

*PPP: Proposition of Possible Project title:*

**Road acoustic barriers infrastructure maintenance, planning and development**

**RABIMPAD**

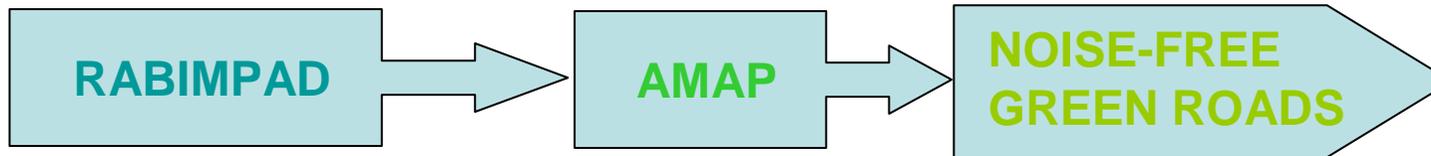
**on the base of innovative vibro-acoustic control of their efficacy**

*Projects' Proposition Author: dr Zbigniew Motyka (GIG, Poland)*



GŁÓWNY  
INSTYTUT  
GÓRNICICTWA

*Wirtualne zarządzanie procesem efektywnego planowania, dyslokacji i utrzymywania infrastruktury ekranów drogowych, na bazie innowacyjnej wibroakustycznej kontroli celowości i efektywności ich zastosowania*



Due to rapid development of this particular road infrastructure, the necessity arises of developing of new complex and possibly universal, open for new constructional solutions, system for acoustic barriers replacement and development, but also removing when unnecessary, including final waste management and possible recycling, which would start from *in situ* measurements, virtual simulations, and lead toward effective planning, scheduling and performing, via formulation of validated indices for necessary measures in aim of achieving more friendly for environment, **(as much as possible) AMAP toward future noise-free green road transporting system.**

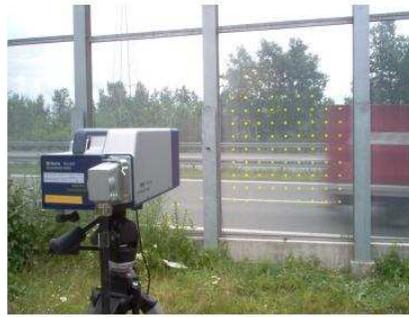
## Main Tasks:

## RABIMPAD

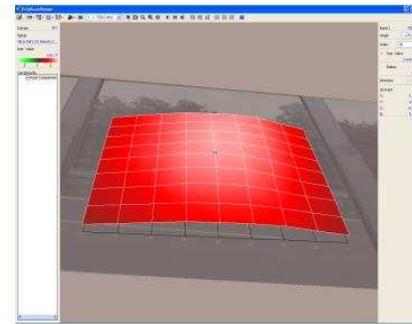
- Vibro-acoustic control of existing and suitably (within frames of virtual modelling) modified various types of road sections (single panels) of acoustic barriers
- Simulation of efficiency of fully developed existing (for comparison and validation needs) and projected acoustic barriers infrastructure, including advanced predictive modelling for built from these sections long curved barriers following road curvature
- Development of vibro-acoustic models of existing and suitably modified various road sections (single modular panels and their complexes) of acoustic barriers
- Providing true and simulating acoustic maps for existing infrastructure of road acoustic barriers
- Providing simulating acoustic maps for planned infrastructure of road acoustic barriers
- Providing rationales & guidelines for cost-effective, advanced, quick, cost-effective and flexible (modular) designing of efficient deployment r&r acoustic barriers.
- Development of final virtual designing method of road acoustic screens efficient deployment



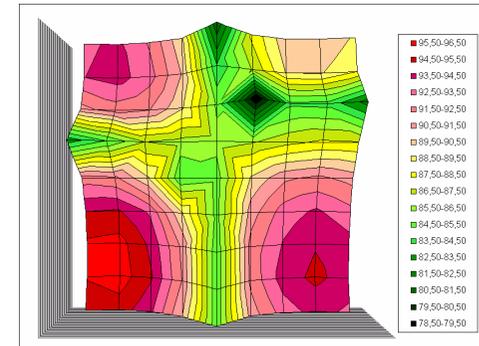
(a)



(b)



(c)



(d)

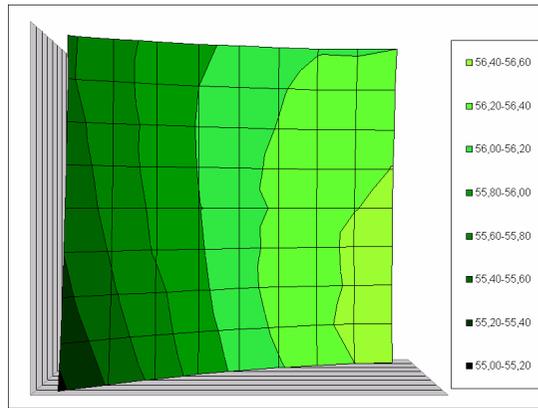
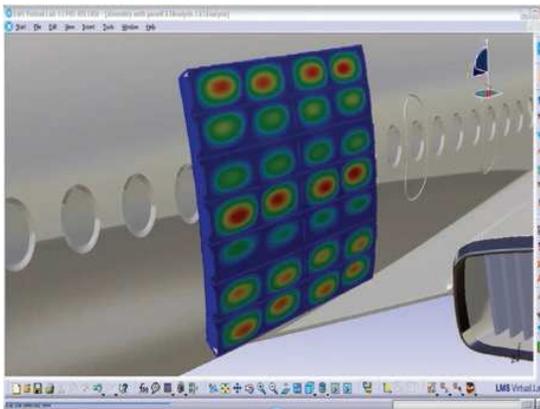
Image (c) of surface acoustic screen vibrations obtained by GIG during *in situ* tests (a) using Laser Doppler Vibrometer Polytec PSV-400 measuring system (b).

Noise map calculated behind a single *in situ* road panel (GIG)

# The progress assumed by **RABIMPAD** PPP beyond the actual state-of-the-art



<i>Hitherto state-of-the-art</i>	<i>The state after implementing <b>RABIMPAD</b> ready-to-use products</i>
The standard acoustic maps are performed before and after installation of systems of acoustic barriers, and (for main roads and major agglomerations only) with frequency of standardised 5-year periods. They are performed for checking general effectiveness of barriers in comparison with a state without them.	The special dense <b>simulated</b> acoustic maps will be performed in regular periods of areas directly adjacent to a line of acoustic barriers (in their direct vicinity, for all their lengths).
Lack of continuous and systematic basis monitoring of existing systems of acoustic barriers efficiency (accidental only).	Continuous tests of existing acoustic barriers low-frequency excessive vibrations, with the use of innovative remote opto-electronic (laser) sensors of vibrations.
Accidental, therefore often unnecessary actions or, on contrary, too late and not always cost-effective applied development measures.	Cost-effective acoustic barriers infrastructure efficacy (as a whole) simulations, for replacement and/or development planning and organisation on the base of set of rational indices developed.



**LMS Virtual.Lab Acoustics** and **GIG**  
sound transmission calculations through acoustical panels toward

*Alicja (Mia Wasikowska)*  
AMAP green noise-free roads.