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Budapest Noise Mapping Project II. - Results

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Abstract

The Hungarian capital Budapest, and their agglomeration have recently finished their first strategic noise map. According to the Hungarian noise regulations and to the European Directive 2002/49/EC, this is a legal obligation. The main part of the costs was supported by the EU. The preparation of the strategic noise maps based on a computer model and describing the present noise situation of the municipalities, should be seen as the first step to build a true noise information and management system, based on the computer model initially developed.

It is well known: for accurate noise mapping, topographic, traffic and acoustical informations are essential. The first (and the biggest) problem was: how to get in the accurate topographic and traffic informations for such a big area, how can we use this existing data – or how can we produce the missing data? The assumption of a successful noise mapping project was the excellent cooperation between the different specialities.

The main parameters of the project were:

- the planned area: 1100 km²
- number of dwellings 440 thousand
- length of the mapped roads ca. 2000 km

This paper based on the experience of 23 municipal noise maps - Budapest and other 22 settlements in the agglomeration.

We finished successfully the project in time – the results (all maps) can be found on the internet-page: <http://terkep.budapest.hu/website/zajterkep>

The first paper deals with the technical experiences of the project, the second shows the results of it.

1 Introduction

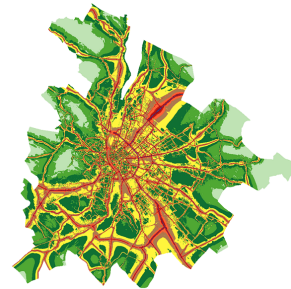
We haven't even finished the noise mapping process when one result could be seen immediately: the environmental noise became the centre of attention. The strategic noise map displays the noise state in such a form that it is a “digestible” piece of information for the mass media and for the public, too. Moreover, seemingly it became one of the favourite topics of media and television in Hungary. The interest towards environmental noise was aroused by this and more attention was drawn to this previously – perhaps undeservingly – neglected area.

Sometimes, as if we can feel that this step was looked forward to. The decibel values and the logarithmic scale are not clear concepts or useful information for the average people. But the colourful noise maps and the data of the exposed population are understandable for everyone. The common people are not interested in the general noise load but in the noise load of their close environment. In case of measurements this demand cannot be satisfied. And then, the complaints come up: Why didn't you measure where I live?! Once was made a presentation in Budapest, where a sample project was introduced. While it was talking about the selected area, one of the secretaries of state at present recognised the place because he lived there. He immediately asked us to show the noise load on that particular area...

Today, with the help of noise maps we can provide information that everybody understands, and we can also satisfy the rightful claims of the people.

Therefore, in my opinion, the first result is in our hands already.

2 Results



The noise map of the Budapest-agglomeration (Lnight):

The noise maps that we prepared in Hungary also include the so-called “conflict-maps” besides the maps showing the immission. It is due to the Hungarian regulation, since it specifies the investigation of the exceedance of the “desirable” noise limit.

To define the limit values in Hungary we determined such values for the indicators of the strategic noise maps that are close to the presently/earlier valid and required limit values related to the noise immission – in connection with both traffic and industrial noise. In order to avoid the confusion of these values by the strategic noise mapping process we called it “threshold value” instead of “limit value”.

Therefore with the noise mapping process not only the immission maps, but the conflict-maps have also been produced.

The maps resulting from the noise calculations were prepared for the capital, Budapest, together with 22 agglomeration dwellings.

While making the calculations we handled the whole agglomeration in a uniform system, that is, in our case the criterion regarding the adaptability of certain dwellings' noise maps to each other was certainly realized.

The noise maps were delivered in both printed and electronic form to the obliged municipalities.

Perhaps the most significant result of the strategic noise maps was – at least until now – that it directed the centre of attention to the protection against environmental noise. The problems existing in Budapest and in the surrounding dwellings have always been basically clear to us, but it was mainly restricted to the buildings situated directly next to the roads.

As a matter of fact, the picture drawn by the strategic noise maps surprised no one – we can also say that there was a single opinion: why did we do it since we have already known that much...

But the following became clearly visible from the noise maps:

- what the exposure of buildings (vagy the exposure of buildings) situated further from the main roads and
- where we can still find silent areas.



Surroundings of the Margaret Island

Moreover, the statistical data of the strategic noise maps presented some more interesting and new informations to both the public and the experts. That is, until now there has not been data available regarding the population exposure.

In order to appropriately understand and evaluate the data we have to add that according to the Hungarian regulation the exposure has to given in the number of people assigned to the most exposed façade.

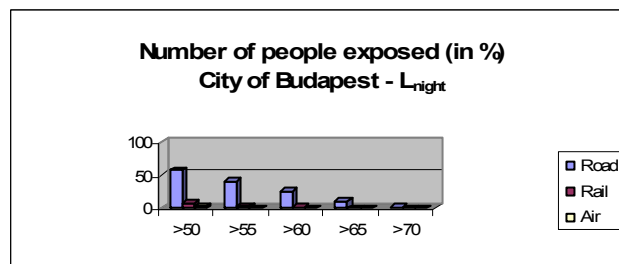
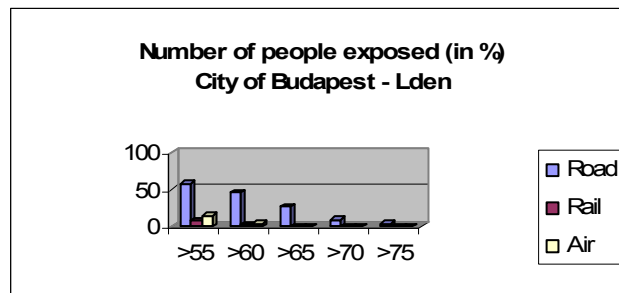
As is generally known this method gives an indicator less advantageous than the actual exposure. Facing these indicators cast light on the problem that the situation is serious, we are in the 24th hour – we have to do something to reduce the noise exposure on the people in the city.

The exposure data revealed very interesting phenomena within Budapest's agglomeration area that at the same time differ from town to town.

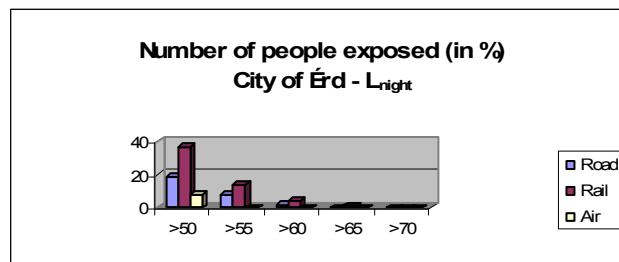
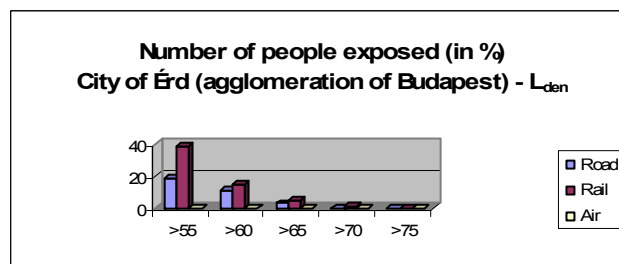
3 The main results of the statistical data

- On the area of the capital (Budapest) the people are mainly exposed to road traffic noise
- 46% of Budapest's population are exposed to greater than Lden > 60 dB noise immission while 40% of the population of Budapest are exposed to

more than Lnight > 55 dB noise immission – shocking data!



- The noise caused by the railway traffic is far less in the capital: 4% of the population of Budapest are exposed to more than Lden > 60 dB noise immission, and 3% of the people in the city are exposed to more than Lnight > 55 dB noise-level.
- However, there are some dwellings in the agglomeration area, where this relation is the opposite. One of them is Érd, for example, where at night twice as many people are exposed to higher than 50 dB noise load of the railway source as in case of the road source.



Such statistical data are very helpful in strategic planning from the aspect that which noise sources have to be concentrated on in each dwelling most importantly and what results can be expected following the interventions.

The situation after Hungary's political transformation is well reflected by the results of the noise maps related to the industrial sites. The industrial activity fell back significantly after the political changes due to the reorganisation of the market and proprietary structure. The old industrial sites – usually working with significant emission – closed down. And the newly constructed industrial factories most often satisfy the related environmental regulations. That's why the environmental noise load caused by IPPC-obliged industrial sites is negligible compared to other noise sources, the population exposure is on the edge of traceability/demonstrability in the whole agglomeration area. (In the investigated noise-level domains the exposure proved to be under 1% in every dwelling.) The question arose therefore whether it is necessary to prepare the relatively very labour-intensive strategic noise maps in case of industrial sites, also since the obligation regarding the reduction of their noise emission is controlled by other means of legal regulations – quite efficiently actually!

4 Unexpected problems related to the publishing and delivery of the information

4.1 Printing needs

We prepared the noise maps separately for the 4 noise-source groups. The maps were printed in a 1:15.000 scale. It was only in the last phase of the project that we encountered the problem of its extremely high printing needs. One set of printed noise maps consists of 133 pieces of A0 sized noise maps. Printing was significant regarding not only the cost aspect but also regarding the time spent on it.

4.2 The problem of informing the public

For the public we provided access to the noise maps through the Internet. One of the problems of displaying and publishing on the Internet was that common people have little general information about the strategic noise maps. For example, what “Lden” indicator covers was not clear, the noise maps were prepared separately for each noise-source groups, etc...

Therefore it was extremely important to draw special attention to giving information prior to viewing. The searcher can only reach the noise maps after reading a short description about them.

Both the immission and conflict maps can be found thematically on the Internet, and the system operates with a street-finder function.

5 Summary – conclusions, suggestions

The strategic noise mapping and the whole new “institution-system” showed the following important

information in Hungary apart from the specific numerical and statistical data of exposure:

- the problem of environmental noise was brought into focus for the decision-makers and the wide public, they deal with the question;
- the problem became manageable and interpretable, the generated database provides opportunity to handle the problem;
- however, the system should “operate” - temporarily the financial framework is not provided, along with defective intention...

Why would this “operation” be good?

For the municipalities:

- we could constantly “actualize” the noise maps, we would not have to be in panic to prepare the new noise maps by the next deadline (2012) as the most significant changes were constantly updated;
- the different projects would be compiled in a uniform system, transparent and coherent data would be connected to each other;
- the accuracy of the strategic noise maps would be under constant and systematic control (some more detailed noise maps could also be prepared);

For the designers, investors

- the presentation about the environmental noise state would follow a clear and uniform system of requirements;
- the measurement of the basic state (present situation) is not disputable, it is already available, it is unnecessary to measure it of certain areas for another time (cost-saving);
- the presentation of the influence could be expanded to the population exposure next to the noise level values (often at certain areas the noise level increases while altogether the exposure can be more advantageous), it has neither been investigated, nor evaluated yet;
- the possible effect of parallelly but independently running projects on each other can also be considered;

For the public:

- people can receive clear, uniform and fast information on the environmental noise immission;
- the opportunity for a complex survey of the effects is given, the available tools to reduce noise and their applicability will also become lucid - the people can be partners.