



Constraint modelling of railway system

RailNet: Unlocking freight capacity for rail logistics.

Produced within SMART Infrastructure Facility's Rail Logistics Laboratory, the Constraint modelling of railway system project involves the development of a simulation freight model, RailNet. This model intends to provide the Port Kembla Port Corporation and collaborating partner organisations with a tool to simulate the NSW rail network serving the port of Port Kembla.

The model identifies new freight paths available in the rail network leading to the port following the inclusion of all passenger trains. Using the tool, opportunities to maximise freight throughput have been discovered, allowing for predetermined and ad hoc network availability. This process has involved freight paths scheduled to run with minimal dwelling/staging, and synchronised with the operations of Port Kembla Coal Terminal.

As part of the development, it was identified that the model must be able to accommodate dynamic system changes resulting from freight operating parameters, other operators, and RailCorp. Thus it provides the Port Kembla Port Corporation, as well as users of the rail network, the ability to quantify the capacity of the rail network to provide sufficient access to the port, imperative before any commitment of capital expenditures for infrastructure upgrades at the port.

This project typifies the research portfolios of the Rail Logistics Laboratory, including:

- Society and human dynamics for railway systems (RS)
- Commercial sustainability and resilience for RS
- Business life cycle for principle asset
- Technology and knowledge transfer
- Policy and evaluation

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