

MATHEMATICAL MODELS FOR THE PROPAGATION OF GROUND VIBRATION FROM TRAINS

A number of mathematical models have been developed for the prediction of the propagation of ground vibration from trains. The behaviour of different track designs in combination with the ground properties and structure are encompassed by these models. The aims of this work are:

- To develop the understanding of the mechanisms of ground vibration propagation in order to produce well-founded ideas for attenuating it.
- To enable the evaluation of possible engineering solutions to the problem before they are tried experimentally. In this way any experimental construction can be designed to give optimum results and unproductive designs can be avoided.
- To provide information on the possible presence of high levels of ground vibration at particular sites, for instance where a new railway is proposed.

Two-dimensional models have shown the importance of the layered structure of the ground, but these models cannot support an adequate model of the track. A three-dimensional model which includes a better model of the track has proved useful in a track design study but only includes the ground as a homogeneous half-space. A three-dimensional model which includes a layered ground has been devised but calculations from it are limited, at present, by the power of the computing facilities available.

Recommendations are made concerning the direction this work should take in the immediate future.