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LOCAL AUTHORITY TRAFFIC NOISE CRITERION - FROM THE SUBLIME TO THE RIDICULOUS

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INTRODUCTION

It is a general wish to improve peoples' environment and their quality of life. At the very least, such improvements should be directed to the home environment. I would suggest that market forces, of themselves, are insufficient guarantee that reasonable and improving environmental standards will be achieved in housing accommodation. Appropriate standards to the area in which they are to be used should therefore be imposed. I examine some of the standards that have used by Local Authorities and suggest that the large variation that occurs in these standards reduces the credibility of the argument for having them.

Noise Criterion

The standard definition of noise is that it is an unwanted sound. This definition is not particularly helpful as a judgement as to what sounds are considered acceptable and what are considered unwanted must be made. Each individual's tolerance of noise is very subjective and we have instances which would suggest that the tolerance of noise is dependent upon the respondants' understanding of the necessity of that noise. If he considers that the noise is unnecessary and something can be done to alleviate the noise, he will complain about it. If, on the other hand, he feels it is a necessary part of the environment he is less likely to complain.

For example, take industrial noise. Complaints can be received when the noise from the industry at night can be as little as 5dB(A) above the background noise, (L90). In quiet areas the industrial noise could be as low as 35dB(A) and still produce complaints. Conversely noise from road traffic is frequently above a level of 70dB(A) (about 15% of properties within the London conurbation suffer noise levels of this magnitude) and very few complaints are forthcoming. The philosophy, therefore, in setting a universal standard of acceptable noise levels is suspect. What is accepted as a necessary noise in one area may be considered entirely unnecessary in another.

Subjective Response To Noise

In 1972/73 a National Noise Survey was carried out in the U.K. The major result of this work was to determine the populations's exposure to noise for different types of area [1].

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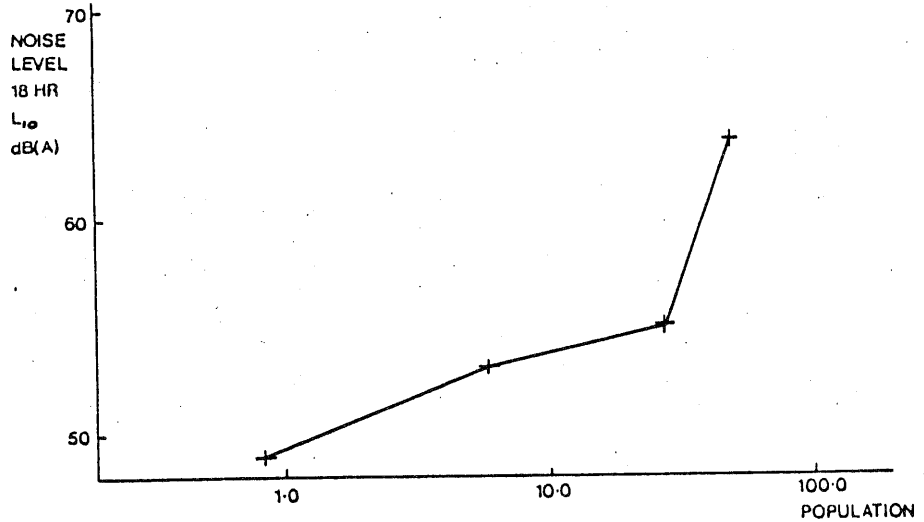

FIGURE VARIATION OF NOISE WITH POPULATION DENSITY

This data can be re-drawn for the 50 percentile distribution in terms of population density. This is given in the Figure, which shows that the average person in the various areas identified suffer traffic noise levels dependent on the population density of the area in which they are living. From the UK Building Societies Association Bulletin [2] we can show that the house prices increase as the density of population increases. The average property in London costs 71% more than the average property in the cheapest area. A deduction that can be drawn from this is that as the area becomes progressively noisier so value of property in this area increases.

This effect is contrary to the general expected norm that house prices decrease with noise. The data from Taylor, [3] Nelson, [4] etc., would suggest that as noise increases so the property value decreases at the rate of about ½% per dB(A) resulting in a maximum of a 10% change in value over the usual traffic noise range of from 55dB(A) to 75dB(A) 18 hour Leq. In some of our work [5], we have been unable to identify an equivalent relationship because of the difficulty in obtaining data for two comparable areas.

From the U.K. Family Expenditure Survey [6] we also note there is a differential in incomes from the lowest price region to the highest price region, but this is only some 31%. A deduction that can be made from the above is, that people living in the London conurbation suffer high noise levels but may not have

sufficient monies available to them to improve their environment, for example, by providing noise insulation. In consequence it can be asserted that people living in high priced areas tend to have reduced environmental standards. Confirmation of this can be seen from the Census data [7] in that the average occupancy of properties in the London conurbation area is higher than those in the more rural areas. The % of the population with a density of occupation of greater than 3 persons per 4 habitable rooms increases from 15% for sparsely populated areas to 30% for some areas of Central London. It can, therefore, be argued that with the increased commercial pressures there will be pressures on developers to provide less expensive housing which inevitably will lead to lesser environmental quality.

As part of the same National Noise Survey questions were asked as to people's response to traffic noise at their home, [8]. The results of this work are broadly that above 60dB(A) the proportion of people "seriously bothered" by noise rises quickly above the 10% level. Also, there is a certain levelling off of disturbance above a level of 70dB(A). One can argue, that above 70dB(A), the less sensitive people tend to inhabit properties with this noise environment. It should be noted, that the proportion of people "at least bothered" does seem to rise continuously. A conclusion that can be drawn from the above analysis is that bother due to traffic noise occurs at all levels of noise and that there is no simple and easy cut-off for the acceptability of any particular noise level.

The additional cost of building a property that has been designed against noise can be small. However, the cost in taking remedial action with regards to the design of a building is quite large. In the U.K. it is assessed that the cost of providing a good acoustic environment in the design stage can be as low as £200 per house, yet the cost of providing remedial noise insulation for that house can be as high as £1,000. It is then more cost effective to set standards, rather than to rely on remedial action by those people who consider themselves seriously affected.

Local Authorities Traffic Noise Standards

In the U.K. noise standards for new development are set by the Local Authorities and these vary from one to another. I give two examples of Local Authorities whose standards in this respect are questionable.

First, the sublime, or is it the ridiculous. "Development should not be permitted if the 18 hour L_{10} noise level at the facade of the dwelling in the design year exceeds 60dB(A).

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What does this mean in practice?

i Because of the uncertainty in traffic growth forecasts, the increase in traffic may or may not occur. Also, over the past 10 years despite the increase in traffic flow and speed, our data would indicate that there has not been a commensurate increase in traffic noise levels. There is some indication that road traffic noise levels have fallen. It is my contention that this reduction in noise is likely to continue with the advent of new vehicles, for example the British Leyland truck which is some 6dB(A) quieter than its counterpart of a few years ago. If we take into account traffic growth and the fact that the predictor (CRTN appears to overpredict by 1dB(A)), then this unacceptable level of 60dB(A) is in essence an existing noise level of 57 dB(A) which is not in fact, likely to increase.

ii In this particular case, as part of the scheme, there is to be a 100 metre strip of landscaping in the form of dense planting. CRTN does not allow for this as it could be a temporary provision. However, this planting is an integral part of the scheme and a minimum of a further 2dB(A) could be subtracted from the likely noise level. In all probability the external noise level will be in the order of 55dB(A).

iii Sarjeant's [9] work on attenuation of windows has shown that the average window attentuation of 100 properties is in the order of 29dB(A). These new properties to which the standard applies are to be built to the latest British Standards of thermal insulation (which requires smaller windows, better thermal insulation and consequentially better acoustic attenuation). It is therefore likely that the wall, window attenuation of a new dwelling would be better than the value of 32dB(A).

This leads us to the conclusion that the internal noise level in these properties will be of the order of 23dB(A). This level, according to the L.A. is unacceptable and additional acoustic insulation is required which would bring the internal noise level down to a level of 15dB(A), which I would suggest is in the region of sensory deprivation.

The second case, ridiculous or is it sublime, occurred on one of the major traffic roads in the centre of London. A number of properties have been used for offices on this road in contravention of the Local Plan. Enforcement notices have been served on the owners of these properties to convert them back to residential accommodation. The Local Authority were quite prepared to accept that these buildings should be utilised as residential accommodation even though the noise level at 2 a.m. in a room that could only be used as a bedroom was 52dB(A). It was

interesting to note that the window of this room was already double glazed albeit not to a high standard.

The comparison between the two standards is difficult to accept. I would suggest that no arguments regarding the various criterion surrounding these areas could possibly justify such huge differences between these standards. An unacceptable daytime level of 23dB(A) and a poor but not unacceptable night-time level of 52dB(A) is difficult to rationalise. Especially as data from the national noise survey would indicate that the dose response relationships between noise and disturbance does not differ between the noisy areas of London and the quiet of the countryside.

Conclusion

There is an argument for the provision of traffic noise standards, however, I would argue that at the present time the variation in these standards is so great as to make them non-credible.

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