Proceedings of The Institute of Acoustics

A METHODICAL APPROACH TO NOISE NUISANCE FROM ENTERTAINMENT AND RECREATION

D. Christie and J. Hinton

Birmingham City Environmental Services Department

ABSTRACT

Few standards exist for assessing the acceptability or otherwise of noise from entertainment or recreation events. Local authority officers, nevertheless, have to make decisions and give advice on such matters. It is essential that this is done as objectively as possible, using some rational basis. This paper describes a general procedure which has been used for the production of guidelines for a number of entertainment, recreation and other noise sources. Some of the difficulties in this approach are highlighted and an example of draft guidelines produced for noise from musical entertainment is discussed briefly.

INTRODUCTION

Most local authorities have officers within their Environmental Health Departments who have some special training or expertise in noise control. They are looked to to advise on a wide range of noise-producing activities. The questions they are asked are usually very simple, for example, "will this produce an actionable nuisance?" or "will noise from this event be acceptable?" Unfortunately, officers usually have insufficient information available to them to be able to give simple yes or no answers and, in any case, yes or no answers are inappropriate, since what may be "acceptable" to one group of people may not be to another. In answering the simple questions in a manner which is scientifically correct, officers are often thought to be indecisive or evasive. There is still a widely held belief amongst the public at large that any noise can be assessed almost instantly with a hand-held meter and an answer given as to whether or not it is above the "legal limit".

Whilst Councillors and Magistrates are usually aware that the assessment of noise is not quite so simple, they still expect officers to be clear and unambiguous in their views. Perhaps of most importance is that the views expressed are formulated on a consistent basis. If a complaint is made to the Ombudsman, he will generally be willing to accept that people may disagree with a decision which has been made, but he will not find against the local authority, provided the decision has been made on a consistent and logical basis [Ref.1]. In the entertainment and recreation noise field, it is not uncommon for the views of officers to be challenged, either by organisers who feel the local authority is "killing their sport" or by people adversely affected who will say the controls are insufficiently strict.

BASIS FOR PROVIDING GUIDANCE

In recent years, the Environmental Services Department in Birmingham has had an involvement with a wide selection of recreational or entertainment noise issues. These have included:-

- the landing of a Harrier Jump Jet in the car park of a T.V. studio in a residential area;
- open air pop concerts and discotheques in public parks;
- American football
- BMX racing;
- a festival of marching bands;
- speedway racing;
- funfairs;
- motor-racing:
- pop concerts in a football stadium

With noise from the typical sources described above, there are three areas where the Environmental Services Department may be involved:-

(1) to decide whether noise amounting to a nuisance is likely to arise which would involve a duty to act under Section 58 of the Control of Pollution Act 1974;

(2) if planning permission is required, to advise the Planning Committee appropriately, bearing in mind that the objective is to ensure a desirable environment, rather than a situation which is just short of a statutory nuisance;

(3) to advise the Licensing Sub-Committee in respect of entertainment licences, with particular regard to "preventing persons in the neighbourhood being unreasonably disturbed by noise". [Ref.2].

The technique used for establishing criteria is based on common-sense and is unlikely to be unique to Birmingham. It is shown diagramatically in Fig.1. The first step in this rational approach is to attempt to quantify the potential problem. This follows Lord Rayleigh's philosophy that "little is known about a topic until it can be described in numbers". As well as noise level information, it is also necessary to find out how often the proposed event will occur and for what period of time the noise will be on. Will the disturbance be caused during the daytime, night-time or on Sundays? Appropriate allowances can be made for screening and distance effects. Once an estimate of the likely noise levels at sensitive buildings has been produced, the impact has to be assessed.

Where criteria have already been established, perhaps by another local authority, a first estimate of the impact can be produced. The guidelines for pop concerts proposed by the G.L.C. have proved to be very useful in this respect. [Ref.3].

A METHODICAL APPROACH TO NOISE NUISANCE FROM ENTERTAINMENT AND RECREATION

In some cases, it is not possible to find in the literature proposed guidelines which can be used as a standard. Some time ago, this was the case with open air pop concerts. Currently, there is also relatively little data on marching bands or amplified p.a. systems at BMX races etc. In such situations, some success has been achieved by synthesising criteria. In essence, this means calculating noise levels within buildings and viewing these in relation to standards which are generally accepted for such environments. Speech interference level (SIL) has proved to be a particularly useful index, as also have NC and NR levels [Ref.4]. Using speech interference level data, it is possible to categorise noise-sensitive buildings into those where the interfering noise would (a) prevent normal domestic activities such as watching television; (b) intefere with such domestic activities (TV or radio sound would have to be turned up above normal listening levels) or (c) normal daytime domestic activities would be only slightly affected. Providing a marked-up map with noise- sensitive buildings shown in this way is an effective method of demonstrating the degree of noise intrusion to a non-technical audience.

Once the noise levels have been predicted and some criteria chosen, it is then possible to formulate tentative guidelines applicable to the particular sport or entertainment being considered. The exercise of producing written guidelines is useful and, in its way, is an extension of Lord Rayleigh's thoughts on providing a scientific description in terms of numbers - can a policy be consistent and logical if it cannot pass the test of being written down?

Once guidelines, however tentative, are produced, their operation can then be examined in the "real situation". This is where monitoring comes in at pop concerts etc. Experience gained when the event proper takes place is assessed on the basis of the scientific, objective, acoustic data produced, the subjective views of the officers involved in the assessment and by interpreting carefully any reaction on the part of people who might be adversely affected. These three areas of experience can then be fed back and compared with the tentative guidelines, allowing them to be consolidated, modified or expanded as seems necessary.

Guidelines conceived using this approach may well be modified radically during their evolution, but the more often they are applied in real situations and appropriately modified, the more reliable they become. The guidelines, of course, refer to particular types of activity. Guidelines produced for speedway racing will be different to those for pop concerts and might bear no resemblance to those proposed for sports such as shooting, where the character of the noise would be completely different.

A METHODICAL APPROACH TO NOISE NUISANCE FROM ENTERTAINMENT AND RECREATION

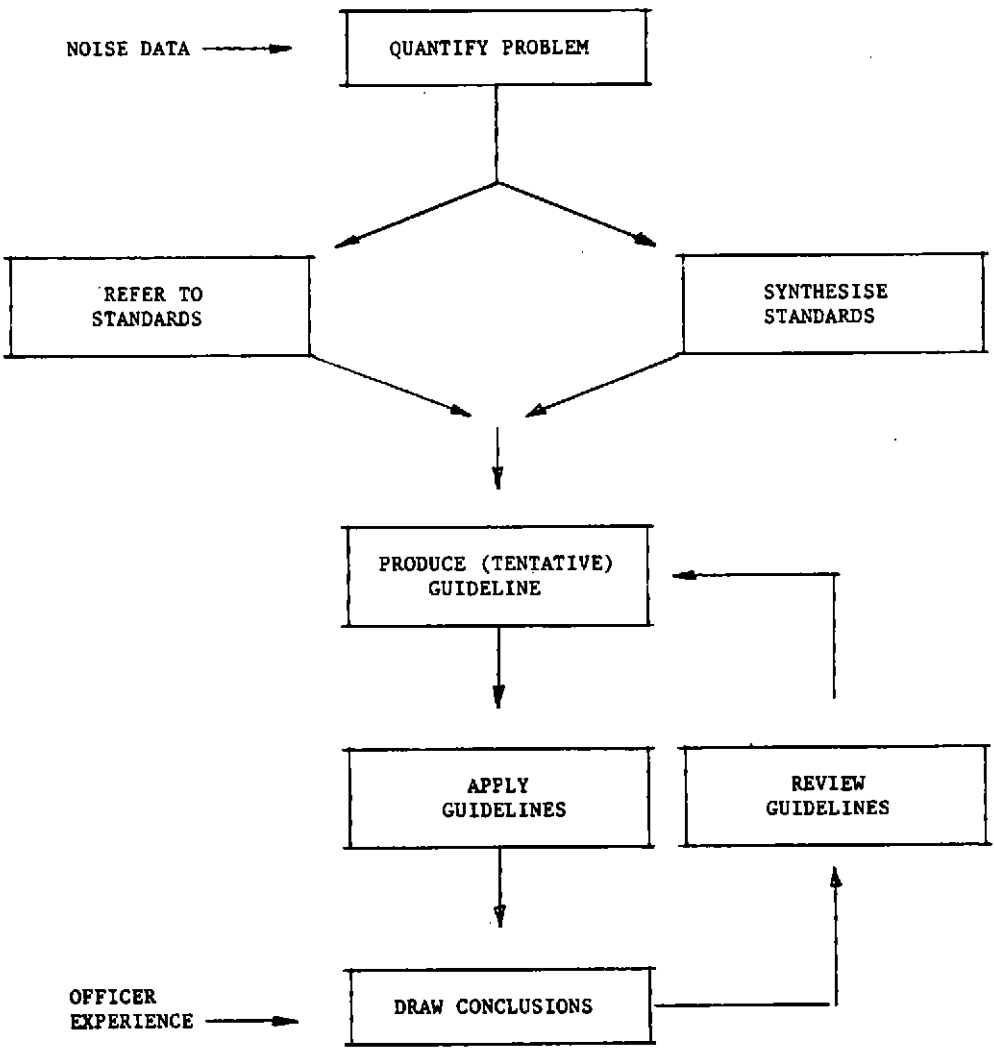

Figure: 1

A METHODICAL APPROACH TO NOISE NUISANCE FROM ENTERTAINMENT AND RECREATION

ACHIEVING A BALANCE

In effect, guidelines represent the compromise between the ideal of no noise disturbance and what can reasonably be achieved because of practical considerations. A standard viewed as too restrictive by the promoter of an entertainment may, at the same time, be regarded as too permissive by someone experiencing the noise at home. It is usually possible to generate some objective data to assist in making judgements as to acceptability, but the data needs interpretation and, inevitably, the process depends to some extent on officer experience. In Birmingham, some officers deal with as many as 300 noise complaints a year. Other local authorities deal with a similar workload. Through this work, they achieve an insight into the circumstances which lead to complaints or adverse reaction. Notionally, it is expected that there will be a dose/response relationship for entertainment noise which might possibly take the Gausian distribution as shown in Fig.2. This would be consistent with officer experience, which indicates that occasionally people will be very annoyed by the most minor of nuisances while, at the other extreme, some individuals will be relatively unaffected by noise which the majority of the population would regard as intolerable. If such curves could be drawn up for particular types of entertainment noise, then a simple index of acceptability could be produced on the basis of say 5% or 10% of the public registering significant annoyance. Fields & Walker have been able to carry out studies into the effects of railway noise using annoyance ratings [Ref.5], but these studies have required a large exposed population for the results to be statistically significant. For entertainment and recreation noise, the effects of noise are much more localised and specific to the type of activity and venue. As a result, the direct questionnaire approach to assess the reaction of the public will often not produce results which are easy to interpret. While it may be dubious from the point of view of a statistician, the incidence of complaint or other overt adverse reaction following an event probably provides the clearest indication of the success or failure of tentative guidelines produced by the local authority. It is particularly useful to quote to Committees simply the number of complaints received the last time a particular event took place. Examination of specific complaints can also yield direct information for adjusting the guidelines. For example, with a musical entertainment, the finishing time has proven to be an especially important feature.

A METHODICAL APPROACH TO NOISE NUISANCE FROM ENTERTAINMENT AND RECREATION

DRAFT GUIDELINES FOR THE CONTROL OF NOISE FROM AMPLIFIED MUSIC

These guidelines should be regarded as the minimum that is required in terms of noise control. Desirable noise levels are lower.

(1) Overriding limit

No amplified music from any event should be audible within a dwelling (windows open) between 2300 and 1400 hours the next day or at any time on a Sunday.

(2) Events on consecutive days or on three or more occasions per week

No amplified music audible in a dwelling (windows open) between 2000 and 2300 hours. Between 1400 and 2000 hours, the ambient L_{eq} level should not be increased in any fifteen-minute period. The L_{eq} level to be measured one metre outside any facade of the most affected dwelling.

(3) Fortnightly, weekly and twice weekly (not on consecutive days) events

No amplified music from any event should be audible within a dwelling (windows closed) between 2000 and 2300 hours. Between 1400 and 2000 hours, the ambient L_{eq} level should not be increased by more than 3 dB(A) in any fifteen-minute period. The L_{eq} level to be measured one metre outside any facade of the most affected dwelling.

(4) Events less than once a fortnight, but more than six a year

Between 2000 and 2300 hours, the ambient L_{eq} should not be increased by more than 3 dB(A) in any fifteen-minute period. Between 1400 and 2000 hours, the ambient L_{eq} should not be increased by more than 6 dB(A) in any fifteen-minute period. The L_{eq} levels to be measured one metre outside any facade of the most affected dwelling.

(5) Up to and including six events a year

Between 2000 and 2300 hours, the ambient L_{eq} should not be increased by more than 6 dB(A) in any fifteen-minute period. Between 1400 and 2000 hours, the ambient L_{eq} should not be increased by more than 10 dB(A) in any fifteen-minute period. The L_{eq} levels to be measured one metre outside any facade of the most affected dwelling.

TABLE 1

A METHODICAL APPROACH TO NOISE NUISANCE FROM ENTERTAINMENT AND RECREATION

EXAMPLE GUIDELINES

Table 1 shows a draft version of guidelines which are being developed in Birmingham for the control of noise from amplified music. These take into account the level of noise (based on 15-minute L_{eq} measurements), the time of day, day of the week and how often the disturbance will occur. The draft guidelines are presented here by way of an example only and they will no doubt be modified as experience has been gained in the future. They have, however, been applied for the last four years in the City and, at the very least, provide a useful benchmark. It has been noticed that the incidence of complaints has been reduced in areas where the guidelines have been used. To some extent, this must be because the level of noise has been decreased. There is probably another factor, in that the complainants know that the local authority is taking an active interest and is being seen to monitor and control disturbance on their behalf. They are reassured to know that their interests are being taken into account and that the "legal limit" they assume must exist and which was referred to earlier in this paper is not being exceeded.

The views expressed are those of the officers preparing this paper and not necessarily those of Birmingham City Environmental Services Department.

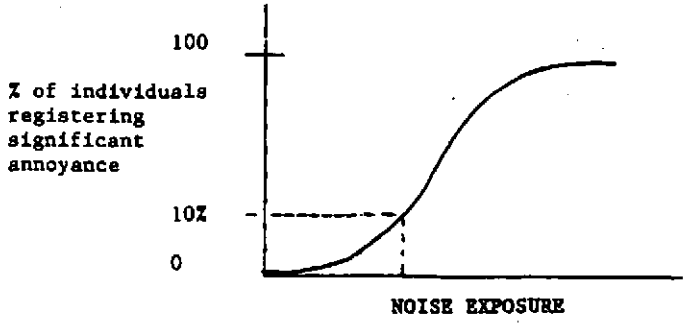

Figure: 2

A METHODICAL APPROACH TO NOISE NUISANCE FROM ENTERTAINMENT AND RECREATION

References:

[1] Your Local Ombudsman - Commission for Local Administration and Central Office of Information, 1979

[2] Local Government (Miscellaneous Provisions) Act, 1982 - Schedule 2, Section 4

[3] G.L.C. Code of Practice - Noise from open air pop concerts

[4] Sharland - Wood's Practical Guide to Noise Control, Chapter 2

[5] Fields & Walker, 1980 : ISVR Technical Report 102 - Reactions to railway noise : A survey near railway lines in Great Britain