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Action planning in eastern Europe

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ABSTRACT

The First round of the noise mapping obligation according to the European Noise Directive (END) has been finished recently. By the end of 2007 all member states should have prepared their noise maps according to the directive and should have send the noise mapping reports of the European Commission. In 2008 the EU Member states will continue the implementation of the END by preparing the action plans in order to reduce the number of affected inhabitants.

This paper focuses on the action planning work according to END. The authors present here the comparison of two action plans for mid size cities in Eastern Europe. The two compared cities are Szeged in Hungary and Timisoara in Romania. In the two cities geographically very close cities (80 km) with even having a similar urban built up, one would assume the preparation of similar action plans. In opposite to this the authors found more at first sight minor differences than similarities which turned out in the end to have big influence on the action planning procedures.

The authors have carried out strategic action plan for both of the cities in the near past. This paper compares the action planning procedure between the cities. The action plan, and the comparison consist beside the noise reduction possibilities of the cities from a lot of non-noise related issues.
The paper presents the comparison along highlights the future urban development plans of the cities to be considered, the financial possibilities and the participation of the public in action planning.

1. INTRODUCTION

The Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise (hereafter referred to as the

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Environmental Noise Directive, abbreviated to END) forces the member states to prepare strategic noise maps and action plans for their mayor agglomerations. (Remark: There are also other non mentioned requirements in the END, but those are not relevant to this paper.)

The main aim of this Directive is to provide a common basis for tackling environmental noise across the EU. The underlying principles of this Directive are:

- to monitor environmental noise by requiring competent authorities in Member States to draw up 'strategic noise maps' for major roads, railways, airports and agglomerations, using harmonized noise indicators L_{den} (day-evening-night equivalent level) and L_{night} (night equivalent level). These maps will be used to assess the number of people annoyed and sleep-disturbed respectively throughout Europe;
- to inform and consult the public about noise exposure, its effects, and the measures considered to address noise, in line with the principles of the Aarhus Convention;
- to address local noise issues by requiring competent authorities to draw up action plans to reduce noise where necessary and maintain environmental noise quality where it is good. The directive does not set any limit value, nor does it prescribe the measures to be used in the action plans, which are at the discretion of the competent authorities.
- to develop a long-term EU strategy, which includes objectives to reduce the number of people affected by noise in the longer term, and provides a framework for developing Community policy on reducing noise at source.

In this paper we present the comparison of strategic action plans for two different cities, Szeged in Hungary and Timisoara in Romania.

2. CALCULATION METHOD AND LIMIT VALUES OF THE EUROPEAN NOISE DIRECTIVE

For the first round of noise mapping the Member States may use the recommended interim noise computation methods, as set out in Annex II of the END. The requested adaptations of the interim calculation methods for industrial noise, aircraft noise, road traffic noise and railway noise, and related emission data methods have been published by the EC [2].
Alternatively, member States may use their existing national noise computation methods, adapted to the definition of the noise indicators as set out in Annex I of the END.
There are existing Hungarian calculation methods for road traffic noise (emission side) [3], rail traffic noise (emission side) [4] and for industrial noise calculation [5-8]. Furthermore, a Technical Proposal [9] has been worked out for the noise emission models of the relevant noise sources, and the propagation method [5] was recommended for all earth-bound source types (road-, railway-, industrial noise). The use of Hungarian noise emission models is necessary for road and railway noise, because it is important to take into account the particulates of the Hungarian national situation, different vehicle and railway fleet, different brake systems, etc.
In Romania it was decided to use the NMPB-96, the French Method as recommended by the END.
The time slices of the noise indicator Lden / calculated according to formula below/ are also different for the two member states.

$$L_{den} = 10\lg\frac{1}{24}\left[12\cdot 10^{\frac{L_{day}}{10}} + 4\cdot 10^{\frac{L_{evening}+5}{10}} + 8\cdot 10^{\frac{L_{night}+10}{10}}\right] \quad (1)$$

where:
L_{day} - 12 hour equivalent noise level for day
$L_{evening}$ - 4 hour equivalent noise level for evening
L_{night} - 8 hour equivalent noise level for night

In Hungary day is considered from 6 am until 6 pm, evening from 6 pm to 10 pm. and night from 10 pm until 6 am. In Romania day is considered from 7 am until 7 pm, evening from 7 pm to 11 pm. and night from 11 pm until 7 am.
This difference has a high influence on the nighttime noise level.

According to the END the member states have to set noise limit values.. The action plans must be prepared according to excess of those limit values. The action plans must start, with the noise causing the biggest limit excess.
For traffic noise sources the limit values in Hungary are 63 dB for L_{den} and 55 for L_{night}. In Romania there are different limit values 70 dB for L_{den} and 60 for L_{night}

3. PRESENTATION OF THE CITIES AND THEIR MAYOR NOISE SOURCES

Szeged is the fourth largest city of Hungary, the regional centre of South-Eastern Hungary and the capital of the county of Csongrád. Szeged is situated near the southern border of Hungary, just to the south of the mouth of the Maros River, on both banks of the Tisza River
Area: 280.84 km²
Population (2008) : 167,039

Traffic situation in Szeged is determined by the urban traffic and the traffic on mayor road nr. 43 and 47. crossing the city. Road nr. 43. leading to Romania has a significantly high percentage of HGV-s.

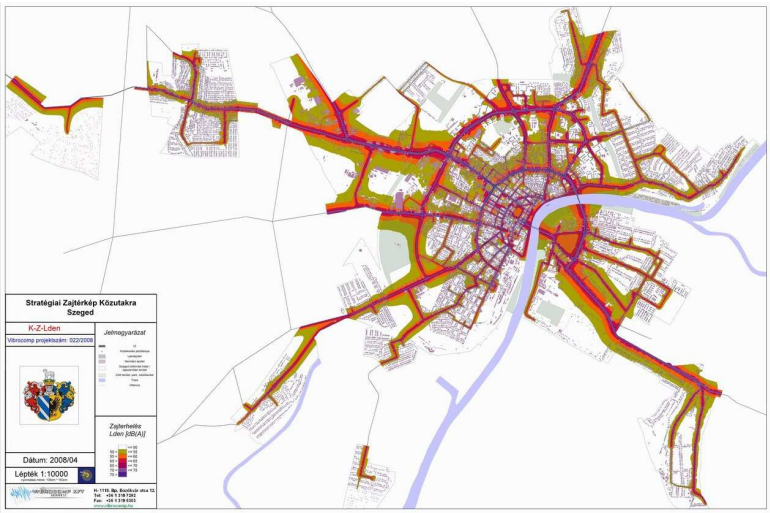

Figure 1. Strategic noise map of Szeged.

From the noise map above the most important conclusions:

- All main roads of Szeged have high noise load
- The huge transit traffic of the IV. European corridor is crossing the city causing high noise levels.
- The main ring road is not finished
- The existing bridges, especially the city center bridge are over loaded

Timişoara, also known as "The City of Athletes", is a large economic and cultural center in Banat in the west of Romania. It is the capital of Timiş County.
Area: 129.2 km²
Population (2008) : 312,400

The traffic (noise) situation in Timisoara is determined by the high traffic on all mayor road leading into the city. Due to the heavy transit traffic there is no significant difference in the noise levels between day and night.

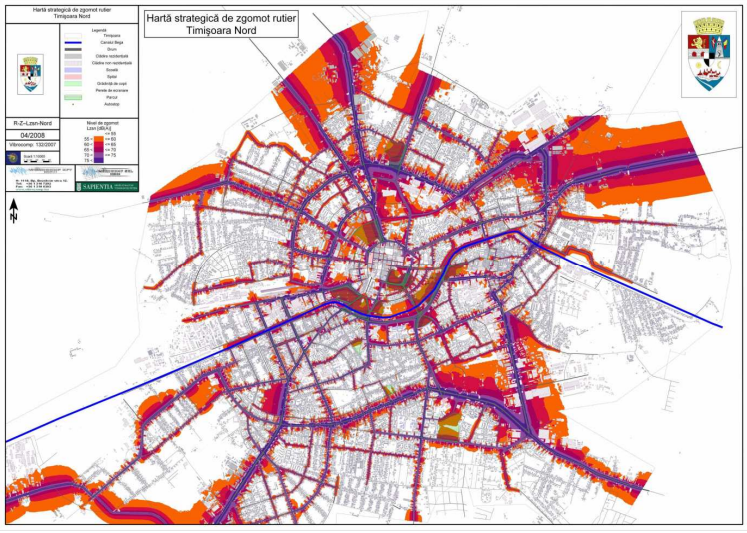

Figure 2. Strategic noise map of Timisoara.

From the noise map above the most important conclusions:

- All main roads leading into the city have high noise load
- Huge transit traffic is crossing the city causing high noise levels.

4. COMPARISON OF THE ACTION PLANS

An action plan can only be effective if it is combined with traffic development plan, city environmental plan, and city development plan. This was the reason to prepare the action plans of both cities according to the city development plans of the two municipalities.

In Szeged the most effective noise reduction plan can be achieved when combinig the following measures:

- Change in the road structure: construction of Highway M43.
- Change in the traffic management: Differentiation between local and transit traffic and HGV ban from the city center.
- Re-pavement of the old roads
- Noise barriers
- Use of low noise equipment for public transport

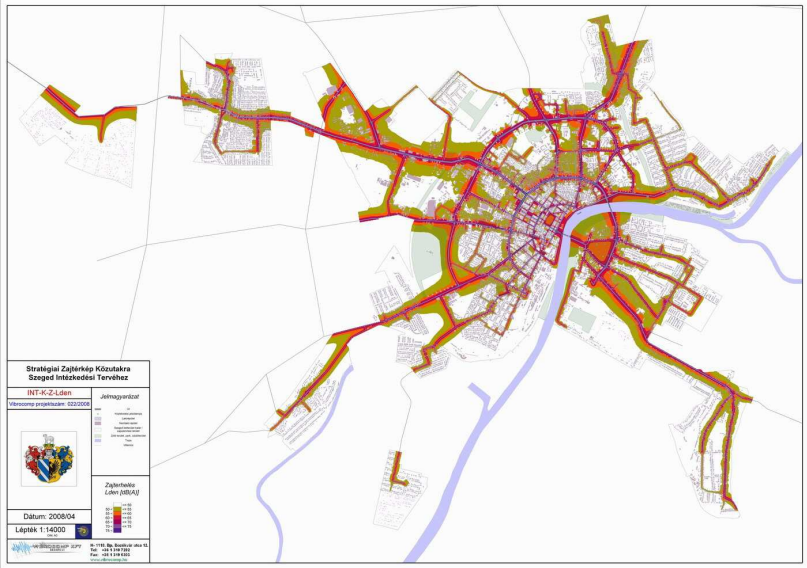

Figure 3. Action plan for Szeged

Comparing the action plan with the noise map of Szeged we concluded, that by implementing the above measures a significant reduction of the areas exposed by 75 dB or higher noise levels is achieved. The number of affected people is reduced in every noise band.

The Timisoara Action plan consisted of:

- Construction of bypass roads, ban of the transit traffic from the city.
- HGV ban inside the ring road only max. 7,5 t, in side Cetate only max 3,5 t.
- Re-pavement of the old roads
- Noise barriers

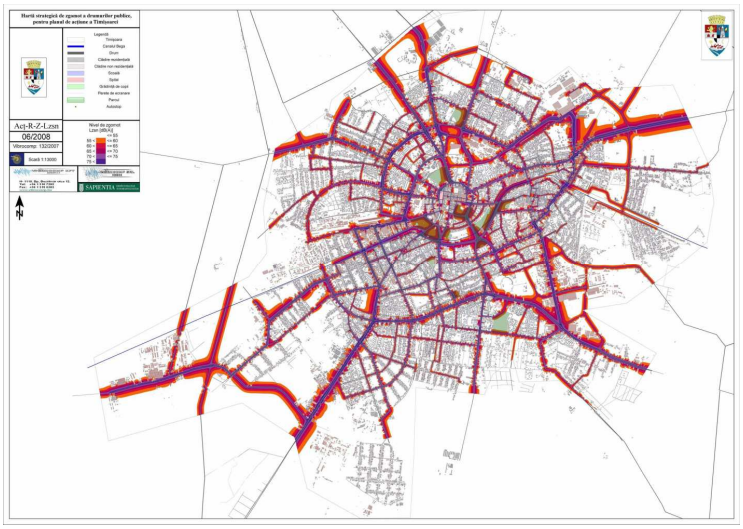

Figure 4. Action plan for Timisoara

Comparing the action plan with the noise map of Timisoara we concluded that after implementing the action plan the noise level of the whole city is reduced by 3-5 dB. In some areas a total noise reduction of over 5 dB is achieved. There is a significant decrease in the number of affected inhabitants.

5. CONCLUDING REMARKS

Effects and results of different planned noise reduction actions can be well illustrated in the noise map and the most efficient method can be selected. Ready noise maps provide a firm basis for future noise reduction plans. Action plans first must consider the origin of the noise load. An action plan can only be effective if it is combined with traffic development plan, city environmental plan, and city development plan. The action plans must therefore be fitted individually to each cities needs!

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