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NOISE MAPPING - AN EFFECTIVE WAY OF COMMUNICATING INFORMATION TO THE PUBLIC?

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ABSTRACT

Mapping information that is likely to be produced across Member States as a result of recent European Commission proposals. These proposals are for a European Parliament and Council Directive on the approximation of the laws of Member States relating to the Assessment and Reduction of Environmental Noise Exposure. The groups in question are: (i) Decision makers e.g. politicians and their advisors, (ii) Scientists technicians and development planners, who will use the information to develop action plans for noise control and noise reduction, (iii) The general public, who, according to the Aarhus Convention, shall be given access upon request to all information relevant to decision making procedures free of charge and as soon as it becomes available. With regards to the Aarhus Convention it is apparent that the European Commission would like to go one stage further and require Members States to routinely publish noise map data to promote public debate on environmental noise issues. This paper will examine the various ways that noise mapping information could be presented to the public and the possible reactions that this could provoke.

1 - INTRODUCTION

Current European Commission (EC) proposals for a Directive relating to the Assessment and Management of Environmental Noise Exposure are likely to lead to the production of noise mapping data across European Union Member States. There are three main groups who would appear to benefit most from the production of such data:

1. The decision makers e.g. politicians and their advisors;
2. The scientists, technicians, development planners and economists, who will use the information to draft action plans for noise control and noise reduction;
3. The general public who, according to Article 9 of the latest draft version of the Directive (Ref. [1]), shall have access to noise maps and be involved in consultation leading to approved action plans for noise management.

If this EC initiative is to be successful the publication of noise map data must stimulate public debate about how environmental noise issues should be addressed.

This paper summarises the EC proposals, considers the existing methods of presenting information on environmental noise pollution to the public in the United Kingdom, and examines the various ways that noise mapping information could be presented to this user group.

2 - SUMMARY OF EC PROPOSALS FOR A DIRECTIVE ON ENVIRONMENTAL NOISE

In the Green Paper of 1996 (Ref. [2]) the EC estimated that between 17% and 22% of the population of the EU suffered from environmental noise levels it considered "unacceptable" (day time levels greater than 65 dB L_{Aeq}). It was also claimed that 90% of this problem was caused by road traffic.

It is against this background that the Commission is moving towards action on noise in the community. At the time of preparing this paper (April 2000) it appears that the Commission hopes to issue a proposed

Directive on Environmental Noise in September 2000. All drafts of this document, developed over the last two years, indicate that the production of noise mapping information will figure highly in the final proposal.

The Commission's strategy towards tackling the problems caused by transport and industrial noise in Europe through a Directive is outlined in figure 1.

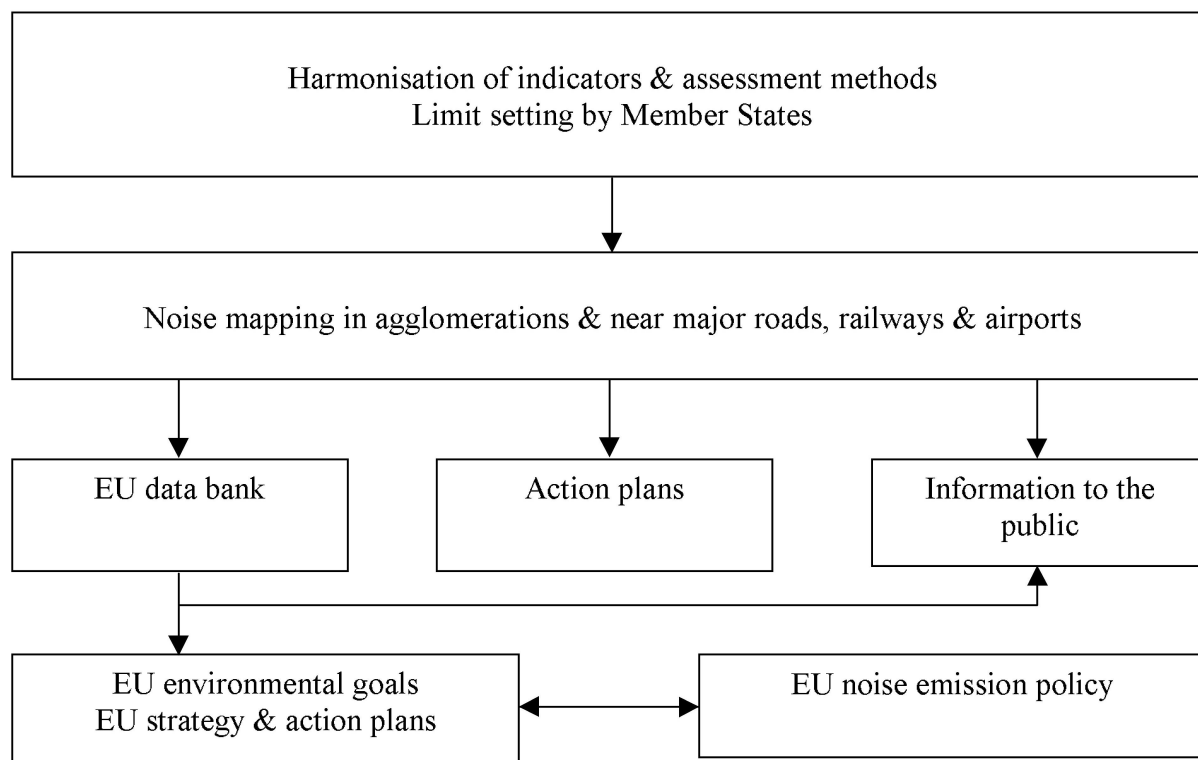


Figure 1.

According to the latest draft version of the proposed Directive (Ref. [1]) Member States will be required to adopt the measures necessary to ensure that 'competent authorities' produce the noise mapping data and noise maps referred to in figure 1. For agglomerations with more than 250,000 inhabitants, and for all major roads, railways and airports, these tasks should be completed within 3 years of the Directive coming into force (Article 7 of the latest draft). The 'competent authorities' will then be required to complete and approve action plans for noise reduction within a further year (Article 8 of the latest draft). For smaller agglomerations, but with more than 100,000 inhabitants, mapping should be completed within 8 years of the Directive coming into force. Similarly action plans for noise reduction will have to be completed and approved within a further year.

In addition Member States will also be required to ensure that the noise mapping information is used for two other purposes. Firstly to provide a basis for the data to be sent to the EU data bank (Article 10(2) and Annex VI of the latest draft). Secondly to provide a source of information for the citizen (Article 9 of the latest draft).

3 - UK NOISE POLLUTION AND PUBLIC INFORMATION – THE CURRENT SITUATION

In the UK noise mapping is in its infancy. Until recently most mapping has been confined to the production of noise contours around airports to determine eligibility for sound insulation grants, for future planning purposes and for year on year comparisons. Consequently little information on the general state of the noise environment in the UK, either locally or nationally, has been made available to the public at large.

The limited information that is available comes from local authority annual reports on the number of noise complaints these authorities receive from the members of the public living in their area. This data is produced primarily for the benefit of resource managers and local politicians. The Chartered Institute of Environmental Health collates the figures from individual local authorities across the country

to produce national statistics (Ref. [3]). However, for several reasons it is generally accepted that these statistics do not reflect the true levels of public dissatisfaction with environmental noise levels.

Additional information has been generated from a number of UK Government commissioned research projects concerning the effects of environmental noise on the public, most notably a Noise Incidence Survey (Ref. [4]) and a Noise Attitude Survey (Ref. [5]) which were conducted between 1989 and 1991. The government has used the results from these surveys, along with complaint statistics, to assist them in developing noise policy. However, the results of these surveys have not been widely publicised. Both studies are currently being repeated. It is to be hoped that on this occasion the results will be given wider publicity.

From the preceding comments it would be reasonable to conclude that historically no real effort has been made to raise public awareness concerning the levels of environmental noise in the UK. Indeed it would be fair to say that, up until recently, neither central government nor local government has been particularly pro-active in generating and publishing data that could have this effect.

Most work to raise public awareness of noise has been carried out by non-governmental organisations and in particular the National Society for Clean Air and Environmental Protection (Ref. [6]). This organisation is funded by the Department of the Environment, Transport and the Regions (DETR) to encourage action to reduce the impact of noise on the quality of life.

However, policies and attitudes, particularly at central government level are being re-evaluated. A clear indication that this process is taking place is DETR's support for a recent Birmingham City Council initiative which, through the use of sophisticated noise mapping software, has resulted in the production of physical noise maps of the entire City of Birmingham.

A full description of Birmingham's project is provided in a report that was commissioned and published by the DETR (Ref. [7]). This report can be found on their web-site (Ref. [8]).

The project was the subject of 5 seminars held across the UK that were mainly targeted at 'noise professionals'. However, these seminars generated considerable media interest and through this process basic information about the exercise has been presented to a significant proportion of the general public particularly in the Birmingham area.

Furthermore, Birmingham City Council has attempted to disseminate information about the project to the public through the City's normal local meetings programme. The authority also has plans to make a complete full-scale set of the maps available to the public at the City's Central Library. It is still early days, but the initial response from the public has been very positive.

4 - NOISE MAPPING DATA – OPTIONS FOR PRESENTATION

Noise mapping is the calculation (or in some cases measurement) and subsequent presentation of noise data on a previous, existing or predicted noise climate at a local, regional or national level.

To use noise mapping information for the all the purposes identified in the EC's proposals will mean that various methods of producing and then presenting this data will have to be employed.

Such information can be produced in the form of:

- Sound immission levels outside buildings or at grid positions in terms of a specific noise indicator (e.g. L_{den} and L_{night});
- The levels of 'exceedance' of a specific value of a noise indicator outside buildings or at grid positions (so-called 'conflict' mapping data);
- The change in value of a noise indicator outside buildings or at grid positions due to a specific action or actions and/or the change over a period of time (so-called 'difference' mapping);
- The number of people living in dwellings exposed to various values of a noise indicator or an effects indicator in a given area;
- The change in number of people living in dwellings exposed to various values of a noise indicator or an effects indicator in a given area due to specific actions or actions and/or the change over a period of time (another form of 'difference' mapping).

Such information can be presented in the form of:

- Graphical plots (physical maps) and/or;
- Numerical data in tables.

5 - NOISE MAPPING DATA FOR EFFECTIVE PUBLIC COMMUNICATION

The purpose of presenting the public with information in the form of noise maps or data derived from noise maps is not merely to provide citizens with data about noise pollution. It is also to encourage them to participate in an informed debate on the subject of environmental noise, the effects of this noise and when and how to employ cost-effective methods to reduce and control such noise.

Experience in some European countries, where noise maps have been produced for a number of years, suggests that this is not necessarily a straightforward process. The publication of noise mapping data inevitably raises public expectations of noise reduction but, in many instances, such events have not resulted in the development and implementation of effective action plans to achieve noise reduction. As a result public anticipation of noise reduction has quickly turned into public frustration both with local and national administrations.

It is reassuring that the EC's proposals for a Directive indicate that, once noise mapping information has been published, action plans for noise reduction must be publicly debated, approved and published within a year.

However, the publication of noise mapping information may cause some additional problems. For example, homeowners may resent the public availability of such information if their property is shown to be in an unacceptably high noise band. It may be possible to prevent most resentment simply by publishing noise reduction action plans as quickly as possible (as proposed by the EC) to show that these unacceptable noise levels can and will be reduced. However, there will be some situations where there is no prospect of achieving significant noise reduction in the immediate future. The resentment that this could cause may be particularly intense if noise 'effects' maps were made public as the relationships between physical noise levels outside buildings and the subjective response of those living inside these buildings is still an issue of much debate and disagreement.

In order to avoid significant levels of adverse reaction when publishing noise mapping information and to encourage active public participation in the development of action plans, it is suggested that, for the presentation of noise mapping data to the public, the following approach may be appropriate.

The initial information provided by the 'competent authority' to the public living in agglomerations and adjacent to major roads, railways and airports should be in the form of separate sound immission contour maps and/or sound immission level maps for each source i.e. roads, railways, aircraft and possibly some industries. This will allow individuals to identify the sound immission levels at their properties in terms of a physical noise indicator i.e. L_{den} and L_{night} . When this data is published it should be accompanied by a table showing the number of properties exposed to the various bands of noise in the mapped area and/or the number of people living in these properties and the Member State's limit values for environmental noise exposure. These limit values should be based on the 'effects' of exposure to different sources of environmental noise.

Shortly after this event the 'competent authority' should publish a number of action plan options with physical 'difference' maps showing the changes in noise that would occur with the implementation of each option. Information on the costs and benefits of the various noise reduction options should also be provided so that informed public debate is possible before a final action plan is approved.

The above process is depicted in figure 2.

6 - CONCLUSIONS

The production of noise mapping data across Europe will not, in itself, reduce noise and improve the quality of life for those citizens who live in areas where the environmental noise levels are unacceptably high or undesirably high.

However, experience in the UK with air quality data, contaminated land data, crime statistics and health statistics suggest that as long as noise mapping data is presented to the public in a suitable form, this should provide the impetus for future effective action for noise reduction.

Any views or opinions expressed in this paper are those of the authors and not necessarily those of Birmingham City Council.

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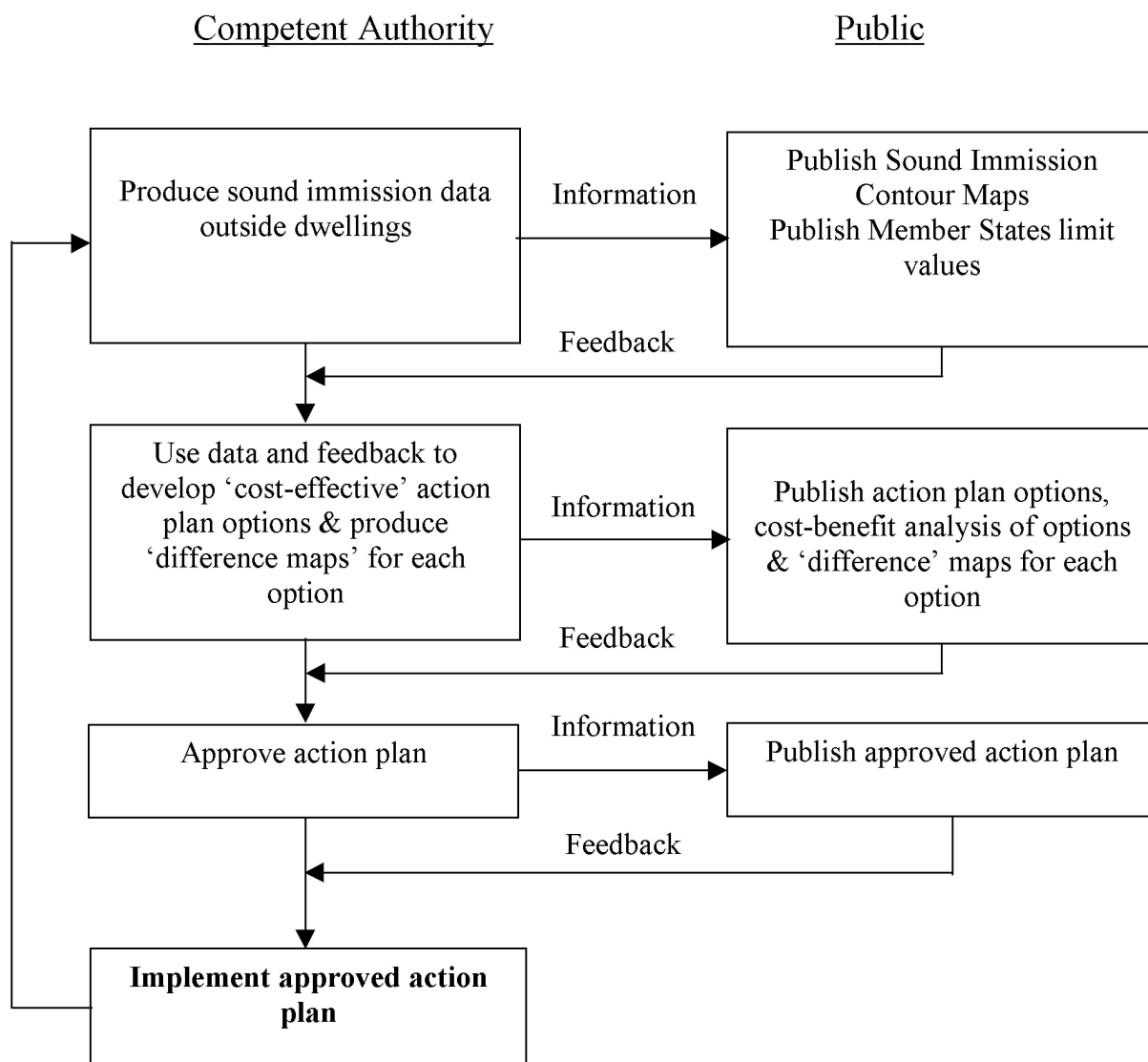


Figure 2.

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