



THE NETWORK
OF MAJOR
EUROPEAN
CITIES

Evaluation of the Environmental Noise Directive

Report by EUROCITIES Working
Group Noise

EUROCITIES

EUROCITIES is the network of major European cities. Founded in 1986, the network brings together the local governments of over 130 large cities in some 34 European countries. EUROCITIES represents the interests of its members and engages in dialogue with the European institutions across a wide range of policy areas affecting cities. These include: economic development, the environment, transport and mobility, social affairs, culture, the information and knowledge society, and services of general interest.

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BACKGROUND

EUROCITIES' Working Group Noise (WGN) has drafted this paper in order to give input to the European Commission's review of the Environmental Noise Directive (END)(2002/49/EC). The aim of this paper is to improve the quality and the effectiveness of the END. More detail is set out in the accompanying Technical Annex.

The objectives of the END are:

1. *"... 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."*
2. *"... to provide a sound basis for developing community measures to reduce noise emitted by the major noise sources, in particular road and rail vehicles, infrastructure, aircrafts, outdoor and industrial equipment and mobile machinery..."*

To achieve these objectives, the END provides for noise measurement and mapping, public information, and the adoption of noise action plans.

EVALUATION

The END has brought real benefits. It is thanks to noise mapping that we know the extent of urban populations exposed to noise. The common indicators used in all noise maps have enabled the comparison of the noise burden between Member States. And lastly every competent body has drafted or is still drafting a noise action plan. These are significant successes.

However the noise maps themselves and the extent of exposed populations remain incomparable. There is as yet no common method for noise modelling, there are inaccuracies in translation of the END into the Member States' languages and there remain incomplete and missing definitions in the END itself. Furthermore traffic noise modelling depends on the input of road and traffic data, and where as in many cases the data were poor, assumptions were made in order to complete noise maps.

The Good Practice Guide on Noise Mapping (GPG), containing a toolkit to overcome those deficits, has not been sufficiently disseminated. It should be updated with recent insights and experiences and made available in all languages.

Despite the completion of noise action plans the numbers of exposed people in Europe stands to increase rather than reduce in the next decades. There has been insufficient public engagement during the process of noise mapping and action planning, and plans often lack effective (SMART¹) measurement criteria. In any event local actions alone are rarely sufficient; although vehicles, trains, tyres, aeroplanes and other equipment must comply with European noise legislation, this is not enforced strictly enough. Indeed, a significant impact could be achieved by encouraging quieter transport, including hybrid cars and electric cars, public transport, cycling and walking.

¹ SMART: Specific, Measurable, Acceptable, Realistic and Time bounded

RECOMMENDATIONS

EUROCITIES Working Group Noise calls upon the European Commission and the Member States to act on the following recommendations (in **bold text**). Each recommendation carries a brief explanation; more information can be found in the Technical Annex.

Recommendation 1

For the first round of noise mapping in many cities no data infrastructure existed or data was not accessible in the necessary form. As a result, it took a lot of time, effort and expense to put the appropriate data infrastructures in place. In many cases data collection was based on a one-off action which suggests that similar problems will continue to exist in the second round of noise mapping. As a consequence many Member States may well find the timetable too tight.

The Commission should closely monitor the second round of noise mapping in 2012 in order be able to effectively address issues concerning data collection and data infrastructure in following rounds.

Recommendation 2

The END lays down a system of assessment (noise maps) and action to mitigate unacceptable or undesirable situations caused by developments in the past. In most action plans there is no focus on avoiding future developments that may lead to undesirable situations, even though ANNEX IV of the END suggests that 'different maps' could be made to show the difference between the existing situation and the future situation, i.e. after execution of the action plan.

Noise maps should be prepared not only for the present situation and the situation after the execution of action plans, but also to take into account likely future developments. By mitigating the harmful effects of such developments, action planning could become a more pro-active instrument for managing the acoustic urban environment.

Recommendation 3

In the Green Paper on Future Noise it is suggested that cumulative maps should also be produced but this option is not included in the END. A cumulative or combined map could give more insight in the total numbers of exposed people and could be helpful for policy making, priority setting and monitoring the overall acoustic climate in a city or agglomeration.

Cumulative maps should be integrated into the END, based on clear guidelines for adding up noise from different sources.

Recommendation 4

To deal with cross border issues at an early stage it is necessary to produce compatible data and maps. It is apparent that problems have occurred with incompatible data and different timescales, languages and methods. As a consequence in border areas the public is confronted with different noise maps (colours, details, geography etc) which are hard, if not impossible, for them to compare and understand.

Cross-border coordination with regard to noise mapping should be strengthened.

Recommendation 5

Military sites are excluded from the END. This can give a wrong impression of the real situation as military activities often cause a lot of noise and annoyance (e.g. the AWACS in the border areas of Germany and The Netherlands are responsible for a great number of noise complaints).

Noise contours should be presented by the Ministries of Defence but to protect national security, this should not be accompanied by further information about the noise sources and their locations.

Recommendation 6

There is considerable confusion about the status of action plans. An action plan should not merely be a policy statement. It should comprise a set of 'SMART' objectives, together with the measures and timescales to achieve them. A good action plan allows both politicians and the public to compare the anticipated reduction in noise and the final result and offers a framework for a revision of policies if needed.

The revision of the END should clarify the need for 'SMART' action plans.

Recommendation 7

The need for more target oriented provisions in the END is further supported by recent insights of the World Health Organisation, which indicate clear adverse physiological effects of noise. Research shows that a substantial percentage of people will experience serious annoyance at L_{den} levels of 42 dB and above.

The next round of noise mapping should start at an L_{DEN} of 40 dB and 35 dB L_{NIGHT} , irrespective of the accuracy issues that will arise at these relatively low levels.

Recommendation 8

A growing number of cities seem to favour strengthening the common European approach through the inclusion of values or limit values (reception limits) to be set by the European Union. While testing the principle of subsidiarity, target or limit values (as in the CAFÉ Directive) obliges all authorities to make efforts to meet them; for example progress has been made in reducing PM_{10} levels. Such limit values must be designed so that they do not contradict the existing limit-values in Member States.

Serious consideration should be given to the inclusion of target and/or limit values in the END.

Recommendation 9

Consulting with the general public is an important step in the process of managing environmental noise. Only at a local level can the balance be made between an acceptable acoustic climate on the one hand and the many other interests (such as economic activity, overall tax burden, urban leisure facilities, etc.) on the other hand. The ideal picture drawn by the END is that when drafting action plans the local decision makers should extensively discuss these choices with their citizens. However setting up a real dialogue with the general public at large is challenging, and it is not always evident that policy-makers really want to rise to this challenge.

Consideration should be given to measures to stimulate public debate on noise and strengthen the engagement of both the general public and policy makers.

Recommendation 10

Complaints about environmental noise are driven only to a very limited extent by noise exposure levels. Nevertheless, there is a tendency to address noise complaints in noise action plans as an element of complaint management. This is a complicated matter, because complaints often refer to noise sources not treated in the noise action plan (such as scooters and mopeds, bars, music events, etc).

Including in action plans issues of noise from, for example, scooters or music events could persuade citizens to engage into the consultation process in a more positive way, leading to more public awareness commitment with regard to the general problems of environmental noise.

Recommendation 11

The Good Practice Guide on Noise Mapping is not yet generally acknowledged as a helpful document, yet it could be a good means for disseminating information and delivers a toolkit which can be helpful to overcome technical problems.

The Good Practice Guide on Noise Mapping should be revised, incorporating the Good Practice Guide on Port Noise (NoMEPorts) and carrying a more formal status.

Recommendation 12

The introduction of strict noise emission limits for vehicles and equipment is essential to achieving the goals set by the END. Noise problems cannot be solved at local level only and therefore noise limits on vehicles and equipment are also needed.

The European Commission should give priority to the introduction of more strict noise emission limits for all kinds of transport vehicles and equipment like outdoor machinery and mobile sources.

Recommendation 13

The END in its current form suffers from inconsistencies and incomplete or ambiguous definitions.

In revising the Directive attention should be given to the elimination of inconsistencies and ambiguities as well as to translation issues.

Recommendation 14

The END pays little attention to the issue of quiet areas and its definition of such areas needs be improved. Quiet urban areas specifically are very important for city populations. Parks, gardens, informal green spaces, enclosed courtyards, etc., characterised as white spots on the noise maps, are vital to inhabitants and their health. Criteria for such areas could be laid down in guidance supplementing the END.

More attention should be given in the END framework to the preservation of quiet urban areas.

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I Introduction

In 1996 the European Commission published a Green Paper on Future Noise Policy [2] as a first significant step towards the development of a European noise policy. Although legislation on noise sources like vehicles and cars already existed, the Green Paper outlined the future noise policy for Europe including a directive for the harmonization of methods to assess noise exposure and facilitate exchange of information between the parties involved.

After many years of preparation and hard work by the European Commission and Member States the Environmental Noise Directive 2002/49/EC was published on 25 June 2002². Article 11.1 of the Directive states that no later than 18 July 2009 the Commission shall submit to the European Parliament and the Council a report on the implementation of the Directive. The full text of article 11 is provided in the text box at the end of this chapter.

This paper was drafted by the EUROCITIES Working Group Noise (WGN)³. EUROCITIES WGN was established in the summer of 2006 and during its meetings special attention is continuously given to the implementation of the END and to the issues and problems experienced by its members. With this paper EUROCITIES WGN would like to take the opportunity to report on EUROCITIES' experiences and views on the implementation of the END to date.

In preparing this paper EUROCITIES WGN has commissioned students of the Open University of the Netherlands to conduct a survey among member cities on the effectiveness of the END [18]. Both report indicate that there are doubts about the effectiveness of the END. Of the 58 cities that completed the noise questionnaire, most have doubts as to the effectiveness of the END. During its autumn 2008 meeting the evaluation of the END was extensively discussed by the WG on the basis of a draft report written by DCMR EPA and DHV, a Dutch consultant for EUROCITIES WGN [1]. The report was based on the detailed minutes of the WGN meetings of recent years. A draft EUROCITIES paper was then discussed during the spring 2009 meeting in Florence.

This paper does not only reflect the experiences and problems encountered until now. It also reflects upon the lessons learnt during the first round of making strategic noise maps and subsequent noise action plans. We are convinced that the recommendations made in this paper offer a sound basis for improving the END and thus for improving the quality of strategic noise maps and noise action plans, helping to ensure that the second round of noise-mapping and action planning will result in a significant reduction of the number of Europeans exposed to unacceptably high levels of environmental noise.

Chapter II of this annex provides a brief overview of the European Commission's Green Paper on Future Noise Policy (1996). This Paper can be considered as the first significant step towards establishing European legislation on environmental noise. To help those who are less familiar with the END, chapter III of this annex focuses on the main considerations and objectives of the Directive. Chapter IV and V offer general observations, comments and recommendations with regard to the main objectives of the END. Chapter VI elaborates in more detail on problems of definition and national implementation.

² The Directive is commonly referred to as the Environmental Noise Directive and is often abbreviated as END. This abbreviation is used in this EUROCITIES paper.

³ Members of EUROCITIES WGN that contributed to the paper are: Amsterdam, Birmingham, Belfast, Copenhagen, Lille, Lyon, Oslo, Rotterdam, Stockholm, The Hague, Utrecht, Zaragoza

Full text of article 11 of the END

Article 11

Review and reporting

1. No later than 18 July 2009, the Commission shall submit to the European Parliament and the Council a report on the implementation of this Directive.
2. That report shall in particular assess the need for further Community actions on environmental noise and, if appropriate, propose implementing strategies on aspects such as:
 - (a) long-term and medium-term goals for the reduction of the number of persons harmfully affected by environmental noise, taking particularly into account the different climates and different cultures;
 - (b) additional measures for a reduction of the environmental noise emitted by specific sources, in particular outdoor equipment, means and infrastructures of transport and certain categories of industrial activity, building on those measures already implemented or under discussion for adoption;
 - (c) the protection of quiet areas in open country.
3. The report shall include a review of the acoustic environmental quality in the Community based on the data referred to in Article 10 and shall take account of scientific and technical progress and any other relevant information. The reduction of harmful effects and the cost-effectiveness ratio shall be the main criteria for the selection of the strategies and measures proposed.
4. When the Commission has received the first set of strategic noise maps, it shall reconsider:
 - the possibility for a 1,5 metre measurement height in Annex I, paragraph 1, in respect of areas having houses of one storey,
 - the lower limit for the estimated number of people exposed to different bands of L_{den} and L_{night} in Annex VI.
5. The report shall be reviewed every five years or more often if appropriate. It shall contain an assessment of the implementation of this Directive.
6. The report shall, if appropriate, be accompanied by proposals for the amendment of this Directive.

II The Green Paper on Future Noise Policy

The Green Paper on Future Noise Policy [2] that was adopted and published by the European Commission in 1996 was the first step towards the development of a European noise policy. The Green Paper stated that no person should be exposed to noise levels which endanger health and quality of life. This aim was previously stated in the 5th Environmental Action Programme [3] and may be considered as being very ambitious. The Green Paper also stated that no person should be exposed to noise levels above 65 dB(A) and that there should be a link between community noise exposure and EU policies regarding the noise from products and sources.

The Green Paper reported that around 20 percent of EU citizens were suffering from noise levels which were considered as being unacceptable by scientists and health experts. In 1996 this amounted to approximately 80 million people suffering from annoyance, sleep disturbance and other harmful noise effects. The Green Paper went on to report that at that time about 170 million people in the EU were living in areas where noise levels occurred that cause serious annoyance during daytime. In 1996 the European Union encompassed 400 million people. In 2009, due to the enlargement of the Union, the EU has grown to 500 million people living in the so called EU27 countries [4]. Assuming that the percentage of people that suffer from noise has not decreased since 1996, this means that around 100 million people are exposed to noise levels which can be considered as harmful.

The Green Paper outlined numerous options for further action such as a directive for harmonization of methods to assess noise exposure and the mutual exchange of information between the parties involved. Such a directive could include recommendations on noise mapping and the provision of information on noise exposure to the public. The Green Paper suggests that in a second phase of strategic noise mapping and action planning, target values could be considered along with the obligation to take actions to reach those targets. Although the Green Paper did not include any proposal for a limit value, it refers to the 55 dB(A) which was proposed by the World Health Organization (WHO) in their report “*Community Noise*”[5]and preceding reports .

Addressing tyre road noise, the promotion of low noise road surfaces by EU funding and the integration of noise costs in fiscal instruments were other proposals for the second phase. Furthermore the Green Paper called for more attention to railway noise by setting emission limit values for rolling stock and advised that economic instruments like variable track charges should be investigated.

The Green Paper showed the options to achieve a ‘quieter’ Europe through making many proposals that could be incorporated in what was then a proposed directive on environmental noise. After many years of preparation and hard work by the EC and member states this resulted in the publication of the END in 2002.

III Environmental Noise Directive 2002/49/EC

In the Green Paper the European Commission addressed noise as one of the main environmental problems in Europe. In its Resolution of 10 June 1997, the European Parliament expressed its support for the Green Paper and urged that specific measures and initiatives should be laid down in a Directive on the reduction of environmental noise. This Directive, the Environmental Noise Directive 2002/49/EC, was published on 25 June 2002.

To understand the contents and purpose of this paper it is important to understand that the main aspirations and objectives of the END are to prevent and reduce exposure to unacceptably high levels of environmental noise. The Directive thus clearly aims at contributing to EU policies to achieve a high level of health and environmental protection. The two main objectives of the END are stated in article 1 of the Directive:

Objective 1

“... 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.”

Objective 2

“... to provide a sound basis for developing community measures to reduce noise emitted by the major noise sources, in particular road and rail vehicles, infrastructure, aircrafts, outdoor and industrial equipment and mobile machinery...”

The first objective recognizes the fact that a common understanding of the noise problem is an important prerequisite for the effectiveness of the Directive. To achieve this it is necessary to collect, collate and report reliable data about environmental noise levels on the basis of comparable criteria. This implies the use of harmonised indicators and evaluation methods, as well as criteria for the alignment of noise mapping. The Directive offers a sound base for this in stating that 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.

By implementing these actions Member States should gain a better insight in problems concerning environmental noise. Dissemination of this information to the public should raise awareness about environmental noise and its effects. And last but not least, noise maps should enable the competent authorities to set the right priorities concerning environmental noise and to draw up noise action plans in consultation with the public.

The second objective provides a basis for developing and completing the existing set of Community measures concerning noise emitted by the major sources⁴. It furthermore provides a framework for the development of additional measures for the short, medium and long term, thus complementing Member States' efforts to reduce environmental noise levels.

⁴ Legislation on noise sources like vehicles and cars had already existed for many years. The first Directive on noise emission control dates from 1970 and gives permissible noise levels for the exhaust system of motor vehicles.

IV Evaluation: the common approach (objective 1)

The key element of a common approach as outlined in the END has been rather successful. Although many Member States have not yet delivered the necessary information at the desired level of quality, our impression is that a common approach to dealing with environmental noise has been implemented successfully and has been adopted by the Member States. The common noise indicators L_{den} and L_{night} , although criticised at their introduction, have largely been accepted and adopted. Criticism remains with respect to specific issues, such as the general receiver height of 4 meters and limiting the scope to the four main sources of environmental noise (road traffic, rail traffic, air traffic and industry), whereas other sources are ignored (such as neighbour noise, recreational and leisure noise, outdoor equipment noise). Another issue is the lack of a maximum level (L_{MAX}) in dB for night time disturbance.

Despite the successful implementation of the END and the availability of noise maps and action plans, it has to be said that until now (May 2009) there is little evidence that any significant progress has been made in avoiding, preventing and reducing environmental noise. Therefore realisation of the first objective mentioned in Article 1 of the END is still far away and it is doubtful if any Member State is yet on course to meet this objective. A Noise Questionnaire sent out by EUROCITIES [6] shows that more than 50 per cent of the European citizens living in large cities are exposed to noise level above 55 dB L_{DEN} and around 15 per cent of the citizens are exposed to noise levels above 65 dB L_{DEN} . When comparing this with the figures of the Green Paper no significant progress has yet been made.

Noise maps

In general it could be concluded that the noise maps have resulted in a better insight in noise pollution in Europe. Before the END was implemented many authorities were reluctant to establish and provide readily available information on the noise situation in their territories. In fact in only a few Member States noise was identified as a major problem, but in most cases no significant actions were taken to diminish noise levels. Thus the benefit of END is that information on noise exposure is now publicly available in all Member States and the body of data collected is still growing with the second round of noise mapping. There also seem to be some signs of awareness among the public and politicians about the presence and magnitude of noise pollution in their communities.

For many competent bodies it has been the first time that noise maps and/or noise action plans had to be made. Most of them encountered a fair amount of problems and obstacles in the process. Experience and knowledge were generally scarce and in many instances the competent bodies (mostly city administrations) experienced a lack of human resources.

In many cities no data infrastructure or appropriate channels for acquiring the necessary data existed. In many cases the data were available but simply not accessible in the way needed to make noise maps. In other cases data providers/owners were reluctant or unable to deliver the data needed. As a consequence it took a lot of time, effort and expense to put the appropriate data infrastructures in place. In many cases data collection was based on a one off action which suggests that similar problems will continue to exist in the second round of noise mapping (2012). As a consequence we may experience again that the timetable for delivering noise maps is too tight for many Member States.

The END lays down a system of assessment (noise maps) and consecutive action (mitigation). In this approach the emphasis is on mitigation of unacceptable or undesirable situations caused by developments in the past. Therefore, in most action plans there is no focus on avoiding developments that may lead to undesirable situations in the future. Admittedly, ANNEX IV of the END mentions that “different maps” could be made to show the difference between the existing situation and the future situation, i.e. after execution of the action plan. EUROCIITIES WGN would recommend not only drawing up noise maps for the present situation and the situation after the execution of action plans, but also one that takes into account the 'autonomous future development'. In doing so actions could also be based on identifying and avoiding the "harmful" effects of such developments, making action plans a more pro-active instrument for managing the acoustic urban environment.

In the Green Paper on Future Noise it is suggested that cumulative maps should also be produced. In the END this option is not included. A cumulative or combined map could give more insight in the total numbers of exposed/annoyed people and could be helpful for policy making and monitoring the overall acoustic climate in the city or agglomeration. EUROCIITIES WGN would recommend cumulative maps to be integrated in the END. Before doing so it is important to develop clear guidelines for adding up noise from different sources.

The END sets no rules or advice for coordination in cross border situations. Dealing with cross border issues at an early stage is necessary to produce compatible data and maps. It is apparent that problems have occurred with different time scales, different languages, different methods and different maps and data which were not compatible. As a consequence in border areas the public is confronted with different noise maps (colours, details, geography etc) which are hard, if not impossible for them to compare and understand. EUROCIITIES WGN would advise that action is taken to strengthen cross border coordination with regard to noise mapping.

Military sites are excluded from the END. This can give a wrong impression of the real situation as military activities often cause a lot of noise and annoyance (e.g. the AWACS in the border areas of Germany and The Netherlands are responsible for a great number of noise complaints). EUROCIITIES WGN takes into consideration that noise contours should be presented by the Ministries of Defence but in view of national security, this should not be accompanied by further information about the noise sources and their locations.

Noise Action Plans

There is considerable confusion about the status of action plans. We feel that a plan is a description of a set of activities with their expected or intended times of implementation. This means that an action plan should be defined in terms of 'SMART' objectives (specific, measurable, achievable, realistic, time related). So an action plan should not merely be a policy statement. It should describe the targets to be achieved, i.e. the effects in terms of noise exposure expected from the concrete actions to be taken in the period until the next round of noise mapping. A good action plan allows both politicians and the public to compare the anticipated reduction and the final result. It furthermore offers a framework for a revision of policies if needed.

Article 1.2 of ANNEX V mentions that budgets, cost benefits, measures already in force and measures in preparation must all be included in the action plan. For EUROCIITIES WGN this indicates that the END is aiming at SMART noise action plans as opposed to strategic plans and policy statements. EUROCIITIES WGN would recommend clarifying this issue as part of a revision of the END.

For many authorities the time between producing the noise maps and the subsequent action plans was far too short. Because of the strategic nature of noise maps most authorities had to generate more detailed data to be able to draw up action plans. This has been very time consuming and resulted in frequently exceeding the deadlines set in the END. The same problems may also (at least in part) account for the fact that many action plans consist of more or less general policy statements and have a limited scope with regard to concrete actions to reduce environmental noise levels.

Furthermore it seems hard for especially local authorities to set clear goals for the future. The END only compels authorities to make noise maps, to draw up action plans and to designate hotspots. The Directive provides no guidance for clear targets, for example with regards to reduction of the number of exposed/annoyed people. There is no clear driving force that urges the competent bodies to actually reduce noise levels.

The need for more target oriented provisions in the END is further supported by recent insights of the World Health Organisation. They indicate clear physiological effects of noise (cardiovascular and other stress induced diseases resulting in reduction of a person's expected life-span). Furthermore dose-response relations indicate that a substantial percentage of people will experience serious annoyance at L_{den} levels of 42 dB and above. EURO CITIES WGN recommends that the next round of noise mapping starts at an L_{DEN} of 40 dB and 35 dB L_{NIGHT} , irrespective of the accuracy issues that will arise at these relatively low levels. Furthermore a compulsory time frame for implementing measures mentioned in action plans would be useful. This kind of deadlines is also effectively being used in other EU legislation (e.g. CO₂ limits).

Hotspot approach

Another comment refers to a typical interpretation of the END. Some national legislation defines that action plans should be based on an assessment of so-called hotspots (without defining what a hotspot is). Hotspots are then defined either as sites with a high noise exposure level or sites with a high noise exposure index (the product of population density and noise exposure level). However, in general only a very small percentage of a city's population is represented in this focus on hotspots. Concentrating all the action on these areas would then result in a very small reduction of the annoyance numbers.

Limited options at local level

In all cities urban road traffic appears to be the most important source of environmental noise. Action plans show that there are only a limited number of options that effectively reduce noise levels caused by urban traffic. The application of quiet road surfaces is an effective measure but the cost-benefit issues are often unclear. In addition, road maintenance departments are often reluctant to apply these surfaces for durability reasons. The introduction of low noise emission zones in cities is considered, but often strongly discouraged by national governments; the same applies to the introduction of charges or penalties for noisy road vehicles. Furthermore traffic management may have very limited effects, as halving the traffic flow only brings about a 3 dB reduction. The same applies to mobility planning such as promoting public transport or non-motorised transport.

A combination of these measures is to be considered depending on the situation in individual cities. In some hotspots the reduction can be sufficient, but the overall reduction in noise levels will amount to no more than 3-5 dB. This is insufficient to substantially reduce the number of

exposed/annoyed people. This can only be achieved by the introduction of quieter means of transport brought about by strict noise emission limits or by using alternative (developing) technologies like hybrid and electric cars.

Common methods and indicators

The requirements of the END are based on the principle of subsidiarity. This ensures that decisions are taken as closely as possible to the citizen. It also ensures that constant checks are made as to whether actions at community level are justified when set against measures at regional, national or international level. The principle of subsidiarity is closely linked to the principles of proportionality and necessity, which require that any action taken by the EU should not go beyond what is necessary to achieve the objectives of the Treaty.

One of the consequences of the principle of subsidiarity is that no noise limits were introduced in the END. At the time the END was drafted, the general consensus was that noise is a local issue which could not effectively be tackled using a single limit value. What is acceptable or is not acceptable is a matter of local consideration. Therefore the END puts much emphasis on improving the dialogue between local politicians and decision makers on the one side, and the local general public on the other.

A growing number of cities seem to favour strengthening the common European approach through the inclusion of some sort of target values or limit values (reception limits) to be set by the European Commission. This would be in contradiction with the principle of subsidiarity. However, EUROCIITIES WGN notices that target or limit values (as done in the CAFÉ Directive) force all authorities to make efforts to meet them. A good example is the progress that has been made in reducing PM10 levels. EUROCIITIES WGN would recommend that serious consideration be given to the possibilities of including some sort of target and/or limit values in the END.

Modelling

The interim prediction methods prescribed in the END have not been used in many cases. On the contrary, most member states have used their national methods. This is an obstacle to get comparable data all over Europe. Currently, the Joint Research Centre (JRC) is comparing the methods used. The expected outcome will be that there are substantial differences between methods. Even within one method, there may be substantial differences in outcome between different users or between different software packages. EUROCIITIES WGN has found that even if the same methods and software are used deviations can be found. For example as a result of different settings in the software. So obviously there are many sources of deviation in the chain PREDICTION METHOD - SOFTWARE PACKAGE - USER MADE MODEL. These may lead to drastically different estimates in numbers of exposed people and even in the assessment of mitigation measures. There is thus a strong need for harmonisation.

The 'Harmonise and Imagine' method, in conjunction with the current proposal by some of the former consortium partners to produce a 'Harmo-Imagine' 'maps' version with limited complexity, is a good starting point. Software suppliers can only be persuaded to develop standardised software packages if the END imposes the use of such harmonised methods.

Another point of interest should be the long distance sound propagation. Most of the available methods and software cannot accurately predict sound levels at distances over 500m from the source.

In many instances, traffic models have been linked to noise prediction models, so as to give an integrated tool for traffic management related mitigation of noise. In practice very few cities have reviewed and altered traffic flows produced by these models for their first round of noise mapping. Traffic models have been used as a database for the 2006 traffic input data. But the traffic models have not been used to optimize traffic flows for better noise reduction. There is a political and public need to show the efficiency (if any) and the logic of traffic related noise mitigation measures. That way the potential of integrated traffic and noise prediction models becomes apparent.

Tailor made maps

In practice different types of noise maps are required for noise mapping and for noise action planning. Counting numbers of exposed dwellings is best carried out in a noise contour map using a GIS for evaluating ZIP code density for example. For the assessment of hot spots, a map showing building blocks with different colours characterizing their noise exposure would be more appropriate. The results derived from these different types of maps may differ significantly however, often due to unreliable traffic data. More and better guidance is desirable. Such guidance may be provided by the Good Practice Guide on Noise Mapping (see below).

Public awareness and political commitment

Consulting with the general public is an important step in the process of managing environmental noise. The idea is that only at a local level, the balance can be made between an acceptable acoustic climate on the one hand and the many other interests (such as overall tax burden, urban leisure facilities, economic factors, etc.) on the other hand. The key question is: what kind of city do we want to be? Often the choice is between a high speed, dynamic, expansive, young, intense - and somewhat unhealthy - city, and a slow speed, high quality, conservative, green and healthier city.

The ideal picture drawn by the END is that the local decision makers, when drafting action plans should extensively discuss these choices with his citizens. In reality things are different. In countries like The Netherlands public consultation has developed into a highly technocratic event in which the 'noise activists' are dominant.

Setting up a real dialogue with the general public at large is challenging, and there could be doubts as to whether the authorities really want to engage in this challenge. For example announcements for public consultation have been put in the less prominent parts of local newspapers, noise maps have been made available through hard to find pages of city web sites, etc. Raising awareness amongst policy makers and politicians about environmental noise, its adverse effects and measures to mitigate these effects, are nevertheless crucial for commitment at local, regional, national and European levels.

EUROCITIES WGN has commissioned the Radboud University (Nijmegen) to carry out a survey on gaining political interest for environmental noise. The survey [17] shows that in general, policy makers and politicians do not regard environmental noise as an urgent problem. Commitment of local politicians and policy makers to drawing up consistent Action Plans that prevent and reduce environmental noise seems to be low [7,15]. A major reason for this seems to be a lack of (financial) resources and the perception that the local possibilities to substantially influence environmental noise levels are limited. EUROCITIES WGN would advise to seriously consider measures to stimulate the public debate and to take action to strengthen commitment of both the general public and policy makers.

Complaints about environmental noise are only to a very limited extent driven by noise exposure levels. Nevertheless, there is a tendency to address noise complaints in noise action plans as an element of complaint management. This is a complicated matter, because complaints often refer to noise sources not treated in the noise action plan (such as scooters and mopeds, bars, music events, etc). EUROCITIES WGN holds the view that addressing these issues could persuade citizens to engage into the consultation process in a more positive way, leading to more public awareness commitment with regard to the general problems of environmental noise.

Dissemination of information

Many reports about possibilities to reduce and manage environmental noise have been published during the last decades. Nevertheless many policy makers and noise experts are unaware of this, limiting them in the search for possible solutions to environmental noise problems.

Although most of the reports are available on the Internet, the information they contain does not always relate to everyday practice of policy makers. Furthermore there is no central “library” from where the information can be accessed and there are too many entries, which limits the accessibility of the information.

In order to help to solve (part of) this problem a number of cities, together with universities and relevant institutes all over Europe, developed the DINOMAC proposal [11] during the FP7 call. DINOMAC stands for Dissemination of Noise measures and Management Amongst Cities. The proposed project aims at bringing together knowledge and information about viable noise actions and measures, thus showing to all parties involved (policy makers, city experts and their advisers) how noise in cities can be managed.

Furthermore the so called Good Practice Guide (GPG) on Noise Mapping could be a good tool for disseminating information. However, the GPG is not yet generally acknowledged as a helpful document. EUROCITIES WGN would recommend to revise the GPG, incorporate the GPG on Port Area Noise Mapping and Management (NoMEPorts) and award it a more formal status and possibly translate it into more languages than just English. .

V Evaluation: developing community measures (objective 2)

The second main objective of the END provides a basis for developing and completing the existing set of Community measures concerning noise emitted by the major sources. It furthermore provides a framework for the development of additional measures for the short, medium and long term, thus complementing Member States’ efforts to reduce environmental noise levels.

EUROCITIES WGN anticipates that the aggregated noise exposure results for Europe will show that the number of European citizens affected by potentially harmful environmental noise levels is very high. EUROCITIES WGN believes that at local level the possibilities to substantially reduce noise levels are limited. Measures like traffic management, the use of quiet road surfaces or access restricted zones have limited effects in terms of reducing the number of exposed and annoyed people. The average reduction in noise levels that can be obtained amounts to 3-5 dB. At specific locations higher reductions can sometimes be achieved (e.g. up to 10 dB with the erection of noise barriers/screens). Taking into account that noise levels regularly exceed 70 dB in daytime, additional measures are needed on national and European level.

The most (cost) effective measure would be to significantly reduce the noise generated by vehicles. Quiet tyres are already available on the market, and their large scale introduction should be supported by an early introduction and review of the tyre noise directive.

Vehicles with a type approval for the European road network may differ substantially in noise production: heavy SUV's create much more noise than small city cars. Nevertheless, they both meet the European type approval limits. Cities however have a need to differentiate regardless of the type approval. This is for instance the case when a city wants to introduce low noise emission zones where quieter car types can enter and loud car types are prohibited.

Road vehicles will become cleaner and will consume less fuel in the decades to come. This most likely means that the industries will not invest substantially in the reduction of noise emissions. This adverse development should be compensated for by appropriate research, for example linked to 7FP. From the work of the CALM network, it has become clear that major reductions in emissions of cars, trucks, airplanes and railways are technically feasible. These reductions could quite easily exceed the average reductions which can be achieved by local measures (3-5 dB). This means that, in addition to noise reduction at local level, measures on a European and a national level are essential in order to realise major improvements of the urban acoustic environment. On national level actions can be taken to promote and/or subsidise the use of electrical or hybrid cars, promote the use of environment friendly modes of transport for short distances (walking, biking, etc.) and improve public transport as an alternative to the use of private cars.

In addition the use of quiet road surfaces, primarily a local responsibility, could be supported and stimulated by appropriate measures and initiatives from the European Commission. Similarly certain city planning principles, such as the use/creation of a quiet façade, may be stimulated or supported by Community guidelines.

In EUROCITIES WGN there is a general consensus that the introduction of strict noise emission limits for vehicles and equipment is essential to achieve the goals set by END. This is however the exclusive competence of the European Commission. Therefore EUROCITIES WGN urges the Commission to continue developing and completing the existing set of Community measures concerning noise emitted by the major sources. EUROCITIES WGN would recommend that the Commission gives priority to the introduction of more strict emission limits for all kinds of transport vehicles and equipment like outdoor machinery and mobile sources.

VI Evaluation: definitions and national implementation

The END contains many terms, phrases, and sentences which could lead to different interpretations; not only by Member States but also by all parties involved in the implementation and the activities of the END. This has led to differences in national implementation as far as the obligations of the END are concerned. For example, in Germany only the noise from IPPC enterprises is considered in the noise maps. However, in the Netherlands the zoned industrial areas according to the Dutch Noise Act are put on the noise maps, which means that small and medium sized enterprises are also included.

Furthermore, the definitions used in the END do not comply with the metrics and/or definitions used in Member States. For example, in several Member States noise limits already existed for numerous kinds of noise (e.g. traffic noise, railway noise, airport noise and industrial noise). The metrics used were manifold (L_{Aeq} , L_{24hrs} , L_{10} , L_{50} , PNL, IP etc.). In conversion of national metrics to EU metrics sometimes choices were made that could be questioned. This could also be true for

perceiving height in metres. Some conversions have been inaccurate to say the least.

The observations in this chapter lead to the general advice to screen the texts of the Directive for inconsistencies and incomplete or ambiguous definitions. EUROCIITIES WGN would recommend that the Directive be revised as to eliminate inconsistencies and ambiguities and that attention is given to translation issues.

Definitions

The definition of action plan in Article 1 sub-section c seems to be different from the definition in Article 3 sub-section t.

It is felt that the END pays little attention at the issue of quiet areas and the definition given in Article 3m allows for much variation and should therefore be improved. Also quiet urban areas are missing in the END while those areas are very important for cities. They are virtually everywhere: in city parks, in the areas behind closed building blocks, in nearby recreational areas, etc. These sites can be characterised as white spots on the noise maps and of great importance to inhabitants. As far as we can see, not many cities have engaged in identifying these areas, let alone preserving them. EUROCIITIES WGN would therefore recommend that more attention be given to the preservation of quiet urban areas. Criteria for such areas could be laid down in a guidance book or another document related to the END.

The END refers to both noise maps and strategic noise maps. It is not clear whether these are the same or that different maps are meant. EUROCIITIES WGN believes that different maps are meant, because competent bodies could provide integrated maps, difference maps, more detailed maps, maps of parts of the agglomeration and so on. To end existing confusion clarification is needed.

The definition of a major road (more than 3 million vehicles per annum) does not imply that dwellings along roads with lower vehicles flows do not produce noise levels higher than 55 dB L_{DEN} at nearby dwellings. This is especially true when these dwellings are close to the road and/or the speed limits are relatively high.

Implementation

Significant differences were found between Member States in the designation of competent bodies. It was found that the responsibility for noise mapping and action planning was delegated to central government departments, transport operators, cities, and regional bodies or even to boroughs. In doing so an unnecessary obstacle has been introduced to the effective exchange of knowledge and experience between competent bodies and European cities.

Agglomeration as a concept is not defined in the END. This has led to different interpretations. Some countries have chosen the definition that is used in the Air Quality Directive to achieve a coherent approach in defining agglomerations. Other countries have made other choices based on for example population density. With regard to getting a set of comparable noise exposure data all over Europe this is unfortunate.

Another issue concerns noise hotspots. It is unclear how to identify these hotspots as no criteria or methods are provided by the END. This means that there will be remarkable difference between Member States.

The END states that “Harmful effects shall mean negative effects on human health”. Apart from 42 dB, no threshold is given and it remains unclear which definition of ‘health’ is being used (the WHO definition?).

The END also states that “Annoyance shall mean the degree of community noise annoyance as determined by means of field surveys.” There is however no indication of standards for carrying out such surveys. This is relevant because estimation of the number of annoyed on the basis of for example the so-called Miedema curves will deviate considerably from a field survey approach.

In some countries it is mandatory to carry out a so-called Environmental Impact Assessment (EIA) on noise action plans. In other countries this is not the case unless large infrastructure developments are planned.

Noise mapping definition introduces two strands, namely the existing or the predicted situation. The predicted situation needs more explanation.

Translations

The translation of the END into other languages has introduced differences between countries. Some examples are:

In the Dutch translation of the END the word ensuring is not translated which could lead to an interpretation that informing the public in a very poor way could be sufficient. The English text looks more binding and convincing.

The Dutch version of the Article 3q of the END speaks about a Noise Map as a product (geluidbelastingkaart - which means a map with the noise levels), while the English version speaks about Noise Mapping as a process. Perhaps this is because of the limitation of the Dutch language where there is no equivalent term to noise mapping.

VII Literature

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