

Barriers to progress?

Why are noise barriers so neglected by the industry? According to R. Kohlhauer GmbH, with a little thought these structures can do much more than at present

Words | **Guido Wolf, vice president, R. Kohlhauer GmbH**

Noise barriers are all around us on the roads. If you are travelling by train, it's the same picture. They isolate us, separating us from the environment, and their function is highly questionable, especially for local residents. And it gets even worse over time. They become dirty, covered with graffiti, and don't even properly fulfill their function.

Acoustic protection is a very subjective, even emotional issue. Noise is always perceived, and a noise barrier raises hopes that noise will be eliminated completely. As such, noise barriers give something of a false image in the market so misunderstandings occur, leading to disappointment all round.

In addition, many investors do not see acoustic protection as an environmental issue, but merely as a means of complying with legal directives and an additional cost. This means that from day one the planning phase begins from a poor perspective, leaving little room for creativity and design. Low-cost standard solutions – such as concrete and aluminum walls – are the designs that characterize our landscape, yet wood and transparent materials offer better solutions.

Projects in Europe have suggested that noise barriers can be integrated into the environment and have the potential to reflect current architectural trends. Recent projects have even indicated that cities competing

Large urban barrier



Green scene

The environment is now very important for road planners. Green noise barriers – vertical vegetation structures – such as the PLANTA system can perform nature-oriented functions in urban areas, while still acting as acoustic protection. This system incorporates planting, acoustic protection, air filtering, and evaporative cooling, and discourages graffiti and vandalism.



for prestigious awards construct noise barriers at crucial entrance points to give the best possible first impression.

If noise barriers are to be successful in terms of acoustic protection, functionality, and aesthetic value, they must be carefully planned from the outset. Acoustic specialists, architects, steel workers, manufacturers of noise barrier elements, contractors, and installation companies must all cooperate, and a dialog between political decision makers, architects, contractors, and end users at an early stage helps to develop the best solution in such cases.

Globally, there are many emerging markets for noise barriers, and the people in charge of these projects, who lack experience in this field, need to be brought up to speed.

Protect and serve

Acoustic protection must not exist simply to promote local party politics, or to get votes around



This barrier features solar technology to help reduce the infrastructure carbon footprint

election time. Rather, it should be perceived as an appropriate environmental method of protecting people from noise.

Acoustic protection must be planned by acoustic specialists who take the environment into consideration and analyze the characteristics of the noise. Many noise barriers are too low, too short, or too far away from the source of the noise. Sometimes buildings, hills, or valleys in the area are not considered, and the noise is reflected, potentially causing noise problems elsewhere.

'Reflection' and 'absorption' are the words that architects should bear in mind as the basics of acoustic protection, the material properties of which must be understood by the architect so that they can be appropriately integrated into the design.

Designs must not be structured for road users alone. The budget is usually too tight to have a good design on both sides of the barrier – it is a paradox that those who cause the noise are provided with the more attractive side. So, the driver rushes past the barrier in a few seconds, whereas the local resident has to suffer the same unattractive view for decades.

Many new material combinations are not used by the architect due to lack of knowledge, and the project is again reduced to questions of cost and functionality. Plus, the quality standard and durability of a noise barrier are not fully exploited. The noise barrier of today is multifunctional.

Acoustic protection is regarded as a construction item by the building industry. Noise barriers are included in the main contractor's budget, and represent a very small part of the total cost of a large

motorway or bridge project. Because noise barriers are one of the last components in the project to be constructed, it is no surprise that they are often subject to pressure from cost overruns. Central, regional, and municipal government funding fluctuations of the project add to this pressure.

Material savings or more simple designs are current solutions to the problem, as long as they meet with the terms of the relevant legal directives. Warranties and guarantees still have to be kept to, but there is no requirement to exceed these. It is just a matter of time before this approach fails.

Last year, €500 million (US\$750 million) was spent on noise barriers in Europe alone. Research shows that 20% of these barriers are likely to show damage after approximately five years. Consequently, €100 million (US\$150 million) will need to be spent on replacements and maintenance each year – and remember, this is just in Europe.

Contractual demands for guarantees of 60 years for noise barriers are misplaced. If noise barriers are still required in 60 years' time, then we have to conclude that the environmental protection initiative originally intended has failed. Noise can be best prevented if it does not arise at all.

The obvious conclusion is that noise polluters need to provide adequate solutions in the very short term. Automotive and tire manufacturers and producers of pavements should participate in this by producing quieter products. Local legal authorities can participate by proposing and enforcing general speed limits. The range of participants in the process is extensive.

A new approach

Innovative designs, such as noise barriers that are transparent yet absorbent, can increase acoustic performance, conform to sustainability agendas, set new trends, and grow the market generally. Designs such as the Point Fixing Support integrate acoustic protection and steel construction elements.

New technologies, such as photovoltaics, are already successfully integrated into acoustic protection modules today, as can be seen in the VOLTA system by R. Kohlhauser GmbH, based in Germany.

These are new solutions that will stimulate the development of acoustic protection, and are innovative and non-polluting. As the market develops, acoustic protection will integrate further functions into one unit.

New modules are already in the planning stage – modules that are at a reasonable price level, have a long lifespan, and provide a balance between criteria of materials usage, resources, and demand for energy.

Companies such as Kohlhauser are intensively involved in the application of innovative, integrated approaches on a global basis, and are investing in new technologies and services. Future opportunities are best solved by a system-based culture.

Modern noise barriers are increasingly becoming high-tech function walls, and noise, solar energy, and landscape engineering are trends that are increasingly being focused upon. Only the integration of different industries' solutions can cover these requirements by a 'design-and-build' approach.

At the same time, the global approach is increasing in importance. Noise occurs mainly in large urban areas, so acoustic and environmental concepts can be best solved in cooperation between the largest cities in the world.

Medium-sized private companies, with their limited, local approach, will not be able to handle acoustic problem-solving of the future. Harmonization of markets, accepted standards, safety, and environmental legislation when combined with the demands of using different technologies as one to fulfill demanding financial/economic requirements requires the commitment of organizations with a one-world reach, attitude, and expertise.

Noise barriers are not an interim solution, but rather the beginning of a new generation of sustainable and multifunctional elements in the environmental protection sector, providing much more than just acoustic insulation. ■