



Rail corridor and freight analysis in the Limestone Coast region using TraNSIT

Application of CSIRO's Transport Network Strategic Investment Tool to identify potential benefits and implications from rail reinstatement in the Limestone Coast and South West Victoria

Photo: disused rail line near Mt Gambier

The region encompassing the Limestone Coast and South West Victoria has a large diversity of agriculture and forestry, including dairy, grains, cattle, sheep, horticulture and viticulture. Transport of these commodities in the region is by road and includes many movements between South Australia and Victoria. CSIRO applied its Transport Network Strategic Investment Tool (TraNSIT) to investigate the feasibility of a hypothetical reinstatement of the rail line between Mount Gambier and Heywood, and between Mount Gambier and Wolseley – separately and combined.

Project methods

The first stage of the project established a baseline for existing road freight movements for the Limestone Coast region, including supply chains that start, terminate or pass through the region. This involved significant local stakeholder engagement and data collection, followed by a process of mapping the current supply chains for key commodities; modelling the transport costs; and reviewing and validating the baseline through meetings and workshops with numerous stakeholders including producers, processors, transport operators and local government.

The hypothetical reinstated rail link for both the Mount Gambier to Heywood and Mount Gambier to Wolseley rail lines were defined. Commodities and supply chain paths that would benefit from the rail line reinstatement were identified, along with transport cost reductions by use of rail. The analysis considered intermodal requirements and related costs. Different train configurations were considered, as well as alternative supply chain paths through links with existing rail networks. The project utilised TraNSIT, which was already set up for agriculture, forestry and fuels, but was extended to include some of the other key commodities produced or used in the Limestone Coast region. Key industries considered included forestry and wood products, dairy, grains, pulses, livestock, wool and horticulture.

Project outputs

For the current road baseline, rail baselines and each scenario, we produced:

1. Total transport costs/reductions and costs/reductions per tonne disaggregated by commodity, transport mode (road, rail) and vehicle class (configurations aligning with PBS classes 1, 2a, 3a and 4a) or train type.

2. Pinch point analysis for road transport, identifying locations where changes may improve productivity
3. Freight density maps for the road and rail network into and through the region including destinations disaggregated by commodity, major freight path and vehicle type.

Key findings

Road baseline and pinch point analysis

- 527,000 single trailer-equivalent vehicle trips use at least part of the region's network, equating to >9 million tonnes of product annually – (for commodities in TraNSIT)
- the forestry industry is significant - more than half the freight task
- trips that originate in the region comprise half of the supply chains, averaging a distance of 195km and cost of \$23.10/tonne
- trips destined for the region comprise 40% of the supply chain, averaging a distance of 191km and cost of \$23.29/tonne
- through-trips are dominated by trips passing through the northern tip of the region via the Dukes Highway
- A number of 'pinch points' were also identified - road sections that carry a significant share of the region's freight task, presenting an opportunity for improvement.

Scenarios examining rail line reinstatement

- the rail link through to the eastern states offers an opportunity for reduced transport costs for some supply chains
- there are sufficient movements across the year to meet the service demand
- some commodities have relatively short distances to the current market however rail may provide a suitable transport mode for new, more distance markets
- distance to the rail load facility for some commodities is a limiting factor - this could be addressed through loading sidings along the line leading to lower transport costs

- moving commodities from road to rail would result in a reduction in carbon dioxide equivalent emissions
- a reduction in costs for movement by rail as opposed to road were seen for: dairy products, grain, post-processed foods, paper products, wool and horticulture.
- The impact of a potential new industry was also examined. This hypothetical food processor processes locally grown, high value horticulture from properties within a 200km radius of the facility; with the capacity to process 10,000 tonnes per annum, providing additional freight for the Heywood rail service. TraNSIT modelling determined cost of product movement by rail would be \$93,076 p/a less than the total costs of transport if moved by road only, representing an overall reduction of \$18.62 per tonne.

What is TraNSIT?

CSIRO's Transport Network Strategic Investment Tool (TraNSIT) is a computer-based application that performs a mass optimal routing of vehicle movements between thousands of enterprises, and scales up to provide industry, domain or locality wide logistics costs. This provides the ability to test infrastructure scenarios that reduce transport costs for up to thousands of enterprises nationally or within a region. TraNSIT accounts for features and costs associated with transport of a commodity across the road/rail network. TraNSIT has been applied to about 98% of agriculture and forestry transport in Australia including beef, grains, cotton, pigs, dairy, horticulture and rice. More recently it was extended to fuels and minerals for parts of Australia. The tool has been used to test the benefits of road and rail upgrades, transport-related regulatory changes, as well as new intermodal or processing facilities.



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