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Ground vibration requirements in vehicle projects

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The climate is right for trains and the environmental targets regarding noise and vibration have to be met to enhance the competitiveness of rail over other forms of transport. Ground vibration is one part that needs to be further addressed.

Customer requirements on ground vibration are often included in vehicle contracts even if the vehicle is only one part of the system determining the ground vibration at the receiver point. For the design of new lines there is a need for a better optimization of overall generation of noise and vibration where both the infrastructure and vehicle parameters are included.

An overview of the diversity of ground vibration requirements in different vehicle projects is given and the relation to a number of vehicle and track parameters. The potential conflict between ground vibration reduction and increased airborne noise generation is analyzed for particular examples.

The background analysis clearly points out the need for a standardization regarding both setting and evaluation of requirements. There is also a need for developing one commonly used, widely accepted, validated prediction tool for ground vibration. It should facilitate engineering level decision making and allow assessment of mitigation measures.