

Railway noise and vibration: mechanisms, modelling and mitigation measures

David Thompson

Abstract

Railways are an environmentally friendly means of transport that offer many advantages for sustainable development. However noise and vibration remain a major reason for objections to new lines or expansions of networks. Railways will never be silent. Nevertheless, it is clearly important to reduce their noise and vibration as much as possible while not adding unnecessary cost or complication to their construction and operation. To achieve this it is essential to understand the mechanisms of noise and vibration generation and the parameters that can influence them in order to propose cost-effective mitigation measures. Theoretical models are an important part of this process. It is important that such models are of sufficient detail to cover the most relevant parameters in a reliable way, but not over-complicated in order not to lose insight. This approach of developing appropriate models for the purpose of designing mitigation measures is illustrated through several examples: rolling noise, ground vibration and aerodynamic noise.

David Thompson, Professor of Railway Noise and Vibration, Institute of Sound and Vibration Research, University of Southampton

Biography

David Thompson has a degree in Mathematics from the University of Cambridge and a PhD from the ISVR, University of Southampton. He worked at British Rail Research in Derby, UK and TNO in Delft, the Netherlands before joining ISVR in 1996 where he is now Professor of Railway Noise and Vibration and head of the Dynamics Research Group. His research covers all aspects of railway noise and vibration including rolling noise, curve squeal, impact noise, ground vibration and aerodynamic noise. He is the main author of the TWINS program for rolling noise. He has written over 120 journal papers and his book on Railway Noise and Vibration was published in 2008.