Bonneagar Iompair Éireann
Transport Infrastructure Ireland

TII RESEARCH

RESEARCH PROJECT TITLE: TESTING, MODELLING AND OPTIMAL DESIGN OF NOISE BARRIERS FOR IRELAND

START DATE: **October 2010**	END DATE: **September 2012**

CONTRACTOR: Trinity College Dublin

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DESCRIPTION: A recent post-EIA noise evaluation study, highlighted a number of issues associated with how noise mitigation measures are designed and implemented on national road schemes. The level of mitigation achieved by some of the current noise barriers designs is often significantly below the required performance standard and the benefits of such a barrier may not be perceived by the human ear. This is primarily related to the fact that suitable detailed analysis tools have not been identified for the detailed design of noise barriers to the required ISEN standards. These standards specify certain acoustic and technical performances which are assessed by the use of tests, conducted in a laboratory environment and invariably, these tests are not appropriate for on-site testing. Therefore, current practice does not address installation effects such as topography, profile details, frequency response, material density, etc.

OBJECTIVES:

- To use the research findings to develop a guidance document for future design of noise barriers
- To develop a robust, in-situ method for determining the acoustic performance of barriers that may be implemented on site in an effective manner

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BENEFITS: This research will ultimately result in a guidance document for future design of noise barriers, in addition to the development of a robust in-situ method for determining the acoustic performance of barriers that may be implemented on site in an effective manner. Such a methodology will have substantial impacts on site as it will result in improved design of noise mitigation measures.

RESEARCH FINDINGS:

- A state of the art new guidance document was published for the design of noise barriers for transport infrastructure
- It was possible to extract impulses using traffic noise as the source. It has been demonstrated that one can measure the sound insulation performance of a noise barrier using a "quick look" method and the qualitative agreement between the two methods is generally reasonable for low frequency measurements
- Achieving quantitative agreement between the two methods is more difficult due to the fact that different test sites require different correction factors. The calculation of correction factors can be achieved. However, this would require a number of additional on-site tests and as a result, the method no longer becomes a "quick look" method. Furthermore, even if a correction factor was easily calculated, the robustness and repeatability of this technique is poor
- This method also relies on traffic to generate the noise source; it is difficult to achieve a sufficient signal to noise ratio at higher frequencies

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