

## Development of Integrated Wear-Fatigue-Lubrication Model for Assessment of Rail-Wheel Degradation and Operational Risks (R3.107)

### Background

Enhancement of rail and wheel life is extremely important to the rail industry. Rail defects, rail breaks and derailments cost huge amounts due to cancelled/delayed traffic, emergency maintenance, loss of assets, loss of revenues and liability compensations due to down time. It is important to study the interaction of factors behind these problems, monitor those factors and find out technological solutions to reduce or eliminate those problems for enhancing rail and wheel life and reducing operational risks

### Objective

The project aims to develop a decision model based on predicted operational risks, with a view to establish economic strategies for lubrication and grinding, inspection and rail replacements.

### Outcomes

The main objectives of this project are the development of integrated wear-fatigue-lubrication models for predicting degradation for various curves, tonnage and traffic conditions, and the development of economic models and risk analysis for informed strategic decisions related to rail/wheel maintenance decision and operational risks.

### Benefits

The outcomes of this research will be useful for informed strategic decisions in inspection, maintenance, rail grinding, lubrication, speed limit, axle load, traffic levels, wear limit and rail replacements. Estimated savings to the Australian rail industry could be of the order of \$5 million per year.

### Project timeframe

1 January 2008 to 31 December 2009