Noise barrier characteristics with change in road traffic noise

Ryuji Inoue, Head
Hiroshi Yoshinaga (Ph.D. (Engineering)), Senior Researcher
Keiko Ohkouchi, Researcher
Road Environment Division, Road Traffic Department

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1. Introduction

Various measures (Figure 1) are used by road administrators to suppress road traffic noise. A noise barrier is one of these measures. Although its performance does not degrade over time, and there is no need for replacement, we still need to consider that it will deteriorate in the same way as other structures. On the other hand, vehicle noise regulations will be tightened in stages[1)], and it is expected that road traffic noise will be reduced. At the NILIM, we study the most appropriate future characteristics for a noise barrier, considering the previously mentioned situation.

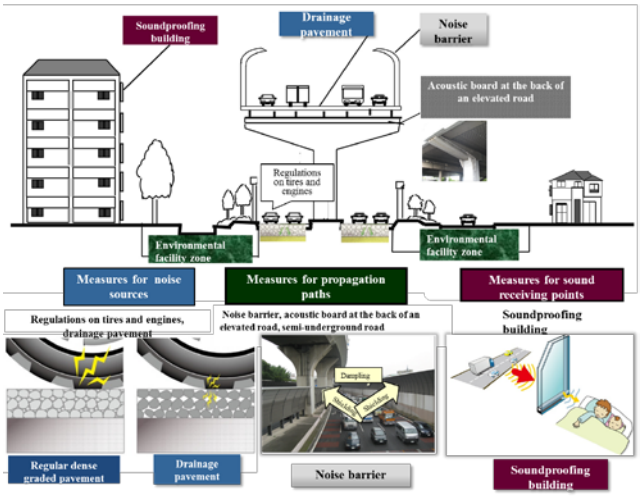

Figure 1 Schematic diagram of road traffic noise measures

2. Status of noise barrier maintenance

Many national roads under direct control utilize noise barriers with metal sound insulating boards, as shown in Photo 1, and some areas contain noise barriers with transparent sound insulating boards, as shown in Photo 2[2)]. Each road administrator has their own installation and maintenance criteria based on the design criteria of NEXCO. A repair is performed when damage by a third party is expected. An update is performed only to restore parts damaged by an accident to their original state; therefore, it is possible that new and old insulating boards will be mixed, and the sense of unity will be lost in the landscape.

3. Influence of tightening vehicle noise regulations

According to a report by the Central Environment Council[1)] (July 30th, 2015), the acceptable limit of acceleration running noise will be tightened in stages in 2016 (Phase 1) and 2020 (Phase 2). In addition, an acceptable limit for tire noise will be introduced, and it will be applied to passenger vehicles in 2018, small trucks in 2019, and medium-sized and large-sized vehicles in 2023.

We are examining a way to properly predict the influences of these regulations on road traffic noise.

4. Examination of future noise barrier characteristics

We would like to organize the technical issues and examine the future policy by considering various scenarios for changes in road traffic noise and the future characteristics of noise barriers.

Photo 1 General noise barrier (metal sound insulating boards)

Photo 2 Transparent noise barrier (transparent sound insulating boards)

☞References

1) Central Environment Council, Section of Air, Noise and Vibration, Special committee for vehicle noise, “Future measures to reduce vehicle noise” (The third report) (in Japanese)
https://www.env.go.jp/press/files/jp/27682.pdf

2) Technical Note of NILIM, No. 788 “Research on landscape assessment and case studies for road noise barriers”
http://www.nilim.go.jp/lab/bcg/siryou/tnn/tnn0788.htm