



**Acoustics'08  
Paris**  
June 29-July 4, 2008

[www.acoustics08-paris.org](http://www.acoustics08-paris.org)

*euronoise*

## Strategies for noise action plans

Paul Vos, De

DHV BV, Postbus 1132, NL 3800 BC Amersfoort, Netherlands  
paul.devos@dhv.com

Following the requirements of the Environmental Noise Directive, local authorities in agglomerations and road, rail and airport authorities in all Member States should have produced a Noise Action Plan. This Action Plan is supposed to build on two important pillars: the findings of the strategic noise maps and the results of the consultation with the local residents. Many competent authorities show a tendency to ignore the latter one. In some cases, the plan is considered as a mere statement of the long term policy of the authority under concern. In other cases, it is set up as an implementation plan with clear and measurable targets. Also the focus varies: only the highest noise levels could be attacked or the large numbers of exposed citizens, or even the overall annoyance. Target noise levels may lead to confusion both for local decision makers and citizens. The levels can vary according to the specific use that is made of the area under concern. Also, the preservation and possible creation of quiet areas can be envisaged. The use of an equal annoyance indicator helps to set the targets in the right perspective. Translation into different levels of quality of life is recommended. In terms of cost and benefits, the options for city councils are very limited. Due to a lack of European legislative power, cities tend to set their own rules, e.g. for road vehicles. Several initiatives to propose toolkits for action plans, comparable to the best practice guide for noise mapping, are welcomed but require harmonization and dissemination.

## 1. Introduction

The Environmental Noise Directive, in force since 2002, requires Member States to produce strategic noise maps and noise action plans. In many Member States, the Directive has been implemented in national legislation, requiring the so-called competent authorities, i.e. city councils and road, rail and airport authorities, to produce the maps and action plans. The Directive and the legislative regulation based thereon specify, in detail, the methods to be used for the production of noise maps (Annex II), as well as the minimum requirements for noise maps (Annex IV) and for action plans (Annex V). In addition to those specifications, the Commission has made available the Good Practice Guide for Noise Mapping [1], which serves as a technical guideline for the production of noise maps.

Noise maps and action plans are expected for:

- 162 agglomerations with more than 250 000 inhabitants;
- 82,575 km of major roads having more than 6 million vehicle passages a year;
- 12,315 km of major railways with more than 60,000 train passages a year;
- 76 major civil airports with more than 50,000 movements a year.

In essence, the noise maps are a representation of the number of residents exposed to specific noise levels, in noise level classes of 5 dB, for the reference year 2006. They are the starting point for the action plans.

## 2. Action planning

### 2.1 “Smart” planning

The action plans should define the planned actions, for a period of 5 years, envisaged by the responsible authority with the objective to reduce the harmful effects of exposure to environmental noise. Essential is the interpretation of the word plan; according to the Cambridge dictionary, a plan is “a set of decisions about how to do something in the future.” In this definition, the plan is a set of concrete actions, with a definite time horizon. In combination with the 5 years periodicity of the planning cycle, the Directive has adopted the well known plan-do-check-act cycle of

continuous improvement. In this respect it is recommended to set the objectives of the action plan as “smart” as it can possibly be, smart meaning in this respect specific, measurable, achievable, relevant and time specific. It is important to emphasize that an Action Plan is not a Policy Paper, setting general and non-binding intentions, but rather a political contract.

### 2.2. Reference situation

Action planning includes a definition not only of the starting point (the result of the noise maps) and the desired long term objective (e.g. “no residents exposed to harmful noise levels”), but certainly an outlook to the expected results achieved at the end of the plan period, i.e. 2011 for the first round. To this extend, it would be desirable that noise maps be produced not merely for the current situation, but also for the future situation that would arise from the business-as-usual scenario. Particularly in cases where significant spatial plans are involved, it is recommendable to set the priorities in relation to that future situation than to the current one. This would better reflect the objectives of the Directive, which state not only reduction of harmless effects, but also their avoidance and prevention.

When it comes to predicting future developments, many cities have been struggling with the expected impacts of the European Commissions policy regarding the emission of noise sources such as road vehicles, rail vehicles, aircraft and outdoor machinery. Although the Directive states, in Article 1.2, that the Commission shall report about its own plans for these sources, concrete measures and their impact have not yet been published. This makes it virtually impossible to take account of these impacts in assembling the future “do-nothing” scenario. It is this scenario which cities would want to use as a reference for the impact of their own action plans.

## 2. Hot spots

The desire to set “smart” objectives for the action plan, in combination with the graphic presentation of strategic noise maps, almost automatically leads to the concept of hot spots. A hot spot on the map represents a location where the noise exposure exceeds a certain level. For visual effects, it is thought to be first priority to remove such hot spots. Indeed this would reduce the number of people affected by

very high noise exposure, but it would not necessarily be the best strategy in terms of reducing the harmful effects due to noise annoyance and sleep disturbance. The following graph indicates numbers of exposed dwellings and (seriously) annoyed residents due to urban road traffic noise for an average Dutch city. The distribution is quite typical for any city.

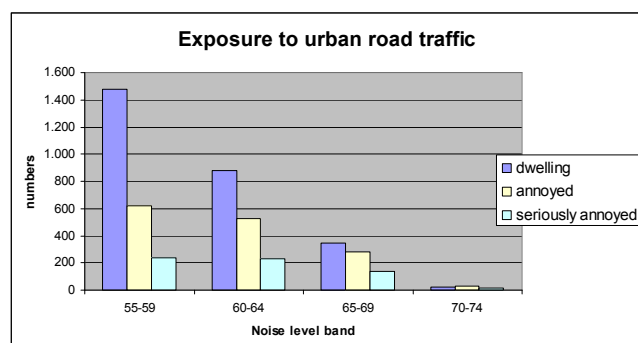


Fig. 1 Typical distribution of exposed dwellings, annoyed and seriously annoyed residents due to road traffic noise in a Dutch city

Several methods have been proposed, e.g. in the EU funded project Q-City, to focus more on annoyance hot spots than on noise exposure hot spots. The conclusion from the graph however is, that the large numbers of affected residents are in the bands of lower noise exposure. It is almost impossible to designate hot spots in these bands, and this obviously has a large influence on the priority mitigation measures to be included in the action plan. It calls for more generic measures rather than site related measures.

There is another reason why concentrating merely on the hot spots is not the best way to deal with environmental noise in cities. That is that it completely ignores the value of “cold” or quiet spots. Quiet areas should be a major concern, not only because they are to be addressed in the Action Plans according to Annex V, but also because they represent a useful compensation for residents being exposed to harmful noise levels. In addition, preserving quiet areas has the effect that adjacent dwellings with relatively low noise exposure may also be protected. This approach shifts the focus from the low numbers of annoyed residents to the high numbers of annoyed residents (re. Fig. 1).

### 3. Local targets

In setting targets for the local action plan, there is large freedom of choice. It is remarkable that cities, united in the Eurocities lobby network, have recently been calling on the Commission to set harmonized noise reception limits aimed to set priorities in action planning. This call ignores a crucial element in the approach of the Directive, which is that environmental noise is mostly a local problem, and that it is best decided at local level, what is acceptable and what is not. The Directive therefore intends to focus on a dialogue between the local authority and the local residents. This approach in the Directive reflects the experience of one of its intellectual parents, Dr. Tjeerd ten Wolde. This experience included the Dutch Noise Control Act, in force since 1978, which was representative for a centralistic

approach, where uniform noise limits would be set for application in any situation and at any time. 25 years of experience with this approach had shown, that particularly cities were opposing against this rigid legislation, claiming that noise limits for suburban green areas could not reasonably be applied to crowded city centers, and that the confrontation of growing traffic and lack of space for urban planning purposes would require a more flexible approach to noise limits. This experience is strongly reflected in the Directive. It attributes responsibilities for noise creation limits, i.e. for road and rail vehicles and infrastructure, for aircraft and for industrial equipment and machinery, to the European Commission, but it leaves the responsibility to set noise reception targets to the national governments and – particularly – to the city authorities in dialogue with their voters and residents.

### 4. Dialogue with residents

Although it may be difficult to recognize, these and other experience have influenced the END as it is today. The plan is supposed to build on two important pillars: the findings of the strategic noise maps and the results of the consultation with the local residents. Many cities show a tendency to ignore the latter one.

While drawing up the action plans, many cities have motivated the limited ambitions by their lack of funds available for noise mitigation measures. Indeed, noise mitigation so far has been funded either through national funds for cleaning up or by the spatial plans, be it in combination with planned infrastructure or planned residential areas. The funding used to be driven by national noise limits that needed to be kept. The new element in the Directive is, that cities and competent authorities now have the opportunity to choose other target values, beyond the national limits. These may well be more ambitious (i.e. lower) than the national limits. The mitigation measures needed to obey these targets will then need local funding, but this should be considered an investment in quality of life and public health. Many cities make larger investment on weaker bases! On the other hand, some national legislative schemes allow higher target values than the national limit, be it under certain conditions. The advantage of allowing higher limit values is that it paves the way for new developments that otherwise would be delayed or made impossible by rigid noise legislation. Therefore, the decision about local target values is in essence a decision about the city’s ambition with respect to its growth potential, its dynamism and its quality of life. And a decision about this needs an in-depth dialogue with the voters, taxpayers and residents.

Unfortunately, in the process of producing maps and action plans, we have seen very little ambition to set up this dialogue. Not seldom, city councilors are afraid of their own people, are reluctant to enter into a process of consultation and dialogue. Apparently, they feel that there is nothing to gain, at least not in terms of electoral gain, from this dialogue. We might conclude that we have failed, as noise experts, to make it clear to local politicians and residents where the gain is. Clearly this gain is in creating more attractive cities, cities where people chose to live because of the high quality of life. There are cities where people have a choice, namely to be part of the hectic city

life or rather part of the peace and quiet of a city backyard. In the coming decades, with a predicted negative population growth, creating a high quality of life might well be a survival strategy for many cities!

## 5. Major sources

Action plans are to be drawn up not only for agglomerations, but also for national infrastructure such as major roads, major railways and major airports. The environmental noise exposure caused by these sources has been a major cause for concern since long. This concern was raised by the nature of most of these sources: although their noise emission was successfully reduced over the last decades, this effect was overcompensated by the drastic growth of transport growth. Other effects, such as the increased engine power and speed of road vehicles, have added to this effect. As a result, control of transport noise has lost credibility of the general public and attracted much government attention, resulting in large national and multinational research programs. Enormous lengths of noise barriers have been erected along highways and railway lines, and many dwellings received façade insulation. Most of these measures as well as the research programs were publicly funded.

The action plans from the infrastructure managers appear to be based on the business-as-usual scenario:

- Mitigate additional noise where it occurs due to significant changes in infrastructure, and, if the legislation addresses this, traffic growth ,
- Implement technological advancement, e.g. quiet road surfaces, as the basic quality as long as it does not lead to significantly higher cost.

The shocking conclusion from the noise mapping operation, at least in The Netherlands, was that the majority by far of the seriously annoyed people live in cities. Therefore it seems reasonable to question, in hindsight, the focus of all the past efforts for major roads and railways.

What should then be the strategy for noise action plans for major roads, railways and airports? Whenever large numbers of people are affected by these sources, often they turn out to be living in urban areas. The strategy, certainly in planning new infrastructure and extensions, is clearly to avoid urban areas. The effect of that all is that “quiet” as a quality of the surroundings of cities is seriously endangered. More focus on the rare quiet areas and their protection in the action plans for major sources would be justified. Unfortunately it is unlikely that such a recommendation will come out of the public consultations for action plans.

Airport noise is different, in that received much attention from the general public, is often a source of continuous dispute, but it knows the “balanced approach” to noise management, which is advertised by the European Commission as the preferred strategy for airport noise. Elements of the balanced approach are:

- Noise reduction at source,
- Land use planning adapted to the noise targets,
- Operational procedures that reduce noise,
- Operating restrictions for certain type of aircraft.

One could imagine that a similar “balanced approach” for main roads and main railways could be developed by the infrastructure managers as part of their Action Plans.

## 6. Mitigation toolbox

Even when cities and infrastructure managers are very ambitious in setting targets for the desired quality of life, their toolbox of measures within their control turns out to be fairly small. In Annex V, the Directive presents 6 examples of actions to be taken by competent authorities, viz.:

- Traffic planning,
- Land-use planning,
- Technical measures at noise sources,
- Selection of quieter sources,
- Reduction of sound transmission,
- Regulatory or economic measures or incentives.

Given the fact that road traffic appears to be the dominant source by far in urban areas, the application of the above families of measures requires ambition and creativity. When the noise maps have been produced with a tool which is not an integrated traffic and noise model, it is often difficult to start the mapping all over again for a range of traffic planning scenarios. The basic choice is between concentration or distribution of the traffic flows. In many cities, road traffic is considered a fact of nature, which can hardly be controlled by man. Technical measures at source or selection of quieter sources are hardly feasible for road vehicles, since the city has no competence there, other than showing an exemplary attitude in the cities own fleet. Probably the most promising field is that of regulatory or economic measures. Low emissions zones have been defined and implemented in many cities in the framework of air quality action plans. It is a promising challenge to find the equivalent of Low emission zones for environmental noise.

In that respect it would be most helpful if a more integrated approach to quality of life in cities could be established. Different EU Directives and expected new regulation requires cities to draw up action plans for air quality, environmental noise and – in future – sustainable urban transport. A mere synchronization of the schedule for these plans would be a useful step towards such a more integrated approach.

## 7. Conclusion

In the previous chapters, some suggestions have been made which could lead to more efficient, more ambitious and more successful noise action plans. The one suggestion that combines them all is for the European Commission to fund the drawing up of a Good Practice Guide for Noise Action Plans.

## **Acknowledgments**

The observations referred to in this paper were made during the execution of the Polka project, a web based helpdesk and project management office to support and control all parties involved in noise mapping and action planning in The Netherlands. The Polka project started off in 2004 in assignment of the Netherlands Ministry of Housing, Spatial Planning and Environment.

## **References**

- [1] EU Working Group on Assessment of the Exposure to Noise, Good Practice Guide for Strategic Noise Mapping, ([http://ec.europa.eu/environment/noise/pdf/wg\\_aen.pdf](http://ec.europa.eu/environment/noise/pdf/wg_aen.pdf))