



Conférence Européenne
des Directeurs des Routes
Conference of European
Directors of Roads

SOPRANOISE

CEDR TRANSNATIONAL ROAD RESEARCH PROGRAMME Call 2018

Securing and Optimizing the Performance of Road trAffic NB with New methOds and *In-Situ* Evaluation

Project summary

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SOPRANOISE (Securing and Optimizing the Performance of Road traffic NB with New methods and *In-Situ* Evaluation) addresses new tools to assess acoustic performances of Noise Barriers (NB) as they are effectively used along road networks¹.

The project targets at improving how to assess acoustic performances, not only after NB installation, but also throughout their whole lifetime. The primary aim is to develop innovative quick and safe methods to easily characterize installed NB *in-situ*, with the clear intention to submit those methods to CEN for standardization. Once generalized, they could then be used to characterize NB in a more systematic way than what is possible today. This research will also provide key information to infrastructure administrators for planning, procurement and lifetime management of NB, mastering how NB reduce noise within a long-term perspective.

SOPRANOISE will focus on the following issues:

- **State of the art of the acoustic performances of existing NB:** relevant database of the European NB market, including manufactured products and already installed NB; this database will summarize facts and figures about NB acoustic performances in different testing conditions, i.e. following both diffuse sound field and direct sound field standardized methods, together with a better understanding of the respective significance, similitudes and differences of those methods.
- **In-situ inspection tools:** to characterize installed NB, an innovative *progressive approach* is proposed: (1) *in-situ inspections* – (2) *quick methods* – (3) *full methods*. The fastest tools are *in-situ* inspections (visual and aural): this research will demonstrate up to what extent such inspections can yield fair conclusions on the NB acoustic performances. Theoretical models will be built to understand the effect of weaknesses and leakages on airborne sound insulation / the global effectiveness of NB, as well as the effect of degradation of sound reflection. The developed tools and models will be validated *in-situ*.
- **Quick and safe methods to be used alongside roads:** this is the major challenge of this research: to be able to *easily characterize* installed NB. Such methods are crucial for the infrastructure administrators who have to maintain the acoustic performances of the NB all along their lifetime. Simple, fast and cost-effective tests could allow them to carry out much more systematic checks than those with the existing EN1793 standards.
- **In-situ validation:** during the validation phase of the “quick methods”, the *in-situ* inspection tools will be investigated, checked, validated and improved in order to develop effective tools for “on-site conformity check” wherever along a newly built NB.
- **Effect of the acoustic degradations of NB:** already considered hereabove (inspection tools), this effect on the global NB performance will be carefully considered and documented to objectively understand the long-term ability of NB to reduce road noise.
- **Practical Guidelines on NB:** this will be a major *output* of the research; the guidelines will not only assemble the results of this research in a comprehensive manner, but will also provide a much wider guidance about the way to consider NB as powerful tools to reduce noise, all of this from NB planning, design and procurement, to control, use and maintenance phases within a long-term perspective: this will be summarized in suitable formats for NRAs and policy makers, as well as for the scientific community.

A **dedicated website** (through ERF network) will be used to promote the outcomes of this project to NRAs, other stakeholders, the scientific research community and the wider public.

A **final event** will be organized as a CEDR or TRA activity, and the **methods will be submitted to CEN TC226/WG6 (roads) and TC256/SC1/WG40 (rail) for standardization.**

¹ for instance, the outcomes of this research will be useful for both road and railway NB