Serco is a leading provider of Asset Management services to the Rail Sector. Our team helps stakeholders understand the impact of different train designs and track maintenance and renewal strategies on whole life costs.

The Vehicle Track Interaction Strategic Model (VTISM) was developed by Serco Rail Technical Services, DeltaRail Group and the University of Huddersfield as part of contracts funded by RSSB and Network Rail and endorsed by Vehicle/Track System Interface Committee (V/T SIC).

The model links inputs such as; track and vehicle characteristics and asset management strategies to outputs such as; track component life and infrastructure costs. This can enable substantial savings to be made by optimising maintenance programmes and predicting the impact of changes to subsystems on the vehicle-track system.

VTISM has integrated existing proven track and vehicle deterioration modelling through the Track Strategic Planning Application (vertical damage and associated maintenance and renewal costs), vehicle dynamics software and Whole Life Rail Model (rail wear and rolling contact) packages.

**The scope of the VTISM Stage one includes:**

- Development of a robust approach to modelling plain line, integrated rail ‘Rolling Contact Fatigue’ (RCF) and wear determined by the Whole Life Rail Model (WLRM)
- Significant improvement in the modelling of Switches and Crossings (S&Cs) based on track component condition
- Revised track maintenance simulation to provide increased modelling flexibility
- Simplified use through a single program with Graphical User Interface (GUI), user guide, help facility and training
- Full testing and validation programme.
Since its release to the industry in 2006, VTISM has become an important tool for the GB Rail Industry, maintaining a world lead in track and wheelset deterioration modelling and whole life costing. Serco plays a key role in supporting the growing user base in delivering benefits from the software.

The benefits of using the VTISM include:

- The ability to model and analyse significant VTI-driven issues
- Provision of more accurate predictions of costs associated with plain-line and Switches and Crossings
- The ability to model more closely current engineering practice and provide improved cost estimates for track maintenance
- A significant improvement in productivity, through considerable reductions in analysis time.

Stage two developments include:

- A new Wheelset Management Model (WMM) which provides VTISM with an enhanced capability to model the impact of changes on wheelset related maintenance and renewal costs, thus allowing the optimisation of whole-system costs
- Software usability improvements
- Additional routes (i.e. commuter routes as well as existing high-speed routes)
- Updating of the underlying track asset data, unit costs and vehicle library
- Improved modelling of rail defects, inspection and repair activities.

Acknowledgements

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