

Vehicle-Track Interaction



Background

The contact between wheel and rail on British standard gauge mainline rail is about 250 mm².

Understanding the relationship where this contact is made is central to being able to improve the condition, maintenance and life of the wheel/rail assets and is at the heart of the physics of the operating costs in energy and asset management.

The Challenge

In Britain, the responsibility for managing the issues at this 250 mm² interface is shared between different companies, those responsible for the rail (the infrastructure) and those responsible for the vehicles (the train owners and operators).

The key to bringing about improvements, cost reductions, and business performance enhancements to everyone is to establish consensus between all parties involved.

Challenges around vehicle/track interaction (VTI) include:

- ▶ helping rail operation to cost less by improving safety
- ▶ understanding adhesion, wheelsets and rail wear and damage
- ▶ improving understanding of the micro-interface eg rolling contact fatigue (RCF)
- ▶ developing understanding about the macro-interface through fundamental research and modelling
- ▶ appreciation of how VTI issues affect other systems like electrical conductivity of the contact patch affecting the integrity of signalling systems
- ▶ safety performance in the event of an accident.

How We Can Help

We can help you through:

- ▶ sharing cross-industry research and development specifically on VTI matters
- ▶ delivering standards – technical expertise on VTI matters.

in association with





Vehicle-Track Interaction Strategic Model (VTISM)

VTISM is a strategic asset management suite of software. It provides a system-wide approach to evaluating changes to the vehicle/track interface efficiently.

VTISM links inputs, such as track and vehicle characteristics and outputs, such as rail life, wheel life and maintenance regimes, to predict the impact of system changes on both vehicle and track costs. This helps optimise design and maintenance and whole life costs.

Savings have been realised by using VTISM in the tender evaluation for the InterCity Express and Thameslink rolling stock projects, strategic business planning for track maintenance and renewal, and evaluation of track access charges.

Whole Life Rail Model

The Whole Life Rail Model (WLRM) is an established world leading tool for predicting rolling contact fatigue (RCF) and wear damage and is used to target maintenance on the rail network and in the procurement process to assess vehicle performance. It forms part of the Vehicle Track Interaction Strategic Model (VTISM).

The WLRM damage parameter has been validated on many sites with high levels of rail RCF damage and has given consistently dependable results.

in association with

