

**Lancashire County Council Planning
Application Reference: 11/05/1584
Completion of the Heysham to M6 Link**

**Planning Inspectorate Reference:
APP/Q2371/V/07/1200928 &
APP/Q2371/V/07/1200929**

**Proof of evidence:
Noise**

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Evidence prepared for:

**The Environmental and Sustainable Transport
Alliance (ESTA)**

Consisting of:

**The Campaign to Protect Rural England (CPRE)
Lancashire Branch and NW Regional Group
Friends of the Earth (FOE) North West
North West Transport Activists Roundtable (NW TAR)
Sustrans
Transport 2000**

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Summary

- 1 Noise is a serious health hazard. There should be a presumption against inflicting increases of noise on specific geographical populations unless there are very special circumstances that point without any doubt towards the existence of a need and the absence of other policies or measures that could achieve the same objectives without inflicting the additional noise. This has not been demonstrated in the case for this road
- 2 Noise has a disproportionately serious affect on vulnerable groups in society and these include:
 - Those with particular diseases or medical problems e.g. high blood pressure
 - People dealing with complex cognitive tasks (e.g. those who are visually impaired)
 - Those with hearing impairment
 - Babies and children
 - The elderly
- 3 The case for the road has not identified those that might fall into these categories and has not taken any account of the fact that the health risks are a function of the size of the environmental problem (in this case noise) and the numbers of people affected by that problem and the distribution of vulnerable groups by exposure to different values of that problem.
- 4 Guidance on noise in WebTAG has not been followed. The noise bands used are different to those recommended in WebTag and the 600 metre distance band from the road has not been used. The likely result of this departure is an under-estimate of population numbers exposed to noise levels higher than the WHO recommended limit values
- 5 Population exposure levels (also recommended by WebTag) have not been calculated or presented to the Inquiry.
- 6 Important information on noise levels with and without the scheme has not been put before the Inquiry. Para 12.4.10 of the ES explicitly dismisses the without comparison in contradiction to WebTag advice
- 7 Seven hundred and ten properties in the 60-70 dB (A) band (and an unknown number of people in vulnerable groups) are predicted to be exposed to noise increases when they are already exposed to noise levels that exceed WHO guidelines (see below) and a further 122 properties exposed to seriously high levels of noise are also to be exposed to predicted increases. The same upward lift of noise exposure is predicted to apply to 18 community facilities in the lower of these two bands and 12 in the higher. This is a serious departure from the norms of environmental protection and of sustainable development

- 8 We have shown in table 3.9.1 that 832 residential properties that are in noise bands above 60dB(A) will experience an increase in noise. This underestimates total exposure to increased noise above 55dB(A) because we are not able to disaggregate the 50-60 dB (A) band in Table 12.4.3 into 50-55 and 55-60. Also we only have figures for the 300 metre distance band and not for WebTag recommended 600 metre distance band. We conclude that there is a serious underestimation of population numbers exposed as a result of this road to noise levels above the WHO critical value of 55dB(A).
- 9 The HM6L is directly contrary to government policy on sustainable communities and to advice on sustainability in PPS1
- 10 A project that imposes increased noise levels on an established community against a back ground of an evidence base showing that these noise levels contribute to health damage is in direct contradiction to policy objectives that include:
 - Developing strong vibrant and sustainable communities
 - Promoting personal well-being
 - Taking into account the needs of all the community
 - Deliver safe, healthy and attractive places in which live
- 11 Nighttime noise is damaging to human health and this is recognised by the WHO in setting its threshold value at 45dB(A) for “outside bedroom”. This has not been evaluated by the proposer and the likelihood is that given the frequent reference to HGV traffic servicing the port of Heysham, there will be additional nighttime noise that is damaging to human health. The recommendation in WebTag to be careful with nighttime noise has not been followed.
- 12 There is a serious data deficiency on noise in the case for the HM6L. Contrary to best practice we do not have before and after noise levels information in useful noise measurement bands.
- 13 The policy framework within noise is discussed and evaluated and within which interventions and measures are constructed is changing. European legislation, already transposed into UK legislation, requires detailed mapping and evaluation of noise and the production of a noise reduction plan. The HM6L unnecessarily fetters the ability of public bodies to produce interventions that will assist in delivering a healthy noise environment. It produces a significant source of additional noise that is close to a large residential environment. This counters the public policy intention and commitment to reduce noise exposure to levels recommended by the WHO which are those needed to protect human health
- 14 The HM6L will introduce noise levels into an area characterised by a large residential population, rural tranquility and a significant institutional presence (the Lancaster and Morecambe College). It worsens the noise environment for a large number of people and it renders emerging public policy to create healthy noise environments difficult or impossible to achieve. On these grounds alone the road should be rejected.

1 Introduction

- 1.1 My name is John Whitelegg and I am Visiting Professor of Sustainable Transport at Liverpool John Moores University, Professorial staff member of the Stockholm Environment Institute at the University of York and Managing Director of the transport consultancy, Eco-Logica Ltd. I have lived in Lancaster for 30 years and am a Lancaster City councillor. My evidence and appearance at this inquiry is in my capacity as a transport professional and a transport consultant
- 1.2 I am the author of ten books on transport and of reports on transport policy and practice including “Roads, Jobs and the economy”, “Driven to Destruction: absurd freight movement and European road building”, “Driven to Shop: transport intensity and the environment”, “Freight transport, logistics and sustainable development” and “Traffic and Health”
- 1.3 I have presented evidence on various matters at the public inquiries into the Birmingham Northern Relief Road, the Broughton (Lancashire) Bypass, Heathrow Terminal 5, Manchester Runway 2, the Thames Gateway Bridge, Walton Bridge (Surrey) and the BAA appeal against the decision of Uttlesford District Council to refuse planning permission for the expansion of Stansted Airport
- 1.4 In this proof of evidence I will examine the case presented by Lancashire County Council for this road on noise. I will also present evidence to this Inquiry on air quality, climate change and accidents.

2 Noise

- 2.1 Noise is a serious health hazard. There should be a presumption against inflicting increases of noise on specific geographical populations unless there are pressing circumstances that point without any doubt towards the existence of a pressing need and the absence of other policies or measures that could achieve the same objectives without inflicting the additional noise.
- 2.2 Noise is an area of environmental impact and associated policy intervention where progress is difficult and conditions are unsatisfactory:

Box 11: Estimated exposure in England and Wales to specified noise levels

- The World Health Organisation⁵ recommends that ‘to protect the majority of people from being seriously annoyed during the day-time, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB L_{Aeq} for a steady continuous noise’... ‘At night, sound pressure levels at the outside façades of the living spaces should not exceed 45 dB L_{Aeq} and 60 dB L_{Amax} , so that people may sleep with bedroom windows open.’
- Assuming a 0700-2300 daytime, 55 per cent of the population of England and Wales were exposed to levels exceeding the 55 dB L_{Aeq} guideline in 2000, compared with 60 per cent in 1990.
- Assuming a 2300-0700 night, 68 per cent of the population of England and Wales were exposed to levels exceeding the 45 dB L_{Aeq} guideline in 2000, compared with 66 per cent in 1990, though this increase is not statistically significant.
- In both 1990 and 2000, eight per cent of the population of England and Wales were estimated to be exposed to a façade level of over 68 dB $L_{A10, 18\text{ hour}}$ - the level at which offers of sound insulation would be made under the Noise Insulation Regulations if dwellings were affected by noise increases from a new road.

Source: Mayor of London (2004), Ambient Noise Strategy, page 25

http://www.london.gov.uk/mayor/strategies/noise/docs/noise_strategy_all.pdf

The relatively poor performance of public policy intervention in noise reduction and prevention should, I suggest, trigger a response along the lines of “when in a hole stop digging”. Logically we should avoid any intervention that makes the situation worse. The Heysham M6 Link (HM6L) makes the situation worse.

- 2.3 Other evidence presented at this inquiry will show that the recommendations in WebTag on option generation and development have not been adhered to by the proposer. At the level of uncomplicated facts options that could have achieved policy objectives and would not involve inflicting additional noise have not been pursued and have not been accorded the status and significance of building a new road. This is hardly contentious.
- 2.4 It is my view, therefore, that the decision to pursue an option involving the generation of additional noise is wrong and fails to protect human health and the rights of residents to the quiet

enjoyment of their homes. It also deprives residents and visitors alike of the quiet enjoyment of a tranquil area. The tranquillity issue is discussed elsewhere in ESTA's evidence by Mr Alan James.

2.5 In the evidence that I will present on noise I will seek to establish that:

- Noise has a significant detrimental affect on human health
- The bypass produces additional noise which is inconsistent with the principles of sustainable development and the government's commitment to improve health and deliver a high quality of life

3 Noise and human health

3.1 The detailed relationships between noise and negative impacts on human health have been researched in detail by the World Health Organisation and can be summarised as follows:

3. Adverse health effects of noise

The health significance of noise pollution is given in chapter 3 of the *Guidelines* under separate headings according to the specific effects: noise-induced hearing impairment; interference with speech communication; disturbance of rest and sleep; psychophysiological, mental-health and performance effects; effects on residential behaviour and annoyance; and interference with intended activities. This chapter also considers vulnerable groups and the combined effects of mixed noise sources.

Hearing impairment is typically defined as an increase in the threshold of hearing. Hearing deficits may be accompanied by tinnitus (ringing in the ears). Noise-induced hearing impairment occurs predominantly in the higher frequency range of 3 000–6 000 Hz, with the largest effect at 4 000 Hz. But with increasing LAeq,8h and increasing exposure time, noise-induced hearing impairment occurs even at frequencies as low as 2 000 Hz. However, hearing impairment is not expected to occur at LAeq,8h levels of 75 dB(A) or below, even for prolonged occupational noise exposure.

Worldwide, noise-induced hearing impairment is the most prevalent irreversible occupational hazard and it is estimated that 120 million people worldwide have disabling hearing difficulties. In developing countries, not only occupational noise but also environmental noise is an increasing risk factor for hearing impairment. Hearing damage can also be caused by certain diseases, some industrial chemicals, ototoxic drugs, blows to the head, accidents and hereditary origins. Hearing deterioration is also associated with the ageing process itself (presbycusis).

The extent of hearing impairment in populations exposed to occupational noise depends on the value of LAeq,8h, the number of noise-exposed years, and on individual susceptibility. Men and women are equally at risk for noise-induced hearing impairment. It is expected that environmental and leisure-time noise with a LAeq,24h of 70 dB(A) or below will not cause hearing impairment in the large majority of people, even after a lifetime exposure. For adults exposed to impulse noise at the workplace, the noise limit is set at peak sound pressure levels of 140 dB, and the same limit is assumed to be appropriate for environmental and leisure-time noise. In the case of children, however, taking into account their habits while playing with noisy toys, the peak sound pressure should never exceed 120 dB. For shooting noise with LAeq,24h levels greater than 80 dB(A), there may be an increased risk for noise-induced hearing impairment.

The main social consequence of hearing impairment is the inability to understand speech in daily living conditions, and this is considered to be a severe social handicap. Even small values of hearing impairment (10 dB averaged over 2 000 and 4 000 Hz and over both ears) may adversely affect speech comprehension.

Speech intelligibility is adversely affected by noise. Most of the acoustical energy of speech is in the frequency range of 100–6 000 Hz, with the most important cue-bearing energy being between 300–3 000 Hz. Speech interference is basically a masking process, in which simultaneous interfering noise renders speech incapable of being understood. Environmental noise may also mask other acoustical signals that are important for daily life, such as door bells, telephone signals, alarm clocks, fire alarms and other warning signals, and music.

Speech intelligibility in everyday living conditions is influenced by speech level; speech pronunciation; talker-to-listener distance; sound level and other characteristics of the interfering noise; hearing acuity; and by the level of attention. Indoors, speech communication is also affected by the reverberation characteristics of the room. Reverberation times over 1 s produce loss in speech discrimination and make speech perception more difficult and straining. For full sentence intelligibility in listeners with normal hearing, the signal-to-noise ratio (i.e. the difference between the speech level and the sound level of the interfering noise) should be at least 15 dB(A). Since the sound pressure level of normal speech is about 50 dB(A), noise with sound levels of 35 dB(A) or more interferes with the intelligibility of speech in smaller rooms. For vulnerable groups even lower background levels are needed, and a reverberation time below 0.6 s is desirable for adequate speech intelligibility, even in a quiet environment.

The inability to understand speech results in a large number of personal handicaps and behavioural changes. Particularly vulnerable are the hearing impaired, the elderly, children in the process of language and reading acquisition, and individuals who are not familiar with the spoken language.

Sleep disturbance is a major effect of environmental noise. It may cause primary effects during sleep, and secondary effects that can be assessed the day after night-time noise exposure. Uninterrupted sleep is a prerequisite for good physiological and mental functioning, and the primary effects of sleep disturbance are: difficulty in falling asleep; awakenings and alterations of sleep stages or depth; increased blood pressure, heart rate and finger pulse amplitude; vasoconstriction; changes in respiration; cardiac arrhythmia; and increased body movements. The difference between the sound levels of a noise event and background sound levels, rather than the absolute noise level, may determine the reaction probability. The probability of being awakened increases with the number of noise events per night. The secondary, or after-effects, the following morning or day(s) are: reduced perceived sleep quality; increased fatigue; depressed mood or well-being; and decreased performance.

For a good night's sleep, the equivalent sound level should not exceed 30 dB(A) for continuous background noise, and individual noise events exceeding 45 dB(A) should be avoided. In setting limits for single night-time noise exposures, the intermittent character of the noise has to be taken into account. This can be achieved, for example, by measuring the number of noise events, as well as the difference between the maximum sound level and the background sound level. Special attention should also be given to: noise sources in an environment with low background sound levels; combinations of noise and vibrations; and to noise sources with low-frequency components.

Physiological Functions. In workers exposed to noise, and in people living near airports, industries and noisy streets, noise exposure may have a large temporary, as well as permanent, impact on physiological functions. After prolonged exposure, susceptible individuals in the general population may develop permanent effects, such as hypertension and ischaemic heart disease associated with exposure to high sound levels. The magnitude and duration of the effects are determined in part by individual characteristics, lifestyle behaviours and environmental conditions. Sounds also evoke reflex responses, particularly when they are unfamiliar and have a sudden onset.

Workers exposed to high levels of industrial noise for 5–30 years may show increased blood pressure and an increased risk for hypertension. Cardiovascular effects have also been demonstrated after long-term exposure to air- and road-traffic with LAeq,24h values of 65–70 dB(A). Although the associations are weak, the effect is somewhat stronger for ischaemic heart disease than for hypertension. Still, these small risk increments are important because a large number of people are exposed.

Mental Illness. Environmental noise is not believed to cause mental illness directly, but it is assumed that it can accelerate and intensify the development of latent mental disorders. Exposure to high levels of occupational noise has been associated with development of neurosis, but the findings on environmental noise and mental-health effects are inconclusive. Nevertheless, studies on the use of drugs such as tranquillizers and sleeping pills, on psychiatric symptoms and on mental hospital admission rates, suggest that community noise may have adverse effects on mental health.

Performance. It has been shown, mainly in workers and children, that noise can adversely affect performance of cognitive tasks. Although noise-induced arousal may produce better performance in simple tasks in the short term, cognitive performance substantially deteriorates for more complex tasks. Reading, attention, problem solving and memorization are among the cognitive effects most strongly affected by noise. Noise can also act as a distracting stimulus and impulsive noise events may produce disruptive effects as a result of startle responses.

Noise exposure may also produce after-effects that negatively affect performance. In schools around airports, children chronically exposed to aircraft noise under-perform in proof reading, in persistence on challenging puzzles, in tests of reading acquisition and in motivational capabilities. It is crucial to recognize that some of the adaptation strategies to aircraft noise, and the effort necessary to maintain task performance, come at a price. Children from noisier areas have heightened sympathetic arousal, as indicated by increased stress hormone levels, and elevated resting blood pressure. Noise may also produce impairments and increase in errors at work, and some accidents may be an indicator of performance deficits.

Social and Behavioural Effects of Noise; Annoyance. Noise can produce a number of social and behavioural effects as well as annoyance. These effects are often complex, subtle and indirect and many effects are assumed to result from the interaction of a number of non-auditory variables. The effect of community noise on annoyance can be evaluated by questionnaires or by assessing the disturbance of specific activities. However, it should be recognized that equal levels of different traffic and industrial noises cause different magnitudes of annoyance. This is because annoyance in populations varies not only with the characteristics of the noise, including the noise source, but also depends to a large degree on many non-acoustical factors of a social, psychological, or economic nature. The correlation between noise exposure and general annoyance is much higher at group level than at individual level. Noise above 80 dB(A) may also reduce helping behaviour and increase aggressive behaviour. There is particular concern that high-level continuous noise exposures may increase the susceptibility of schoolchildren to feelings of helplessness.

Stronger reactions have been observed when noise is accompanied by vibrations and contains low-frequency components, or when the noise contains impulses, such as with shooting noise. Temporary, stronger reactions occur when the noise exposure increases over time, compared to a constant noise exposure. In most cases, LAeq,24h and L_{dn} are acceptable approximations of noise exposure related to annoyance. However, there is growing concern that all the component parameters should be individually assessed in noise exposure investigations, at least in the complex cases. There is no consensus on a model for total annoyance due to a combination of environmental noise sources.

Combined Effects on Health of Noise from Mixed Sources. Many acoustical environments consist of sounds from more than one source, i.e. there are mixed sources, and some combinations of effects are common. For example, noise may interfere with speech in the day and create sleep disturbance at night.

These conditions certainly apply to residential areas heavily polluted with noise. Therefore, it is important that the total adverse health load of noise be considered over 24 hours, and that the precautionary principle for sustainable development be applied.

Vulnerable Subgroups. Vulnerable subgroups of the general population should be considered when recommending noise protection or noise regulations. The types of noise effects, specific environments and specific lifestyles are all factors that should be addressed for these subgroups. Examples of vulnerable subgroups are: people with particular diseases or medical problems (e.g. high blood pressure); people in hospitals or rehabilitating at home; people dealing with complex cognitive tasks; the blind; people with hearing impairment; fetuses, babies and young children; and the elderly in general. People with impaired hearing are the most adversely affected with respect to speech intelligibility. Even slight hearing impairments in the high-frequency sound range may cause problems with speech perception in a noisy environment. A majority of the population belongs to the subgroup that is vulnerable to speech interference.

Source: World Health Organisation (1999), Guidelines for Community Noise

www.noiseoff.org/media.comnoise.1.pdf

3.2 The WHO is the most prestigious and authoritative source of evidence on this subject and its evidence points to two issues of some significance for an evaluation of the impact of the HM6L on the health of local residents:

- We need to know a great deal more about the number of people exposed to additional noise and the distribution of these people amongst the vulnerable groups identified by the WHO as of particular concern in this respect
- We need to know a great deal more about nighttime noise and the impact of sleep disturbance on the populations that will be exposed to this environmental problem

3.3 Vulnerable groups

3.3.1 The WHO identifies vulnerable groups as:

- Those with particular diseases or medical problems e.g. high blood pressure
- People dealing with complex cognitive tasks (e.g. those who are visually impaired)
- Those with hearing impairment
- Babies and children
- The elderly

- 3.3.2 There is no recognition of these important population sub-groups in the noise discussion in ES, Volume 1, Part A Report, Section 12. Indeed the ES at 12.1.2 chooses to emphasise “noise nuisance” and to side-step the rather more important issue of health damage
- 3.3.3 There is no discussion of numbers of people affected by increases in noise levels. The tables presented in s12 refer to properties
- 3.3.4 In order to evaluate the health impact of noise we need to know the number of people, that fall within the definition of vulnerable groups laid down by the WHO and the proposer has not attempted this. Essentially the health impacts of noise have been ignored.

3.4 Nighttime noise

2.4.1 Nighttime noise is an important component in the overall significance of noise impacts and health. It will be especially significant for the residents living near to the HM6L as this road is intended to facilitate HGV movements to the port of Heysham. This is discussed in section 4 of my evidence.

4 Noise impacts in the vicinity of the HM6L

- 4.1 Guidance on how to estimate traffic noise can be found in the latest version of WebTag:

Noise levels: the noise spreadsheet requires noise data to be in 3dB(A) bands^[6]. These bands are <45, 45-47.9, 48-50.9, 51-53.9, 54-56.9, 57-59.9, 60-62.9, 63-65.9, 66-68.9, 69-71.9, 72-74.9, 75-77.9, 78-80.9, and >81dB in terms of $L_{Aeq\ 18hr}$. The numbers of residential properties within noise bands in 3dB(A) increments along transport alignments should be assessed using simplified standard prediction methodologies, such as the Calculation of Road Traffic Noise and the Calculation of Railway Noise. Noise levels are required for the without scheme scenario and the with scheme scenarios for each transport option in order to reveal the change in noise faced at each residential property. Noise levels should be estimated for all residential properties within 600m of the transport infrastructure concerned in the scheme e.g. a road. More detailed data on properties within 300m and on properties further away from this can provide more accurate estimates of noise levels in given situations. Many factors, such as the type of ground cover, the presence and degree of screening, wind direction and strength, can all influence noise levels and the extent of the noise footprint. Professional judgement is needed to assess the significance of specific factors and to determine which can be disregarded.

http://www.webtag.org.uk/webdocuments/3_Expert/3_Environment_Objective/3.3.2.htm

- 4.2 The noise bands given in WebTag above and the recommendation that a 600 metre distance band should be used are both at variance with the ES at 12.4.9. The choice of 300m as opposed to the up-to-date government guidance (accessed on 1st June 2007) is especially worrying as it produces a significant under-estimation of the number of properties and hence the number of people affected by noise increases.
- 4.3 The use of noise bands in the ES at 12.4.9 that differ from WebTag will have the effect of under-estimating any potentially serious changes in noise i.e. those in the bands:

69-71.9
72-74.9
75-77.9
78-80.9
>81

These 5 bands are subsumed in one band, above 70dB(A), in ES 12.4.0

- 4.4 WebTag guidance on estimating the size of the population exposed to noise changes has not been followed:

For noise annoyance, populations within these noise bands should be estimated. In the TAG Noise Spreadsheet this is calculated automatically once the user inputs an estimate of average household size. Explicit assumptions may need to be made about population densities in order to estimate population exposure, although census data and, where available, building occupancy databases and other sources can also be used. In the absence of more refined information the national average of 2.36 people per household (2001 Census) can be used. (This is the default used in the TAG Noise spreadsheet).

Source: section 1.5.3 (iii) in WebTag

http://www.webtag.org.uk/webdocuments/3_Expert/3_Environment_Objective/3.3.2.htm

- 4.5 The net difference in populations affected by the scheme has not been calculated:

Overall assessment score

1.5.8 The entry in the Overall Assessment column should show:

- (i) The net difference in the estimated population who are likely to be annoyed in the longer term as a result of the option compared to the without scheme scenario in the fifteenth year;
- (ii) The estimated present value of the change in noise (at 2002 prices) discounted over the 60 year appraisal period.

These are both calculated as outputs from the TAG Noise Spreadsheet.

Source:

http://www.webtag.org.uk/webdocuments/3_Expert/3_Environment_Objective/3.3.2.htm

- 4.6 It is acknowledged that the proposer is using DMRB but Webtag is clear that DMRB output must be modified:

Data Transformation from DMRB to TAG

Data Requirements	Modify DMRB Output?	Data Source
<i>Worksheet</i>		
Without scheme noise levels, by noise band	Yes	DMRB 11.3.7 and use conversion given in 1.3.2 to express levels in terms of L _{Aeq}
With scheme noise levels, by noise band	Yes	DMRB 11.3.7 and use conversion given in 1.3.2 to express levels in terms of L _{Aeq}
Population exposed to different noise bands, With & Without Scheme	Yes	Factor No. of properties by average household size - 2.36
Population annoyed by noise	Yes	Use Table 1 in this TAG Unit
<i>AST</i>		

Net population than win/lose	Yes	From TAG Noise Spreadsheet
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Source: WebTag, section 2.2

http://www.webtag.org.uk/webdocuments/3_Expert/3_Environment_Objective/3.3.2.htm

- 4.7 The data transformation has not been done by the proposer
- 4.8 Important information on noise levels with and without the scheme has not been put before the Inquiry. Para 12.4.10 of the ES explicitly dismisses the without comparison in contradiction to WebTag advice
- 4.9 Information on changes in noise levels in difference noise bands is presented in the ES in Tables 12.4.2, 12.4.3, 12.4.4 and 12.4.5. For evaluation purposes we have extracted data on the increase in noise levels above 60dB(A) for residential, commercial, industrial and community facilities. This is shown below in table 3.9.1

Table 3.9.1

Summary of noise changes in the 60-70dB(A) band and the above 70dB(A) band. Increases in noise levels only

	residential	commercial	industrial	Community facilities
60-70dB(A)	710	28	22	18
> 70dB(A)	122	20	15	12

- 4.10 710 properties in the 60-70 dB (A) band (and an unknown number of people in vulnerable groups) are predicted to be exposed to noise increases when they are already exposed to noise levels that exceed WHO guidelines (see below) and a further 122 properties exposed to seriously high levels of noise are also to be exposed to predicted increases. The same upward lift of noise exposure is predicted to apply to 18 community facilities in the lower of these two bands and 12 in the higher. This is a serious departure from the norms of environmental protection and of sustainable development

4.11 The WHO has produced threshold value for noise levels that should not be exceeded. The guideline values have a specific meaning:

Table 1 presents the WHO guideline values arranged according to specific environments and critical health effects. The guideline values consider all identified adverse health effects for the specific environment. An adverse effect of noise refers to any temporary or long-term impairment of physical, psychological or social functioning that is associated with noise exposure. Specific noise limits have been set for each health effect, using the lowest noise level that produces an adverse health effect (i.e. the critical health effect). Although the guideline values refer to sound levels impacting the most exposed receiver at the listed environments, they are applicable to the general population. The time base for LAeq for “daytime” and “night-time” is 12–16 hours and 8 hours, respectively. No time base is given for evenings, but typically the guideline value should be 5–10 dB lower than in the daytime. Other time bases are recommended for schools, preschools and playgrounds, depending on activity.

The guideline values are summarised below:

Table 1: Guideline values for community noise in specific environments.

Specific environment	Critical health effect(s)	L _{Aeq} [dB(A)]	Time base [hours]	L _{Amax} fast [dB]
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, window open (outdoor values)	45	8	60
School class rooms & pre-schools, indoors	Speech intelligibility, disturbance of information extraction, message communication	35	during class	-
Pre-school bedrooms, indoor	Sleep disturbance	30	sleeping-time	45
School, playground outdoor	Annoyance (external source)	55	during play	-
Hospital, ward rooms, indoors	Sleep disturbance, night-time	30	8	40
	Sleep disturbance, daytime and evenings	30	16	-
Hospitals, treatment rooms, indoors	Interference with rest and recovery	#1		

Industrial, commercial shopping and traffic areas, indoors and outdoors	Hearing impairment	70	24	110
Ceremonies, festivals and entertainment events	Hearing impairment (patrons:<5 times/year)	100	4	110
Public addresses, indoors and outdoors	Hearing impairment	85	1	110
Music and other sounds through headphones/earphones	Hearing impairment (free-field value)	85 #4	1	110
Impulse sounds from toys, fireworks and firearms	Hearing impairment (adults)	-	-	140 #2
	Hearing impairment (children)	-	-	120 #2
Outdoors in parkland and conservations areas	Disruption of tranquillity	#3		

#1: As low as possible.

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

#3: Existing quiet outdoor areas should be preserved and the ratio of intruding noise to natural background sound should be kept low.

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

4.12 The values in the WHO table of most relevance to the HM6L are the 55dB(A) value for outdoor living areas and the 45dB(A) value for “outside bedrooms) designed to prevent sleep disturbance through nighttime noise

4.13 We have shown in table 3.9.1 that 832 residential properties that are in noise bands above 60dB(A) will experience an increase in noise. This underestimates total exposure to increased noise above 55dB(A) because we are not able to disaggregate the 50-60 dB(A) band in Table 12.4.3 into 50-55 and 55-60. Also we only have figures for the 300 metre distance band and not for WebTag recommended 600 metre distance band. We conclude that there is a serious underestimation of population numbers exposed as a result of this road to noise levels above the WHO critical value of 55dB(A).

4.14 It is not acceptable that as a result of deliberate public policy many hundreds and perhaps thousands of individuals should be exposed to noise levels that damage health

4.15 It is also contrary to public health policy and to sustainable development policy.

4.16 Key policy documents on sustainable development emphasise the importance to government of increasing quality of life:

What are sustainable communities?

Sustainable communities are places in which people want to live, now and in the future. They embody the principles of sustainable development at the local level. This means they improve quality of life for all whilst safeguarding the environment for future generations.

Source:

DEFRA (2006) Sustainable Communities

<http://www.sustainable-development.gov.uk/publications/documents/sustainable-communities-guide.pdf>

- 4.17 The HM6L is predicated on the acceptability of reducing the quality of life of many. Even on the proposers' own flawed figures about the impact of both air quality and noise many hundreds and perhaps thousands will experience worse air quality and a worse noise environment and a reduced quality of life including health damage. This is not acceptable and it is contrary to sustainable development policy
- 4.18 The policy theme is taken up in PPS1:

PLANNING FOR SUSTAINABLE DEVELOPMENT

Social Cohesion and Inclusion

14. The Government is committed to developing strong, vibrant and sustainable communities and to promoting community cohesion in both urban and rural areas. This means meeting the diverse needs of all people in existing and future communities, promoting personal well-being, social cohesion and inclusion and creating equal opportunity for all citizens.
15. Regeneration of the built environment alone cannot deal with poverty, inequality and social exclusion. These issues can only be addressed through the better integration of all strategies and programmes, partnership working and effective community involvement.
16. Development plans should promote development that creates socially inclusive communities, including suitable mixes of housing. Plan policies should:
 - ensure that the impact of development on the social fabric of communities is considered and taken into account;
 - seek to reduce social inequalities;
 - address accessibility (both in terms of location and physical access) for all members of the community to jobs, health, housing, education, shops, leisure and community facilities;
 - take into account the needs of all the community, including particular requirements relating to age, sex, ethnic background, religion, disability or income⁷;
 - deliver safe, healthy and attractive places to live; and,
 - support the promotion of health and well being by making provision for physical activity.

Source:

http://www.communities.gov.uk/pub/806/PlanningPolicyStatement1DeliveringSustainableDevelopment_id1143806.pdf

4.19 A project that imposes increased noise levels on an established community against a back ground of an evidence base showing that these noise levels contribute to health damage is in direct contradiction to policy objectives that include:

- Developing strong vibrant and sustainable communities
- Promoting personal well-being
- Taking into account the needs of all the community
- Deliver safe, healthy and attractive places in which live

4.20 In situations where there is already a known level of noise that is injurious to health it is perverse to impose a further deterioration in that noise level. The policy imperative must be to “do no harm” and to initiate policies that improve an already unacceptable situation and not make it worse. A trend of even minor proportions (e.g. an increase in noise of 1dB(A)) is 100% wrong because it is in the wrong direction. Trend to target is what matters and the target is to improve the health of the population and create “safe, healthy and attractive places to live”

4.21 PPS1 goes further in establishing the settled view of government on targets and objectives:

Protection and Enhancement of the Environment

17. The Government is committed to protecting and enhancing the quality of the natural and historic environment, in both rural and urban areas. Planning policies should seek to protect and enhance the quality, character and amenity value of the countryside and urban areas as a whole. A high level of protection should be given to most valued townscapes and landscapes, wildlife habitats and natural resources. Those with national and international designations should receive the highest level of protection.
18. The condition of our surroundings has a direct impact on the quality of life and the conservation and improvement of the natural and built environment brings social and economic benefit for local communities. Planning should seek to maintain and improve the local environment and help to mitigate the effects of declining environmental quality through positive policies on issues such as design, conservation and the provision of public space.

4.22 The HM6L is not contributing to these objectives in either rural or urban environments. It is damaging those environments. The HM6L does not “protect and enhance the quality, character and amenity value” of substantial areas in Torrisholme and Bare, or the

tranquil countryside designated as green belt between Lancaster and Morecambe.

- 4.23 PPS1 returns to the health theme which is inconsistent with a project that imposes additional noise and additional air quality burdens on the community:

- (iii) Promote communities which are inclusive, healthy, safe and crime free, whilst respecting the diverse needs of communities and the special needs of particular sectors of the community.

Source: 27 (iii) of PPS1

5 Nighttime Noise

- 5.1 WebTag guidance on traffic noise is clear on nighttime noise:

Furthermore, care is needed in assessing options which may result in adverse noise impacts during the night. Whilst traffic levels and their resultant noise impacts are lower at night than during the day - by about 10dB on roads - people tend to be more sensitive to night-time noise. As noise during the night (midnight to 6am) is not covered in the 18 hour measures used for assessing the annoyance impacts and monetary values of noise, any significant changes in night-time noise should be reported in the qualitative assessment column of the Appraisal Summary Table (AST).

Source:

http://www.webtag.org.uk/webdocuments/3_Expert/3_Environment_Objective/3.3.2.htm

- 5.2 Nighttime noise is not dealt with in section 12 of the ES. This is a serious omission especially as one of the stated aims of the HM6L is to provide a route for HGV traffic to the port of Heysham. It is a normal part of any port operation that HGV traffic will take place throughout a 24 hour period and there will be substantial flows of HGV traffic through residential areas during the hours when residents will be sleeping
- 5.3 Lorry noise is still a significant factor in the overall structure, volume and diurnal rhythm of urban noise and in spite of technological improvements to produce quieter lorries they are still very noisy. This has been identified as an issue in the Mayor of London's noise strategy and figured heavily in the original GLC lorry ban

5.4 Lorries are noisy as can be seen in this comparative table:

Table 9 Typical noise levels

Noise source/situation	Sound Pressure Level in dB(A)	Typical subjective description
30 m from military jet at take-off	140	Painful, intolerable
Pop concert, near stage	105	
Night club (typical locations within)	100	Extremely noisy
Pneumatic drill, at 7 m	95	
Powered lawnmower at operator's ear,		
Older diesel lorry from footway	90	Very noisy
Ringing alarm clock at 1m	80	
Car or light van at 60 km/h from 7m	75	

Source: Mayor of London (2004), Ambient Noise Strategy, page 226

http://www.london.gov.uk/mayor/strategies/noise/docs/noise_strategy_all.pdf

5.5 The actual noise levels to be experienced by residents in Torrisholme and Bare will depend on parameters that are not yet clear including any changes in anticipated traffic levels on links of the highway system as a result of the work of Professor Goodwin and any new information that may be made available during the course of the inquiry on the number and types and ages of lorries that will be using the HM6L during the day time and nighttime hours.

6 Data deficiencies

- 6.1 We are in some difficulty in discussing noise impacts because of the inadequacy of data. At the public inquiry into the Thames Gateway Bridge the following table of data was presented:

Table 17.2: Predicted Noise Impact

Free-field Road Traffic Noise Band (dB L _{A10,19h})	No. of Residential Properties	No. of People Bothered	No. of Residential Properties	No. of People Bothered
	Current Baseline		Future Baseline	
<50	1635	110	1883	113
50<60	592	99	653	109
60<70	49	20	32	13
≥70	0	0	0	0
TOTAL	2276	229	2568	235

Source: evidence to the Thames Gateway Bridge Public Inquiry

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May 2005

http://www.persona.uk.com/thamesgateway/proofs/objectors_proofs/McCarthy%20Health%20Impact%20July%202005.pdf

- 6.2 This table of data allows an assessment of project impact to take place and we need a similar table for the HM6L.
- 6.3 The table should be produced for day time noise and separately for nighttime noise
- 6.4 The table should be produced for the 300m and 600m distance bands option
- 6.5 The table should be produced in line with WebTag noise band recommendations (see para 3.1 above)

7 The emerging policy framework

- 7.1 Noise policy is changing. The European Environmental Noise Directive (2002/49/EC) has laid out a new policy direction that is based on mapping noise and then producing action plans to reduce noise:

Article 1

Objectives

1. The aim of this Directive shall be to define a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure

to environmental noise. To that end the following actions shall be implemented progressively:

- (a) the determination of exposure to environmental noise, through noise mapping, by methods of assessment common to the Member States;
- (b) ensuring that information on environmental noise and its effects is made available to the public;
- (c) adoption of action plans by the Member States, based upon noise-mapping results, with a view to preventing and reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and to preserving environmental noise quality where it is good.

Article 2

Scope

1. This Directive shall apply to environmental noise to which humans are exposed in particular in built-up areas, in public parks or other quiet areas in an agglomeration, in quiet areas in open country, near schools, hospitals and other noise-sensitive buildings and areas.

Article 4

Implementation and responsibilities

1. Member States shall designate at the appropriate levels the competent authorities and bodies responsible for implementing this Directive, including the authorities responsible for:

- (a) making and, where relevant, approving noise maps and action plans for agglomerations, major roads, major railways and major airports;
- (b) collecting noise maps and action plans.

(n) 'major road' shall mean a regional, national or international road, designated by the Member State, which has more than three million vehicle passages a year;

Article 7

Strategic noise mapping

1. Member States shall ensure that no later than 30 June 2007 strategic noise maps showing the situation in the preceding calendar year have been made and, where relevant, approved by the competent authorities, for all agglomerations with more than 250 000 inhabitants and for all major roads which have more than six million vehicle passages a year, major railways which have more than 60 000 train passages per year and major airports within their territories.

Article 8

Action plans

1. Member States shall ensure that no later than 18 July 2008 the competent authorities have drawn up action plans designed to manage, within their territories, noise issues and effects, including noise reduction if necessary for:

- (a) places near the major roads which have more than six million vehicle passages a year, major railways which have more than 60 000 train passages per year and major airports;

Article 14

Transposition

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive no later than 18 July 2004. They shall inform the Commission thereof.

Source: European Commission

http://europa.eu.int/eur-lex/pri/en/oj/dat/2002/l_189/l_18920020718en00120025.pdf

7.2 Given the detailed procedures now being put in place to systematise and measure noise and to steer public policy towards the reduction of noise it would be perverse to embark on a reckless adventure that will increase noise for substantial groups of people and will increase noise at the time of day when the result is most likely to damage the health, well-being and quality of life of local residents. The effect of pursuing this adventure will make it far more difficult to produce an effective action plan within the meaning of the EC directive (transposed into UK law) and this unnecessarily fetters all public administrations in the achievement of their obligations to protect and enhance health and reduce noise exposure

8 Conclusions

7.1 Noise is a serious health hazard. There should be a presumption against inflicting increases of noise on specific geographical populations unless there are very special circumstances that point without any doubt towards the existence of a need and the absence of other policies or measures that could achieve the same objectives without inflicting the additional noise. This has not been demonstrated in the case for this road

7.2 Noise has a disproportionately serious affect on vulnerable groups in society and these include:

- Those with particular diseases or medical problems e.g. high blood pressure
- People dealing with complex cognitive tasks (e.g. those who are visually impaired)
- Those with hearing impairment
- Babies and children
- The elderly

7.3 The case for the road has not identified those that might fall into these categories and has not taken any account of the fact that the health risks are a function of the size of the environmental problem (in this case noise) and the numbers of people affected by that problem and the distribution of vulnerable groups by exposure to different values of that problem.

7.4 Guidance on noise in WebTAG has not been followed. The noise bands used are different to those recommended in WebTag and the 600 metre distance band from the road has not been used. The likely

result of this departure is an under-estimate of population numbers exposed to noise levels higher than the WHO recommended limit values

- 7.5 Population exposure levels (also recommended by WebTag) have not been calculated or presented to the Inquiry.
- 7.6 Important information on noise levels with and without the scheme has not been put before the Inquiry. Para 12.4.10 of the ES explicitly dismisses the without comparison in contradiction to WebTag advice
- 7.7 Seven hundred and ten properties in the 60-70 dB (A) band (and an unknown number of people in vulnerable groups) are predicted to be exposed to noise increases when they are already exposed to noise levels that exceed WHO guidelines (see below) and a further 122 properties exposed to seriously high levels of noise are also to be exposed to predicted increases. The same upward lift of noise exposure is predicted to apply to 18 community facilities in the lower of these two bands and 12 in the higher. This is a serious departure from the norms of environmental protection and of sustainable development
- 7.8 We have shown in table 3.9.1 that 832 residential properties that are in noise bands above 60dB(A) will experience an increase in noise. This underestimates total exposure to increased noise above 55dB(A) because we are not able to disaggregate the 50-60 dB (A) band in Table 12.4.3 into 50-55 and 55-60. Also we only have figures for the 300 metre distance band and not for WebTag recommended 600 metre distance band. We conclude that there is a serious underestimation of population numbers exposed as a result of this road to noise levels above the WHO critical value of 55dB(A).
- 7.9 The HM6L is directly contrary to government policy on sustainable communities and to advice on sustainability in PPS1
- 7.10 A project that imposes increased noise levels on an established community against a back ground of an evidence base showing that these noise levels contribute to health damage is in direct contradiction to policy objectives that include:
- Developing strong vibrant and sustainable communities
 - Promoting personal well-being
 - Taking into account the needs of all the community
 - Deliver safe, healthy and attractive places in which live
- 7.11 Nighttime noise is damaging to human health and this is recognised by the WHO in setting its threshold value at 45dB(A) for “outside bedroom”. This has not been evaluated by the proposer and the likelihood is that given the frequent reference to HGV traffic servicing the port of Heysham, there will be additional nighttime noise that is damaging to human health. The recommendation in WebTag to be careful with nighttime noise has not been followed.
- 7.12 There is a serious data deficiency on noise in the case for the HM6L. Contrary to best practice we do not have before and after noise levels information in useful noise measurement bands.

- 7.13 The policy framework within noise is discussed and evaluated and within which interventions and measures are constructed is changing. European legislation, already transposed into UK legislation, requires detailed mapping and evaluation of noise and the production of a noise reduction plan. The HM6L unnecessarily fetters the ability of public bodies to produce interventions that will assist in delivering a healthy noise environment. It produces a significant source of additional noise that is close to a large residential environment. This counters the public policy intention and commitment to reduce noise exposure to levels recommended by the WHO which are those needed to protect human health
- 7.14 The HM6L will introduce noise levels into an area characterised by a large residential population, rural tranquillity and a significant institutional presence (the Lancaster and Morecambe College). It worsens the noise environment for a large number of people and it renders emerging public policy to create healthy noise environments difficult or impossible to achieve. On these grounds alone the road should be rejected