Nosie mapping in the service of developments
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ABSTRACT
Often noise mapping remains an untapped asset and the colorful posters don’t reach their final destination: the real target user - the residents. They don’t know about it and don’t understand it, although they are the ones who have to be won over the support of the developments. We made several noise examinations besides the strategic noise mapping of Kecskeméť city, e.g. many variations of road network developments, communal transport network developments and public transport fleet improvements. We made noise maps about the main road and collector road networks for all variants in this context. Difference noise maps and eligibility statements illustrated the test results. We presented the results to the decision makers with active expert support. They were convinced about the benefits of noise control so they managed to win the support of the development by residents. We also had residential discussion forums where we presented the expected effects of noise to the stakeholders, and explained the nature of noise reduction and also highlighted to usefulness of the target projects. We measured the actual noise reduction and published comprehensible confirmation summaries to residents. Therefore our colorful posters became noise maps helping us to translate the logarithmic formulas to common language.

1. INTRODUCTION
In Hungary the strategic noise mapping – depending on the size of the city – is an EU obligation. National legislation rarely require to make a noise map for areas different from those specified above. The noise mapping is therefore not sufficiently widespread and its content and possibilities are not well-known.

Above all, however, noise mapping is not an urban planning tool, nor a tool to measure the “liveability” index of a city, and it does not help people to better understand its need. Today’s mobility needs are very high and are even at an increasing rate - in proportion to a country’s development level and GDP per capita as well.

Translated to the field of noise control, this forecasts the growth of noise pollution, which leads to increasing noise conflicts, and an increasing number of affected inhabitants. This plan shrinking world where there is more and more difficult to dodge the effects of human intervention, the noise caused information hunger at residential areas, at decision-makers, country - and land development sides as well. After all, the necessary progress in our time calls for strategic thinking, which must include the environment and noise as well.

By contrast, in daily practice, we see that all the bad urban planning practices ignore these, there is no or incomplete communication, and even the existing strategic plans of action plans compliance and accountability are not working fully.

2. A GOOD EXAMPLE

2.1 The Case study of Kecskeméť city
Kecskeméť city is situated in the country's central region, adjacent to the capital's force field and has 100,000 inhabitants. Motorway connects it to the circulation of the European road network, it has an innovative industry (Mercedes-Benz), so the city is undergoing a dynamic development.

In order to keep pace with the city’s development plan and to become a more liveable place, it has been decided to continue to develop strategic noise mapping based on strategic urban development

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needs. The company selected to do this work was Vibrocomp Ltd. Our company presented the results of the noise mapping to decision-makers in such a way so that they could apply them in the context of real-life needs and strategic action plans based on the possibilities of noise mapping as an indicator - to measure the improvements of the environmental benefits and investment guidelines for shaping.

As a result of common thinking we made several noise examinations based on the strategic noise mapping of Kecskemét city, e.g. many variations of road network developments, public transport network developments and public transport fleet improvements. Practically we made noise maps for the entire city’s main road and collector road networks for all variants in this context. We worked with SoundPlan noise modeling software that we have been using and we are having experience for more than fifteen years.

Difference noise maps and eligibility statements illustrated the test results. The noise was compared to the reference condition.
Thus, noise protection became a prominent subfield of urban development.

3. COMMUNICATION

3.1 Design preparatory phase

The complete communication has to reach two targets; first in the direction of the decision-makers, and second to inform the population – already in this initial phase. We presented the application possibility areas to the decision makers with active expert support to the greatest extent possible.

- Noise mapping = Noise indicator of the benefits
- supports the design
- tool used to get public support

Parallel to the above, we informed the public that within the framework of a comprehensive urban development, the development programs will start with the help of noise mapping tools. It will be suitable to demonstrate how the population can profit if the environmental conditions become more liveable - besides of the transport access benefits.

3.2 Design phase

As a starting point we measured the conflict points; the causes of mobility problems and those of noise conflict. At this point the population has been involved, so they became active participants in this part of the project.

The main focus of noise protection was the following:
- volume of the transit traffic, permanent noise pollution – even during the nights, especially by not keeping the speed limits (trucks with trailer)
- annoying effect caused by noisy passing of the city buses used in the local public transportation

By taking into account all of the above, the following proposals have been submitted: creation of a
bypass road outside the city, inside missing road sections, modernization of the public transport fleet. Proposals including the outcome results have been submitted to the decision-makers as a document and then we presented and explained our proposals in front of the city development designers and the environmental protection commission.

We proposed a specific timeline for the development elements so as to gain the population’s support for the project as soon as possible. As a result, the modernization of the public transport fleet and road networks developments gained priority. Following this step, we focused on the design preparatory phase of the outside city road ring.

By having the support of the decision-makers body, we presented to the population the outcome results and the expected development directions by multiple channels, including written and online media, local public forums, where we had the opportunity to receive immediate feedback on our plans.

Therefore our colorful posters became noise maps helping us to translate the logarithmic formulas to common language.

Owing to this successful process, Kecskemet got bypass roads and now Mercedes-Benz Citaro G Bluetec®-hybrid buses plying – zero emission (electric) mode in the city center. Besides that the gate of implementation are other internal road network improvements – thanks to community support.

The challenges of the inside city road network came to realization and are to be implemented. The noise benefits are illustrated not only by the noise maps but by the eligibility statements below.

<table>
<thead>
<tr>
<th>Number of affected residents (daytime)</th>
<th>without</th>
<th>with</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise level dB(A)</td>
<td>Affected residents</td>
<td>Affected residents</td>
</tr>
<tr>
<td>50-55</td>
<td>3700</td>
<td>3400</td>
</tr>
<tr>
<td>55-60</td>
<td>1600</td>
<td>1500</td>
</tr>
<tr>
<td>60-65</td>
<td>1400</td>
<td>1300</td>
</tr>
<tr>
<td>65-70</td>
<td>800</td>
<td>600</td>
</tr>
<tr>
<td>&gt;70</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>sum.:</td>
<td>7700</td>
<td>7000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of affected residents (night time)</th>
<th>present</th>
<th>future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise level dB(A)</td>
<td>Affected residents</td>
<td>Affected residents</td>
</tr>
<tr>
<td>45-50</td>
<td>2400</td>
<td>2100</td>
</tr>
<tr>
<td>50-55</td>
<td>1400</td>
<td>1300</td>
</tr>
<tr>
<td>55-60</td>
<td>1300</td>
<td>900</td>
</tr>
<tr>
<td>60-65</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>&gt;65</td>
<td>0</td>
<td>0</td>
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<tr>
<td>sum.:</td>
<td>5600</td>
<td>4800</td>
</tr>
</tbody>
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In conclusion within the framework of follow-up care we measured the actual noise reduction and published a comprehensible summary confirmation of residents with the help of the media. Due to our effective expert contribution, the city leaders continue to manage the city by serving the population’s interests and the livable environment.

3.3 How, when, what

Based on our experiences, communication is important throughout the work phases, such as:
- design preparatory phase
- design phase
- follow-up care
The population has an outstanding role in all this besides the decision makers.

The choice of the communication channel depends very much on the targeted audience. It’s indispensable to involve online communication channels besides the conventional media.

Usually, there is only one chance of population participation in the data gathering, because after that interest of population participation decreases. Nevertheless, the continuous update on the progress and results is very important as the information is getting to everybody. Following the closing of the project, the quantified presentation of the results is an important feedback to the stakeholders.

The dialogue has to be explicit. During the design preparatory phase, the direction and scope of the development concept has to be understandable for the population (as no single investment can be self-serving). We have to show that the project elements can be changed, and that we are open to the population’s suggestions.

The nature of changes, the acquired noise benefits are to be translated with the help of examples during the public forums in such a way so that is understandable by all parties. In all cases, we have to show the meaning of change in noise pollution, for example a 3 dB decrease means the traffic flow will be half the volume. Besides that, it is very important to emphasize with eligibility statements how many people’s noise situation became better due to developments’ effect.

4. CONCLUSIONS

With the help of communication tools, which were untapped during the last years, noise mapping might gain broader support and it might become feasible for increased support of city developments. Whenever the project developer wishes to gain population support and at the same time to get time efficient development, he needs to apply for the communicating noise mapping.

REFERENCES