



ACRI Rail Knowledge Bank update

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Environment

[GHG-emission models for assessing the eco-friendliness of road and rail freight transports](#)

In order to assess the environmental impact of road and rail transports, researchers have formulated very detailed microscopic models, which determine vehicle emissions precisely based on a vast number of parameters. They also developed macroscopic models, which estimate emissions more roughly from few parameters that are considered most influential. One of the goals of this paper is to develop mesoscopic models that combine the preciseness of micro-models while requiring only little more information than macro-models.

High Speed Rail

[Accessibility impact of proposed Australian high speed rail](#)

Using one of the several alternative HSR alignments proposed for the South-Eastern Coast of Australia connecting Melbourne, Canberra, Sydney and Brisbane, this study assesses the regional accessibility impacts of Australian HSR system by means of four indicators: location accessibility, economic potential accessibility, daily accessibility and commuting accessibility.

Human Factors

[A cross-modal risk analysis of substance impairment](#)

This report provides an assessment of the relative risk of fatalities across transport modes, where alcohol and drug impairment are contributing factors in accidents and estimates of the social cost of fatalities associated with drugs and alcohol. These estimates are based on domestic and international rates of fatalities associated with substance impairment.

[An assessment of studies of human fatigue in land and sea transport: fatigue in transport II](#)

Despite technological developments, human operator fatigue continues to threaten safe transport by road, sea, rail and air. The current Institute of Transport Economics Norway, report hopes to help improve research progress and application by reviewing research on fatigue in operators working in road, sea and rail, and assessing its quality (i) in relation to a broad operationalization of fatigue; and (ii) by structuring the findings using a fatigue-risk trajectory. The review finds that while the focus of studies is influenced by the transport sector of interest, there is good coverage of the effects of working time on sleep, sleepiness and experienced fatigue.

[Clear heads: options to reduce the risks of alcohol- and drug-related impairment in aviation, maritime and rail](#)

The true extent of any problem with alcohol or drug impairment in the New Zealand aviation, maritime or rail sectors is unknown. The experience in other countries suggests that alcohol and drug impairment is widespread across all types of transport, with an associated social and economic cost. International data on the number of fatalities linked to impairment from alcohol or drugs is reasonably consistent for the recreational maritime sector. Estimates of the impact on the number of fatalities are much lower in the highly regulated aviation sector.

Infrastructure

[A decision framework for advanced construction technology adoption](#)

The purpose of this paper is to present a framework for the adoption process of new advanced technologies in transport infrastructure construction. Ten construction industry practitioners including railway, tunnelling and earthmoving contractors discussed a total of twenty one technologies ranging in cost from \$0.75M to \$45M, including drilling rigs for bridge construction, blind bore shaft drills for rail development and advanced tunnel boring machines (TBM).

[A study of the potential for dedicated freight infrastructure in Australia](#)

This project concerned access to major Australian container ports only - Sydney, Melbourne, Brisbane, Adelaide and Fremantle. The term 'dedicated freight land transport infrastructure segments' has been interpreted broadly. Part B consists of the two case studies: 1. a new road link between the Port of Melbourne precinct and the West Gate Freeway, and 2. a new rail link between the Port of Brisbane and the Surat Basin, which would carry coal and containers. It should be noted that these are concept projects specified for the purposes of the case studies. They are not intended to replicate actual proposals previously or currently under consideration.

[Integrating aviation and passenger rail planning](#)

This US Airport Cooperative Research Program (ACRP) report identifies planning process options, funding challenges, and potential actions to improve integration of rail services with airports, particularly in congested corridors.

[Non-destructive structural integrity assessment of a decommissioned rail wagon system](#)

This paper presents a multi-criteria based approach for non-destructive diagnostic structural

integrity assessment of a decommissioned flatbed rail wagon (FBRW) used for road bridge superstructure rehabilitation and replacement applications. The updated and validated FE model of the FBRW is used for structural integrity assessment of a single lane FBRW bridge subjected to the Australian bridge design traffic load.

[Optimization of the freight train service network-design problem with bidirectional service stations](#)

This work provides an optimal solution to the freight train service-design problem faced by a railway network. Train services are analyzed in terms of routing and car and shipment assignment in a network comprising bidirectional service stations. This work uses a case study to examine the implications of the model developed for different service costs at one bidirectional service station. The results show that the methodology used could save 40% of the number of shifted service cars compared with the best-known published model from 2012. In addition, a sensitivity analysis of the results is provided.

Transit

[Exploring the economic viability of bus bridging reserves to improve unplanned passenger rail disruption response](#)

This paper describes a new approach exploring the economic viability of dedicated bus reserves purely for bus bridging purposes. It estimates fleet costs and user benefits of reduced delay by improving response to unplanned rail disruption. and the implications of findings for future research and practice.

[Modal image: candidate drivers of preference differences for BRT and LRT](#)

The physical image of transport systems, as perceived by users and nonusers, has long been put forward as a powerful influence on the formation of preferences. One setting for this is in the choice between bus rapid transit (BRT) and light rail transit (LRT) where there appears to be a strong preference in favour of LRT in developed countries and the reverse in developing countries. Using data collected in six capital cities in Australia in 2013, in which individuals rated two BRT and two LRT designs presented as physical images, we develop a full rank mixed logit model to identify candidate sources of influence on image preferences.



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