be 'minute' and could therefore be disregarded for the purposes of this HIA. In discussing this matter with the Medical Director of Essex SHA[14] we obtained the clear impression that the key consideration in reaching this view was a desire to avoid becoming embroiled in arguments with Central Government on a controversial policy issue.

5.4 Levett-Therivel report

5.4.1 Volume 2 of SSE's response to the planning application includes a report by Levett-Therivel, Sustainability Consultants, on climate change. Amongst the conclusions of this report are:

- *Government policy is inconsistent: it wants more air travel and fewer greenhouse gas emissions*
- *The Tyndall Centre's arithmetic shows that projected growth in air traffic can't be squared with climate targets; the growth is too big, and technical fixes are too small and slow*
- *It is unreasonable and impracticable to expect housing, industry, surface transport to make even bigger than 60% reductions to enable aviation to continue to grow*
- *Stansted is not the only airport responsible for this. But since, under Aviation White Paper, all airports are growing too, Stansted would add to net growth. It would cause cumulative impacts*
- *The Generation 1 ES does not consider any real alternatives such as the obvious one of less flying*
- *Stansted's only proposed response is supporting inclusion of air travel in an international emissions trading scheme. This is a wholly inadequate response to an environmental issues of such magnitude*
- *Despite a manipulative consultation process which systematically discouraged mention of climate change, public responses still showed a very high level of concern about it*

5.4.2 The above extracts from the Levett-Therivel report amount to a hard-hitting list of criticisms and, given the high standing of Levett-Therivel as consultants specialising in the issue of sustainable development, these criticisms need to be taken seriously. And as previously stated, climate change is an issue where the environmental impacts and the health impacts are virtually inseparable.

5.5 Concluding remarks on climate change

5.5.1 In conclusion, in relation to the question of whether climate change health impacts should be considered in the HIA, we believe that in view of (i) the seriousness of the issue; (ii) the scale of impacts arising from the proposed development; (iii) the planning guidance set down in PPS23 and (iv) the overarching duty of a local

[14] Most recently on 24 March 2006 at a meeting between Dr Paul Watson, Medical Director Essex SHA, and SSE.

planning authority to consider the impacts of a proposed development upon community health, UDC has no choice but to insist that climate change impacts are made fully transparent and formally assessed as part of the HIA.

6 NOISE

6.1 Noise measurement

6.1.1 The limitations in the methods used by the DfT and BAA to depict aircraft noise are discussed in Volume 1 of SSE's response to the planning application and will not be repeated here. There is no single satisfactory measure by which noise (unwanted sound) can be assessed. A combination of measurements is needed in order to obtain a reasonable depiction and understanding of noise impacts both from aircraft and, for those living in the vicinity of airports, from surface noise from rail and road traffic. It is important to consider these impacts holistically (i.e. in aggregate) and then express the impacts in terms which are meaningful, for example, frequency and scale of noise events, as well as averages calculated over shorter time periods as well as longer time periods.

6.1.2 The DfT recommends the use of a 57dBA Leq_{16} noise contour to define the onset of significant community annoyance. This is based on the Aircraft Noise Index Study (ANIS) published over 20 years ago.[15] The Leq_{16} metric itself is flawed in that it, in effect, averages noise levels over a 16 hour day, failing to reflect the varying effects of frequency of flights, type of aircraft, peak intensity or changes in take off and landing direction/patterns (in particular, the 'modal split'). However, even on the basis of a 57dBA Leq_{16} threshold, the proposed development would be at odds with the Government's policy.

6.1.3 Government policy as set down in the ATWP is that

> *Local controls should operate within these principles to manage the environmental impact of aviation and airport development so that ...*
> *- noise impacts are limited, and where possible reduced over time.*[16]

The use of the phrase *'where possible'* rather than, for example *'where practicable'* is significant. Clearly it is entirely possible to limit the noise impacts at Stansted – and thereby the resultant adverse health impacts – by continuing to limit the number of ATMs to 241,000 and also by introducing local controls to insist on only the quietest aircraft. In fact, the ATWP provides policy support for precisely this approach:

> *A wide-ranging and balanced approach will be needed to deliver these objectives, including:*
> *- encouraging airport operators, airlines and air traffic managers to adopt the cleanest and quietest operational practices*
> *- the withdrawal of the noisiest and dirtiest aircraft, and replacing them with aircraft capable of better environmental performance...*[17]

6.1.4 It is also relevant to note the Environmental Noise Directive 2002/49/EC which reaffirms that

> *It is part of Community policy to achieve a high level of health and environmental protection, and one of the objectives to be pursued is protection against noise.*[18]

[15] Brooker et al, 1985.
[16] ATWP, para 3.6, p30.
[17] Ibid, para 3.7, p30.
[18] Directive 2002/49/EC of 25 June 2002 relating to the assessment and management of environmental noise, Preamble, para 1.

6.1.5 A recent paper published in the *Proceedings of the Institute of Acoustics* reviewed the methodology employed for the 20-year old ANIS and made a number of criticisms, making it clear that the 57dBA Leq noise contour was flawed as an indicator of community annoyance. Roy Vandermeer QC, in his Terminal Five Inspector's Report for Heathrow, commented in similar terms on the inadequacy of the Leq system, stating

> *As I have already pointed out this suffers from a number of deficiencies which, in my judgement, limit its value as a true and complete reflection of the impact of aircraft noise on those living around Heathrow.*[19]

6.1.6 The HIA's reliance on BAA input data based on the 57dBA Leq air noise threshold alone is an inadequate basis for a proper health assessment of the noise impacts upon the local community. For example, the EA's assessment of noise impacts fails to take account of the cumulative effect of aircraft noise, ground noise and road traffic noise arising from the development and this is contrary to Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) Regulations, 1999.

6.1.7 The inadequacy of the HIA's consideration of the noise impacts is largely due to deficiencies in the input data provided to ERM by BAA and these inadequacies largely arise because of BAA's disregard for many of the requirements set down by UDC in its November 2004 Scoping Opinion, which were as follows [status – i.e. whether 'provided' or 'not provided' by BAA is shown in square brackets]:

- *50 and 54dBA Leq 16 hour daytime contours need to be calculated and the estimated populations within them, to enable consideration against WHO benchmarks* [two token 54 dBA contours have been provided by BAA but without any 2004 benchmark; no 50dBA contours have been provided]
- *44 and 47dBA Leq 16 hour daytime contours should also be calculated to indicate where air noise would exceed ambient noise levels in rural tranquil areas around Stansted* [not provided]
- *Confidence limits of LAeq contours must be stated* [not stated]
- *The implications of the development for air noise should include an assessment of the contribution from helicopter* [not provided] *and General Aviation* [provided] *movements*
- *Consideration of effect on the public realm as well as homes, schools and hospitals: the impact on the public realm including local parks, markets, places of worship, sports pitches, strategic public green space, and village halls should be included in the EA* [not provided]
- *Monitoring should be undertaken at a number of sites in and around Hatfield Forest and at other open space in the surrounding area* [not provided]
- *Impacts should be understood as part of the Quality of Life Assessment* [not provided]
- *Lden should be calculated as well as Leq 50 to 75dB Lden contours required* [50dBA contours not provided]
- *Night noise contours required* [provided – although no benchmark 2004 night contours – and, in any event, night flights have been ignored in HIA]
- *LAmax at specific points under NPRs*[20] *and glide paths required, to identify number of flights over 70dB* [provided]
- *Reports of increases in flight movements on different NPRs and arrivals tracks should be in the format used in the Australian discussion paper 'Expanding*

[19] 'The Heathrow Terminal Five and Associated Public Inquiries', 2001, para 21.3.28, Roy Vandermeer QC.
[20] Noise Preferential Routes.

ways to describe and assess aircraft noise' (ISBN 0 642 42262 1) in particular the 'average daily movements' as shown in Chapter 2 [not provided]

- *The contours for an average 'all easterly day (05)' and an 'all westerly day (23)' should also be calculated as this gives a much better picture of how noise is experienced by residents* [not provided]
- *Inclusion of landside road and rail traffic in assessments* [not provided]
- *Ground noise contours must be prepared for on airport activity* [provided], *increased surface access movements* [not provided] *and for a combination of both sources* [not provided]

6.1.8 One is tempted to ask why ERM did not insist on similar data to that requested by UDC so that the noise impacts and their potential effect upon community health could be properly assessed. The fact that ERM was content to accept the limited data provided by BAA – and accept this without questioning its veracity – speaks volumes about the role which ERM adopted on behalf of its client. One also has to ask why the expert panel associated with this study was content for the assessment of noise impacts to proceed on the basis of such limited noise data. As we have previously pointed out, it is disappointing that, in assessing the health impacts of increased aircraft noise, ERM has paid so little attention to the WHO Guidelines for Community Noise. The WHO Guidelines are particularly useful, since they include separate recommendations for day and night and for specific environments, including dwellings (indoor and outdoor) as well as schools and hospitals.[21]

6.1.9 During our meeting with the Medical Director of the Essex SHA (March 2006) we expressed the view that it was the duty of the SHA to safeguard the health of the community, challenging unsatisfactory and discredited methods of assessing and depicting the annoyance caused by aviation noise. However, the Director stated that the decision about noise standards had been made by Central Government and it was not within his power to question this. This is contrary to the general principle that doctors, regardless of their speciality, should not only question, but be shown to question, recommendations that are not consistent with the wellbeing of their patients or the communities they serve.

6.2 Health and related adverse impacts, including impacts on education

6.2.1 Noise from aircraft and airports can be detrimental to health. Significant noise impacts arise from three main sources:

- aircraft in flight, including during take-off and landing
- ground noise from aircraft during aircraft turn-around operations and during engine maintenance and testing operations
- airport-related surface access sources, mainly passenger-generated road traffic but also heavy goods vehicles involved in transporting goods

6.2.2 Health impairment may be the result of acoustic or non-acoustic (for example, effects on the cardiovascular system) influences. The detrimental effect of noise has generally been described adequately in the HIA and is also summarised in a recent review in The Lancet (Banatvala, 2004) which is attached at Appendix 2 to this response. It is therefore not necessary to review all of the main research

[21] WHO Guidelines for Community Noise, 1998, Appendix 2.

evidence and academic literature again but we do need to comment on the HIA's relatively dismissive view of the 'RANCH' study.[22]

6.2.3 The term 'jet pause' is used to describe interruptions in communication due to overflying aircraft disturbing classroom activity and, for children to hear their teachers, it is recommended that background noise levels in a classroom should be at least 10dBA below the teacher's voice (Wetherill 2002). Those involved in teaching at schools near busy airports, including Stansted and Heathrow, complain of children losing concentration as a result of noise from overflying aircraft and about having to shout frequently during class time. Indeed, the ATWP recognised the problem, even proposing measures such as the funding of school trips away from the noisy environment.[23]

6.2.4 The RANCH study was a cross-national and cross-sectional study involving 2844 children aged 9–10 years at 89 schools in the Netherlands, Spain and the UK. The schools selected were in local authority areas around three major airports – Amsterdam Schiphol, Madrid Barabas and London Heathrow. The study extended previous findings not only confirming that aircraft noise is a chronic environmental stressor but also that it impairs cognitive development in children. The HIA expresses the view that the RANCH study was only a single report and that its conclusions can only be applied to 9-10 year old children and not to older or younger children. However, the scale of the RANCH study, as well as its provenance, merit considerable weight for its findings. In addition, the results of the West London Schools study[24] and the highly regarded Munich study[25] add to the evidence that aircraft noise impairs the cognitive development of school children. In the Munich study the impacts were reversed when the old airport closed but then emerged in children at school near the new Munich International Airport. The HIA seems to take some comfort from this observation. However, proposals are not to close Stansted Airport, but to expand it and consequently the adverse effects will not be reversed on generations of school children at school in the vicinity of Stansted Airport. The Munich study also showed that stress responses such as increased systolic blood pressure and higher levels of resting adrenaline and noradrenaline were also observed when compared with children not exposed to chronic aircraft noise.

6.2.5 The HIA states that there are only four schools (Spellbrook Primary School, Little Hallingbury Primary School, Thaxted Primary School and Howe Green House School at Great Hallingbury) located within a 54dBA Leq contour for both 25mppa and 35mppa. However, the RANCH study showed that children experienced cognitive defects at a lower sound pressure level and the HIA itself draws attention to the fact that there are many schools in and around Bishop's Stortford and elsewhere that have aircraft noise exposures above 40dBA Leq but less than 54dBA Leq. It must also be pointed out that the WHO Guidelines recommend that background sound pressure levels should not exceed 35dBA Leq during teaching sessions.

6.2.6 Noise assessment studies carried out for individual schools in the vicinity of the airport by Essex County Council Schools Service in 2005 indicate that **more** than four schools would be affected. These studies looked only at outdoor noise levels[26] and not specifically at classroom levels and so this is an obvious area for

[22] 'Aircraft and road traffic noise and children's cognition and health: a cross national study', Stansfield et al, *The Lancet*, Jun 2005.
[23] ATWP, para 3.23, p36.
[24] 'Children's cognition and aircraft noise exposure at home' - West London Schools Study, Matsui et al, *Nature & Health*, 2004.
[25] 'Chronic Noise and Psychological Stress', Hygge, Evans & Bullinger*, Psychological Sciences*, Nov 1995, Vol 6.
[26] Indoor (classroom) noise levels can be expected to be 10-15dBA below outdoor levels if windows are closed although this is dependent upon the level of sound insulation of the building as well as of the windows themselves.

follow-up study. Also, BAA has not provided noise data in an appropriate form for properly assessing the noise impact on schools, such as Leq data for the school day (say 9am-4pm) and LAmax and ATM frequency data. This would be relatively easy to provide and would enable improved assessment of the additional noise impacts upon specific schools in the vicinity of the airport if the application were to be approved. It is both surprising and disappointing that the HIA reaches a firm conclusion that no mitigation is needed in relation to local schools on the basis of the limited data that BAA provided to ERM. Even if only to examine the scope for mitigation, one would have expected that an issue as important as the education of local children would have merited more thorough investigation in the HIA.

6.3 Sleep disturbance from night flights

6.3.1 As previously stated, the HIA completely disregards the health effects of the potential 43% increase[27] in night flights during the night quota period (2330 –0600 hours). The HIA argues that night flights can be ignored because this is a matter for the DfT. Historically, however, the DfT night flights number quota at Stansted has been of no practical significance to the actual number of night flights because it has never been more than 77% utilised at Stansted. In addition, the DfT quota applies only until 2011/12 whereas the HIA is examining the implications for 2014/15. In short, we do not agree that the existence of a DfT quota (or even the non-existence of a DfT quota from 2012 onwards) constitutes grounds for ignoring the health effects of additional night flights. As we stated earlier, the HIA should take account of cumulative impacts (not simply hypothetical 'net' impacts) whether or not these are contingent upon planning consent for this particular development.

6.3.2 We would also point out that, if the logic of BAA's argument were to be accepted, the DfT should have carried out an HIA before determining the night flights quota for Stansted (and Heathrow and Gatwick); otherwise, night flights would always escape the requirement for health impact assessment. The DfT has *not* carried out an HIA in respect of night flights at Stansted and, in the ATWP, the DfT states that airport operators

> *will have to meet the requirements for environmental impact assessment, and will also be expected to undertake appropriate health impact assessments.* [28]

It can reasonably be assumed that the DfT expects airport operators to examine all of the key areas giving rise to potential health effects within the scope of such HIAs.

6.3.3 Sleep disturbance at night, although variable even within families, can have serious detrimental effects on health. Some of these effects are discussed in the HIA and summarised in the Lancet review included in Appendix 2. There is a general presumption that indoor noise levels are about 10-15dBA below outdoor noise levels and so sleep disturbance is substantially reduced. However, this at least partially rests on an assumption that people have their bedroom windows closed – an option that is often not realistically possible in the summer months, especially in the case of young children and the elderly who are especially prone to sleep disturbance and often also breathing difficulties if confined to a hot 'airless' bedroom environment.

6.3.4 The HIA states that the proposed development would produce no additional aircraft movements for the evening part of the shoulder period (2300 hours to 2330

[27] to 12,000 per annum compared to 8,370 in year ended 25 March 2006.
[28] ATWP, para 12.2, p139.

hours) and only about four additional aircraft movements for the early morning period (0600 hours to 0700 hours). This is wrong even by BAA's own figures, which are as follows:

Table 6.1: Stansted ATMs during morning shoulder period

ATMs between 0600 and 0700	2004 Baseline	25mppa scenario 2014	35mppa scenario 2014
Arrivals	5	8	12
Departures	29	29	33
Total ATMs	34	37	45

Source: BAA Environmental Statement, Volume 2, Figures 7 and 8

As the above table shows, the proposed expansion would result in a 32% increase (45 vs 34) in ATMs between 0600 and 0700 hours. This is despite the fact that the morning shoulder period at Stansted is already used very intensively compared to other airports – a feature of an airport dominated by low-cost carriers who aim to utilise their aircraft for four round trips per day.

6.3.5 Disturbance during the shoulder periods is a particularly acute issue since this represents the time at which people are falling asleep or the time just before their usual awakening. Even the status quo is unacceptable – especially when the combination of air noise and ground noise is considered – and, consistent with the ATWP policy objective to bear down on night noise and the encouragement given in the ATWP for local controls to reduce noise impacts, the HIA should have been recommending measures to reduce ATMs during the shoulder periods. In the interests of community health, UDC should itself address this issue; it has the power to do so and there is sufficient evidence of sleep disturbance and the health impacts thereof to justify action by UDC, even in relation to the '25mppa status quo'.

6.3.6 Rather than make glib statements, the HIA should have carried out a study to question a cross section of those living in the vicinity of the airport and further afield beneath flight paths about sleep disturbance during the shoulder periods and during the night period. The BAA complaints data are of limited value since they are received and analysed (often unreliably) by BAA's Flight Evaluation Unit. In any case, the number of actual complaints is a gross underestimate of those who are disturbed and it is likely that many, having complained on a number of occasions and often without response from BAA, now feel that there is little to be gained in doing so again. The current system of analysing complaints, which is not carried out by an independent organisation, lacks transparency and arouses suspicion.

6.3.7 Analysis of complaints to BAA Stansted copied to SSE indicates that many people living in the vicinity of the airport, and indeed quite far afield, already complain that they are disturbed not only during the shoulder periods but also increasingly through the night. In fact, complaints during the 6.5 hour night quota period 'NQP' are nearly five times as frequent (per movement) as complaints during the

remaining 17.5 hours.[29] The differential may well be even more marked if we were able to combine the shoulder periods with the NQP but the relevant data is not readily available.

6.3.8 The high proportion of cargo flights operating during the night using larger, noisier aircraft are a particular source of complaint about sleep disturbance. Cargo traffic is also associated with considerable night movement of heavy goods vehicles journeying to and from the airport and thereby adding to the noise impact of the cargo flights themselves.

6.3.9 Studies conducted near Amsterdam Schiphol Airport found that the percentage of the population expressing 'severe annoyance' from aircraft noise varied from 18% to 31% among those living within 25 km of the airport (Health Council of The Netherlands 1999). We do not have equivalent data for Stansted and it would have been useful if ERM had commissioned a similar research study. This omission is all the more surprising given the involvement of a representative (Wim Passchier) of the Health Council of the Netherlands on the HIA expert panel. However we are not surprised that this was not done. The Schiphol research showed that noise impacts upon the community were far more serious and far reaching than had previously been assumed and ERM's attempt to 'explain away' the Schiphol results with its own hypothesis is a further demonstration of its main objective in carrying out this HIA, namely to help its client to obtain planning approval.

6.3.10 In a similar vein, we note that ERM's explanation for the high level of concern about the detrimental impacts of aircraft noise that emerged from the 'stakeholder engagement' exercise is to dismiss this as irrational and attributable to a 'lack of knowledge'. This is not only condescending but also fails to grasp the seriousness of the current noise impacts of the airport upon the local community and the very obvious concern that the proposed expansion would make matters much worse.

6.4 Vulnerable groups

6.4.1 Apart from school children, the HIA makes little mention of the noise effects on vulnerable groups, including the elderly, whose quality of life would be further compromised by increased aircraft noise, even at relatively low noise pressure levels. This applies especially to those who already have hearing difficulties.

6.4.2 The handicapped and socially isolated are also particularly vulnerable. It is disappointing that the HIA did not give any special consideration to the potential impacts upon such groups within the local community. Data should have been provided to enable quantification and assessment of the impacts in this area.

[29] one complaint for every 16.9 movements during the NQP vs 1 complaint for every 81 movements during the remaining 17.5 hours (Nov 1 2005 – March 26 2006).

7 AIR QUALITY

7.1 Introduction

7.1.1 In general, air quality has improved considerably in the UK since the introduction of the Clean Air Act in the 1950s. However, national improvements in air quality are not maintained near large airports where aircraft pollution is augmented by road and rail traffic. Over 150 epidemiological studies have reported associations between particulate concentrations and ill health, particularly cardio-respiratory disease (Peters & Pope 2002). Increases in nitrogen dioxide, ozone, hydrocarbon and ultrafine particulate matter concentrations (such as PM_{10} and $PM_{2.5}$) might account for the extrapulmonary effects of air pollution (Nemmar & Hoet 2002).

7.1.2 The HIA concludes that any reduction in air quality arising from the proposed expansion is unlikely to pose a major threat to the health of the local community. This conclusion is reached despite the fact that predicted PM_{10} levels at 35mppa will exceed the statutory limits set by the EU Air Quality Directive and also despite the many uncertainties concerning the health impacts of certain airport-related pollutants; it is not yet known whether there is a threshold below which damage to health is unlikely.

7.2 Unreliability of the Health Impact Assessment

7.2.1 The HIA confidently states that the health impacts caused by poor air quality in the vicinity of Stansted are likely to be negligible but it is still not known what the major health issues are and, of particularly importance, whether there is a safe threshold below which damage to health is unlikely to occur. In addition, the HIA is based on the unreliable projections that emerged from BAA's assessment of the impacts of its proposed expansion upon air quality (Volume 3 of the ES). We identified a number of major shortcomings in BAA's assessment of the air quality impacts in our response (Volume 1, Section 6) including:

- The projections for incremental emissions arising from inadequately justified and differing assumptions for the 25mppa baseline and the 35 and 40mppa scenarios are over-optimistic and conveniently create the narrowest possible gap between what BAA predict would happen if the planning application were to be approved and what would happen if it were not approved.
- Inadequate baseline measurement data carried out by BAA in relation to the number of locations that have been monitored over a sufficient period of time including populated areas which may already have high NO_2 concentrations through a combination of road traffic and aircraft emissions. Areas in the vicinity of the M11/A120 have been excluded from baseline measurement apparently because it was felt that in such areas it was not possible to distinguish between the causes – i.e. road traffic or aircraft – even though this is irrelevant in terms of human exposure and in terms of statutory limits.
- The HIA takes no account of the recent report commissioned by UDC[30] showing that NO_2 levels in such places as Great Hallingbury, Start Hill and Burton End, which are close to both the airport and busy trunk roads, are either just below or indeed already above the statutory limit of an annual mean of 40 micrograms of NO_2 per m^3. These levels of NO_2 concentration

[30] 'Third Round Updating and Screening Assessment for Uttlesford District Council', Environmental Research Group, King's College London, May 2006.

would increase if the application were approved whereas UDC has a duty to work towards achieving levels below the statutory limits. We believe this constitutes material grounds for refusing the application – a view endorsed by two serving members on the DfT working groups for the 'Sustainable Heathrow' project. In addition, PPS23 emphasises

> *... the need for compliance with any statutory environmental quality standards or objectives (including the air quality objectives prescribed by the Air Quality 2000 and Amending Regulations 2002).*

7.2.2 The predicted PM_{10} levels at 35mppa will exceed the statutory level set by the EU Air Quality Directive 1999/30/EC for 2010 at a number of sites – a point which does not even appear to be acknowledged in the HIA – despite the fact that this lower level of exposure has been enacted because of the recognition that PM_{10} particles have a deleterious effect on human health. The effects of an incremental increase between 25mppa and 35mppa are irrelevant when statutory levels are exceeded. The precautionary approach takes precedence.

7.2.3 In contrast with Heathrow, Stansted has not had the benefit of full and continuous measurement of air quality. The DfT and BAA have committed considerable resources to examining air quality issues at Heathrow but there appears to be a presumption that because fewer people are affected at Stansted there is no need for the same level of effort. However, the limits set down in the EU Air Quality Directive make no distinction as to the number of people affected: every citizen is entitled to the same level of health protection from aircraft and airport-related emissions whether that citizen is a resident of a small rural community near Stansted or a large urbanised community near Heathrow.

7.2.4 The air quality impacts of the proposed expansion are of such fundamental importance to the health of the local community that we find it astonishing that ERM has been so readily prepared to accept BAA's projections without question. We also note the stark contrast between ERM's dismissal of academic research which challenges BAA's position (for example the RANCH study and the Schiphol research) and its unquestioning acceptance of far more tenuous data provided by BAA. In the case of research which is unhelpful to its client's objectives, ERM calls for further studies or seeks to explain away the results with its own dubious hypothesis. However on such a fundamental issue as air quality, ERM does not question either BAA's baseline or its projections, despite the fact that air quality limits are already breached or close to being breached in populated areas in the vicinity of the airport. The requirement to use 'sound science' (which should at the very least involve repeated and corroborated results) does not seem to apply to its client. This exemplifies the need for an independent HIA in order to ensure that the health of the local community is not subordinated to commercial interests.

7.2.5 The HIA also fails to address the potential long-term risks of certain aircraft emissions, for example carcinogens such as benzene. Again, it is the cumulative impacts which should be assessed for the combined impact of aircraft emissions and the additional road traffic emissions which would ensue from an airport handling 40mppa in 2014, 45mppa in 2021 and 50 mppa in 2030. Two forms of cancer, non-Hodgkin's lymphoma, until recently regarded as a rare malignancy, and multiple myeloma, have both increased markedly in the last 20 years. There is epidemiological evidence of benzene and perhaps other engine exhaust emissions being implicated (O'Connor et al. 1999, O'Connor et al. 2001).

8 SOCIAL CAPITAL

8.1 Introduction

8.1.1 The term 'social capital' is used to describe the shared values and behaviours that bind members of a community together and encourage social networking and co-operation for mutual benefit. This type of interaction helps to build trust and spirit within communities and encourages mutual support and a sense of belonging. The basic premise is that social capital has a very tangible value even though it consists of intangibles i.e. values and behaviours.

8.1.2 Social capital is a significant factor in relation to the perceived quality of life and wellbeing of communities and there is a considerable body of scientific evidence which shows that communities with a high degree of social capital are more likely to benefit from lower crime, better health and higher educational achievement.[31]

8.2 Community views on airport expansion

8.2.1 As part of the HIA, ERM carried out a questionnaire survey to obtain views about the perceived impacts of airport expansion from the local community (over quite a wide area). The responses are analysed in the HIA and show an overwhelmingly negative response. The results, which are set out in Annex C9 of the HIA are worth highlighting here and are therefore shown in Table 8.1 below:

Table 8.1: Public perception of health impact of proposed development

Impact	Negative impact	Positive impact	No change	No answer
Noise level	**85%**	**0%**	**15%**	**0%**
Air pollution	**90%**	**0%**	**10%**	**0%**
Traffic	**83%**	**0%**	**17%**	**0%**
Access and use of transport	**48%**	**7%**	**45%**	**0%**
Housing	**51%**	**3%**	**46%**	**0%**
Road safety	**70%**	**0%**	**30%**	**0%**
Employment	**16%**	**15%**	**68%**	**1%**
Access to services and amenities	**42%**	**8%**	**49%**	**1%**
Community networks	**32%**	**5%**	**63%**	**0%**
Overall quality of health and wellbeing	**85%**	**0%**	**15%**	**0%**

8.2.2 The above results are quite startling in themselves and even more so when one considers that, assuming a random cross-sectional sample of the population was taken, the respondents must have included a considerable number of airport employees and business people with a vested interest in expansion. The average

[31] For example: Putnam, R.D., 'The prosperous community: Social capital and economic growth', 1993; Bourdieu, P., 'The forms of capital', 1986; and Coleman, J., 'Social Capital, Human Capital and Schools', 1988.

positive score over all ten issues is 3.8% whereas the average negative score is 60.2%. By any standards this is an overwhelmingly negative response and suggests that there is a high degree of public awareness and understanding of the issues. This view is reinforced by the very small number of 'don't knows'.

8.2.3 It is even more startling that ERM dismisses the validity of the results of its own questionnaire survey by concluding that the results are irrational and demonstrate a lack of knowledge on the part of the local community. Again, we have an ERM hypothesis aimed at pleasing its client, wholly unsubstantiated and appallingly condescending. ERM is in effect saying that those who endure the real day-to-day impacts of the airport do not know what they are talking about. One wonders whether a fully independent HIA would have reached the same conclusion on the basis of the evidence set out in Table 8.1 above. An independent HIA would at least have considered the possibility that the respondents' views were valid.

8.2.4 A further indication of ERM's locus in relation to the HIA is provided in para 8.2.3 of the HIA which states

> *The stakeholder engagement identified that **some** people in local communities perceive that health impacts will occur ...* [our emphasis]

The use of the word 'some' is hardly appropriate in view of the results of the questionnaire survey which showed that an overwhelming majority of those consulted felt that there would be negative health impacts arising from the proposed development. It is quite obviously an attempt to play down the level of community concern about the health impacts of the proposed development.

8.3 Studies on social capital

8.3.1 This important area has not been covered satisfactorily in the HIA. However, a number of useful insights are provided in a 2002 report by Uttlesford PCT[32] which concluded that the expansion of Stansted Airport would have a number of negative effects on the health of the population including:

- *Social disruption and loss of social capital may decrease the existing local population's health and that of the new incoming population.*
- *Air quality will deteriorate because of increased planes and vehicles.*
- *Accidents will increase due to building work, increased population and increased road traffic.*
- *Noise pollution will increase both from planes and from all the associated traffic and building.*
- *Children's health is particularly vulnerable for those living close to airports.*
- *Health and social services may be unable to recruit and retain workers to continue to provide the high level of service Uttlesford already enjoys.*
- *Substantial investment is needed in hospital care to support expansion.*
- *Funding of the infrastructure is linked to residency, many more people will use the local services than are funded for.*
- *Schools may be unable to recruit and retain staff and children may have to travel further to schools.*
- *Loss of green belt will damage the local environment*
- *Soil and water pollution by the airport and associated industries.*
- *Importation of infectious diseases.*
- *Exposure to major disasters.*

[32] 'Rapid Screening for Health Impact of Expansion of Stansted Airport', Uttlesford PCT, 2002.

- *Occupational health risks of the airport.*

8.3.2 One of the key recommendations of the 2002 Uttlesford PCT report was that 'all proposals should have an **independent** HIA'. [our emphasis]. The report also identified a number of significant resource implications relating to the expansion of the airport and local population, stressing that the PCT has a responsibility for the health of the existing population and for any increase in resourcing generated by airport expansion. This, of course, includes not only for those working in and around the airport, but also their families.

8.3.3 The HIA barely gives any consideration to the knock-on effects of airport expansion on primary and secondary care. Social capital must consider an integrated approach to the care of communities, particularly if there is to be an expansion of a major industrial complex such as an airport. For example, the major hospital in the catchment area, Princess Alexandra at Harlow, is already working at full capacity but the HIA makes no assessment of how the increased demand would be accommodated. The HIA should also have assessed the ability of ambulance services to cope with increased demand; the 2002 Uttlesford PCT Report stated that Uttlesford already had the slowest ambulance response times in Essex. And the HIA should also have examined the adequacy of port health facilities for the markedly increased number of passengers envisaged.

8.3.4 It is most unfortunate that Uttlesford PCT was unable to be more closely involved in the HIA although we would emphasise that this is not a criticism of the local PCT. We are fully aware of the resource pressures that the PCT has been facing as a result of planned reorganisation, and of the fact that it has been without a Director of Public Health Medicine since March 2005 which is a significant handicap for any PCT. In the circumstances it is not surprising that its involvement with the HIA was only very limited but nevertheless this is regrettable.

9 STRESS

9.1 Inadequate consideration of stress by the Health Impact Assessment

9.1.1 The questionnaire survey referred to above showed that the community perceives airport expansion as a negative influence on health. The HIA acknowledges that this perception may give rise to stress and anxiety but concludes that the community perception is largely irrational:

> *In taking account of the community and stakeholder feedback, regard has to be given to the issues raised. Whilst all the issues have relevance, as they may contribute to anxiety and stress, there are some that arise from a false understanding of the Airport's activities or consequences of the development. Such anxieties can often be addressed through the provision of the relevant information.* (HIA: para 4.2.8)

9.1.2 The HIA proposes no mitigation other than *'the provision of relevant information'* and yet the HIA acknowledges, for example, that increased road and rail congestion can be a cause of stress. It is illuminating to examine – purely as an example of the approach taken by ERM – what the HIA says with regard to mitigation of road traffic congestion:

> *STAL already has a comprehensive surface access strategy in place, designed to improve the proportion of passengers arriving by public transport and to encourage employees to reduce their use of private road vehicles. Both of these objectives will contribute to a reduction in traffic volumes, relative to a 'do nothing' scenario. Some targets and initiatives in this strategy are:*
>
> - *Improving the proportion of passengers using public transport. The airport currently has the highest mode share of all UK airports of approximately 40%.*
> - *Reducing single occupancy car use by employees to no more than 80% by 2010.*
> - *Providing up to £1 million until 2010 towards implementation of the recommendations of a study into the improvement of public transport services at the Airport.*
> - *Delivering further stages in the cycling network around the airport.*
> - *Managing demand of bus, coach and rail services through marketing of these services, in partnership with transport operators.*
>
> *Around the airport, STAL works with the Highways Agency and Essex County Council to assess the impact of the airport and its traffic on particular roads and junctions. This work considers such factors as congestion, as well as the implications of road layout for accidents. Examination of the accident statistics for the road network around the airport in the years 2000-2004 does not reveal any roads or junctions with abnormally high rates of accidents.*
>
> *There does* [sic] *not appear to be any additional options for BAA to reduce the risk of road traffic accidents further.*

9.1.3 The above is based on an entirely false assumption that there will be *'a reduction in traffic volumes, relative to a 'do nothing' scenario'* and this is presumably why no

mitigation is proposed. Even under BAA's 35mppa scenario, road traffic volumes would rise by about 50% compared to 2005 volumes.

9.2 Stress impacts arising from the proposed development

9.2.1 The HIA fails to consider any options for mitigating stress associated with aircraft noise, particularly night noise. Insistence on only quieter aircraft and fewer flights at night and during the shoulder periods provide obvious avenues for mitigation but the HIA suggests none of these options, not even as matters for potential further study and/or consideration. (The HIA also fails to address the non-auditory effects of noise, including long-term stressor effects on the cardiovascular system and effects on mental health of those with pre-existing psychiatric disease.)

9.2.2 Similarly, the HIA fails to consider options for reducing stress associated with commuting, particularly where road traffic congestion makes for delayed and unreliable journey times and/or rail journeys are unreliable, overcrowded and or subject to delays. The proposed development envisages no investment in road/rail infrastructure despite the fact that airport-related road and rail traffic could double if the application were to be approved and even on the basis of its 35mppa scenario. BAA acknowledges that there would be increased road and rail congestion and it therefore follows that there would be increased stress. This in turn could (self-evidently) be mitigated through investment in road and rail infrastructure so as to reduce congestion. The HIA conveniently ignores this issue.

9.2.3 The HIA also ignores stress associated with:

- disruption to established communities and uncertainties relating to justifiable concerns about general deterioration of the local environment, quality of life and devaluation of properties such that relocation becomes more difficult. This can be particularly stressful for those with young families and for the elderly who have lived for many years in local villages with a strong sense of community. This is already much in evidence as a result of recent airport growth and associated impacts on the community, as well as from the stress of living with the threat of further major expansion of the airport.
- an increase in the local population, taking account of the cumulative impacts of the development in relation to housing and development pressures
- progressive urbanisation leading to problems in health inequality and the prospect of increased crime which, again, is particularly stressful for those with young families and the elderly.

9.2.4 In summary, the HIA's fleeting consideration of the issue of stress – to the point of attributing it largely to misapprehension on the part of the local community – is nothing short of negligent. The feedback from the community pointed very clearly to the issues of major concern and there is no shortage of academic evidence identifying these issues as causes of anxiety and stress. Moreover there is no shortage of tangible options for mitigation in these areas and yet the HIA concludes that mitigation should consist of *'the provision of relevant information'.* Once again, ERM adopts a dismissive approach to a very real and serious health issue and once again this accentuates the need for an independent HIA.

10 EMPLOYMENT

10.1 Claimed benefits

10.1.1 ERM lays considerable emphasis on the health benefits arising from the additional employment that would be created by the proposed expansion, particularly in areas that are *'economically deprived or have high levels of inequalities – this would include areas such as Harlow and north east London'* (HIA: para 8.2.7).

10.1.2 We do not challenge the existence of health benefits in relation to employment but we do fundamentally challenge the basis for assessing the employment benefits that would arise from the proposed development and for weighing them against health costs to the wider community affected by Stansted Airport's operations. As we have shown in our main response (Volume 1: Section 8), displacement employment impacts arise in four areas, namely:

- domestic tourism
- Luton Airport
- inward investment
- carbon-intensive industries

10.1.3 The above four points are fully explained in our main response and when the impacts in those areas are considered, we believe that no net employment benefits arise from the proposed development locally, regionally or for the UK as a whole.

10.1.4 Part of the consideration is the fact that the local catchment area already experiences very low unemployment and has a highly skilled workforce whilst the majority of the jobs that would be created by the proposed development would be in relatively low-skilled occupations. Over the past two years, following the accession to the EU of new Member States, the airport has attracted a large number of immigrant workers from Central and Eastern Europe. This incoming workforce will give rise to cost implications in terms of the provision of accessible healthcare, education and new affordable housing to meet the needs of these workers and the needs of their families.

10.1.5 Given the relative scarcity of suitable local labour to meet the needs of an expanding airport and the relatively high wages that can be earned compared to wage levels in Central and Eastern Europe, it is reasonable to assume that the proposed expansion would lead to a substantial increase in the influx of additional airport workers from these areas – rather than from North and East London for which areas health benefits are being claimed by ERM's report. The employment benefit of the proposed expansion would therefore be shared between UK residents and new immigrant workers. This is less likely to be the case in relation to the displacement employment impacts.

10.1.6 The above issues are not even addressed in the HIA that has been produced by ERM and one of the key tasks of an independent HIA would be to consider the implications of the above in more detail.

11 CONCLUSIONS AND RECOMMENDATIONS

11.1 Conclusions

In the course of this response we have provided example after example of fundamental failings in the HIA prepared by ERM on behalf of BAA. We have not attempted to systematically list every example; we have merely listed sufficient examples to demonstrate the key failings which fall into five main areas:

11.1.1 The HIA has relied upon BAA input data which, as we have shown in Volumes 1 and 2 of our main response, is inherently flawed by significantly understating the adverse impacts, particularly in relation to noise, air quality and surface access and overstating the employment and economic 'benefits'. The HIA also replicates the major failings of BAA's Environmental Statement by only considering expansion to 40mppa, failing to consider cumulative impacts and focusing on 'incremental impacts' between an overstated 2014 baseline for 25mppa and understated 2014 projections for 35mppa and 40mppa.

11.1.2 Key health impact issues such as climate change and night flights have not been assessed in the HIA as a result of the narrow terms of reference defined by BAA.

11.1.3 Legitimate concerns expressed by the community in the questionnaire survey have been dismissed by ERM as a 'false understanding' without properly considering whether these concerns may have been well founded.

11.1.4 There is a consistent tendency throughout the HIA for ERM to dismiss evidence of adverse health impacts where such evidence is unhelpful to its client and to attach undue importance to evidence, however scant, which is helpful to its client.

11.1.5 The HIA's examination of the health impacts upon the local community is inadequate and superficial. It fails to pay due regard to the academic and other research evidence, fails to undertake primary research or otherwise investigate the issues at first hand (relying only on BAA data) and has seemingly been carried out with the sole intention of giving its client's proposals 'a clean bill of health'.

11.2 Recommendations

11.2.1 There is no more important duty for Uttlesford District Council than its absolute duty to ensure that the health of the local community is not put at risk as a direct consequence of any planning decision. The adverse health impacts of aviation are well known, particularly in relation to noise impacts, air quality impacts and stress. The HIA provided by BAA is not a serious, objective attempt to quantify and assess the health impacts of the proposed expansion. It is merely designed to facilitate approval of the planning application. This is wholly unacceptable.

11.2.2 Commercial interests should not be permitted to override health considerations and, given the paramount importance of the health and wellbeing of the local community, we can see no alternative but for UDC to commission an independent assessment of the health impacts of the proposed development so as to obtain an objective assessment of the impacts – including cumulative impacts. BAA should be invited to meet the cost of the independent HIA.

APPENDIX 1: WHO GUIDELINES FOR COMMUNITY NOISE, 1999

Specific environment	Critical health effect(s)	dBA Leq	Time period (hours)	LA max
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility & moderate annoyance, daytime & evening	35	16	
Inside bedrooms	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, night-time	45	8	60
School class rooms & pre-schools, indoors	Sleep disturbance, window open (outdoor values)	35	during class	-
Pre-school bedrooms, indoor	Speech intelligibility, disturbance of information extraction, message communication	30	sleeping time	45
School, playground outdoor	Annoyance (external source)	55	during play	-
Hospital, ward rooms, indoors	Sleep disturbance, night-time	30	8	45
Hospitals, treatment rooms, indoors	Sleep disturbance, daytime and evenings	as low as possible		
	Interference with rest and recovery	70	24	110
Industrial, commercial shopping and traffic areas, indoors and outdoors	Hearing impairment	100	4	110
Ceremonies, festivals and entertainment events	Hearing impairment (patrons:<5 times/year)	85	1	110
Public addresses, indoors and outdoors	Hearing impairment	85 #1	1	110
Music and other sounds through headphones/ earphones	Hearing impairment (free-field value)	- -	- -	140 #2 120 #2
Impulse sounds from toys, fireworks and firearms	Hearing impairment (adults) Hearing impairment (children)	Existing quiet outdoor areas should be preserved and ratio of intruding noise to natural background sound should be kept low.		
Outdoors in parkland and conservations areas	Disruption of tranquillity	As low as possible		

#1: Under headphones, adapted to free-field values.

#2: Peak sound pressure (not LAF, max) measured 100 mm from the ear.

APPENDIX 2: UNHEALTHY AIRPORTS

By Professor Jangu Banatvala - from *The Lancet* 21 August 2004

Global aviation growth has resulted in proposals to enlarge or build new airports. These changes must be consistent with the wellbeing of local communities, and should consider the long-term risks for aircraft emissions inducing climatic change. The UK Government's chief scientist[1] and prime minister[2] both name climate change as the world's greatest threat. Yet, the government's white paper[3] proposes major developments for London airports, with Stansted as potentially the world's largest.

The Royal Commission's Environmental Pollution Report[4] states that unchecked, air-travel will soon be the major factor driving climate change with consequences from air pollution, flooding and water scarcity and, potentially, tropical diseases in temperate climates. Short-haul passenger flights have disproportionate effects. The report emphasises restriction of further airport development as crucial.

EU members have adopted the 1999 WHO Charter recommendations[5] which state that the welfare of communities must be put first when creating transport policy. Adverse effects fall disproportionately on those who are vulnerable – i.e. children, elderly people, those with disabilities, and those who are socially excluded. WHO stresses the importance of doing environmental and health impact assessments (EIA and HIA) to ensure noise-pressure levels are acceptable for environments including dwellings, schools, and hospitals as well as air quality levels.

Adults repeatedly disturbed by noise suffer sleep-loss, fatigue, and accidents from concentration failure, especially while doing complex tasks. Studies showed up to 500 000 people near Amsterdam's Schiphol airport were affected by sleep loss.[6] Primary school children exposed to noise experience reduced cognitive performance.[7] WHO recommends background sound pressure levels should not exceed 35 dBA during teaching sessions. In London Jet Pause describes interruptions in communication due to low-flying aircraft, which disturb classroom activity every 60–90 seconds. Long-term memory and reading deficits in schoolchildren were reversed when Munich airport closed, but emerged in children near the new International airport.[8] Worryingly, stress responses, such as significantly increased systolic blood-pressure and significantly higher levels of resting adrenaline and noradrenaline were also recorded compared with children not exposed to chronic aircraft noise.[7] Even the White Paper recommends the funding of school trips away, especially when loss of outdoor amenities become severe![3] Conflicting earlier reports notwithstanding, evidence now suggests that persistent exposure to noise above an observation threshold of 70 dBA could be a risk factor for ischaemic heart disease in adults.[7]

National improvements in air quality are not maintained near large airports where aircraft pollution is augmented by road, rail-traffic, and industrial emissions. Over 150 epidemiological studies report associations between particulate concentration and ill health, especially cardio-respiratory disease.[9] Increases of nitrogen dioxide, ozone, hydrocarbon, and ultrafine and particulate matter levels (e.g. PM_{10} and $PM_{2.5}$) might account for the extrapulmonary effects of air pollution.[10] What the major culprits are and whether a threshold exists below which damage to health is unlikely are unknown.

EIAs and HIAs should consider local and global issues and measures mitigating ill effects. Sophisticated measurement of noise and air quality is essential and the 50 dBA Leq recommended by WHO covers a much wider area, and correlates better with radar maps of flight paths and public complaints, than the Department of Transport's 57 dBA Leq noise pressure levels which underestimate the number of people affected. However, the Leq metric

itself is flawed in that it averages noise levels over a 16-hour day, without taking into account flight frequency, type of aircraft, peak intensity, or changes in take off and landing patterns. It will take some years before newer larger aircraft eventually phase out noisier ones (especially for developing countries), but these reduced noise levels result in increased fuel-burn and CO2 emissions and thus diminished air quality. The model for assessing air quality at airports in the white paper (Atmospheric Dispersion Model System 3) was developed not for airports, but for industrial sources.

For EIAs and HIAs to safeguard communities affected by major airport developments, a holistic approach is needed ensuring stakeholders are involved in consultation. In the UK, this responsibility is delegated to BAA (British Airports Authority) acting as both enabler and regulator. But BAA has a monopoly in controlling southeast England airports and its major obligation is to shareholders. This conflict of interest will do little to convince communities threatened by airport expansion that commercial interests will not override environmental and health considerations. The Department of Health states that HIAs should be commissioned before the proposed developments, having little value if recommendations arrive after key decisions have already been taken[11] this exercise should therefore have been done before publishing the White Paper.

An integrated approach with input from the Departments of Transport, Health, and Education and Technology, supported by independent high-quality research, is needed to assess environmental and other medico-social effects of airport development, on-land or offshore. But who pays?

Jangu Banatvala
Guy's King's & St Thomas' School of Medicine & Dentistry, London SE1 7EH, UK

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