



## ACRI Rail Knowledge Bank update

Developed and maintained by the ARRB Group under the [National Interest Services \(NIS\) program](#), the ACRI Rail Knowledge Bank is a managed online resource for the rail industry.

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Developed and maintained by: **ar**r**b**  
GROUP

### New to the ACRI Rail Knowledge Bank

*If you would like your name/organisation added to the ACRI Rail Knowledge Bank alert list, simply email [rail@arrb.com.au](mailto:rail@arrb.com.au) with your request.*

### ACRI / CRC Legacy Research

#### [Better stimulus control at level crossings](#)

Following the Kerang crash coroners inquiry, recommendations were made to investigate improvements to overcome road users 'habitual behaviour' leading missing level crossing active warning controls. This research sought to evaluate new level crossing counter measures to alert motorists to the presence of an approaching train, to allow motorists (especially heavy vehicle drivers) to respond safely to level crossing controls.

### [Evaluation of a level crossing enforcement system: level crossing observational study](#)

This project involved the development and evaluation of new technologies for lower cost level crossing protection, including a practical assessment of a variety of systems.

### [Evaluation of a level crossing enforcement system: user behaviour study](#)

This project involved the development and evaluation of new technologies for lower cost level crossing protection, including a practical assessment of a variety of systems

### [National low-cost level crossing trial program: affordable level crossings: volume 1](#)

Low-cost level crossing warning technology has the potential to provide railway operators with a cost-effective control that can significantly improve safety. This research sought to compare the life-cycle costs and effectiveness of multiple technologies at different trial sites.

### [National low-cost level crossing trial program: affordable level crossings: volume 2](#)

Low-cost level crossing warning technology has the potential to provide railway operators with a cost-effective control that can significantly improve safety. This research sought to compare the life-cycle costs and effectiveness of multiple technologies at different trial sites.

### [Passive solutions to improve the conspicuity of tabletop carriages at railway level crossings at night](#)

There is an existing issue around the poor visibility of table-top train carriages at night at passive level crossings and the likelihood for motorists colliding with these types of carriages. This research investigated if there is a passive engineering solution to highlight the moving or stationary train carriages to reduce the likelihood of incidents of this nature.

### [Slips, trips and falls on trains and at railway stations: phase 1](#)

A study to determine the underlying causes of slip, trip and fall incidents and provide recommendations to mitigate the human factors contributing to these incidents. Stage one of the project involved an identification of the underlying causes and existing interventions in relation to slips, trips and falls.

### [Vysionics VectorLX system evaluation](#)

An independent assessment was carried out of the accuracy of the functionality of the Vysionics VectorLX enforcement system at a busy level crossing site in Victoria.

## **Access Charging**

### [A new rail access charging policy: Hunter Valley coal chain case study](#)

The authors study a rail track access charging policy proposed by the Australian Rail Track Corporation (ARTC), in which a discount on access charges is offered if above-rail operators employ the “efficient train”. The efficient train is a train with a particular length, which results in the efficient use of a train path..

## **Emissions**

### [Field investigation and parametric study of greenhouse gas emissions from railway plain-line renewals](#)

This study was prompted by the industry’s need to systemically estimate greenhouse gas emissions from railway construction and maintenance activities. In this paper, the emphasis is placed on plain-line railway maintenance and renewal projects. The objective

of this study was to reduce the uncertainties and assumptions of previous studies based on ballasted track maintenance and renewal projects.

### [Comparison of passenger rail energy consumption with competing modes](#)

This report provides a comprehensive model that allows the user to compare the energy consumption and greenhouse gas (GHG) emissions of intercity and commuter passenger rail with those of competing travel modes along a designated travel corridor. A technical document and user guide for MMPASSIM and the spreadsheet tool for using and customizing the model are provided as a CD (CRP-CD-176) attached to this report. The technical document and user guide also are available online as NCRRP Web Only Document 1.

### **Human Factors**

#### [Human error risk management methodology for rail crack incidents](#)

The paper presents an innovative approach to modelling the causal relationships of human errors in rail crack incidents (RCI) from a managerial perspective.

### **Intermodal**

#### [Why short-haul intermodal rail services succeed](#)

The shipping container has revolutionised freight transport over the last half-century but its success is bringing challenges, not least in landside container movements. Port-induced road traffic congestion impacts on port arteries and communities and undermines port efficiency. Policymakers and planners seek to shift activities from roads to rail. This is a challenge, however, because most of the containers move over short distances, where trains are relatively uncompetitive. Despite that, there are instances where port-hinterland rail services exist. This report analyses the underlying necessary conditions that need to prevail for those rail services to be sustainable.

### **Level Crossings**

#### [Pedestrian safety at rail grade crossings: focus areas for research and intervention](#)

This paper reports on findings from the literature and discussions with professionals in the public and private sectors involved in safety at rail grade crossings. Major areas found in need for improvement include (a) advancing consistent standards for warning devices and treatments; (b) advancing consistent approaches for managing non-motorist risk; and (c) continuing commitment to education, engineering, enforcement, and evaluation efforts by enabling stakeholders to provide adequate resources. The paper highlights the multitude of factors related to pedestrian safety in this context, and provides an informed discussion for researchers and practitioners involved in advancing safety initiatives.

#### [The benefits of level crossing removals: lessons from Melbourne's historical experience](#)

The study analyses the four main types of road-rail grade separations (elevated rail, trenched rail, road overpasses and underpasses) and assesses their effects using specific case studies (Glenferrie, Canterbury, Balaclava, Malvern, Mitcham, Springvale, Oakleigh, Huntingdale, Essendon, Middle Footscray and Anderson Rd., Sunshine) in Melbourne, Australia.

## **Light Rail**

### **[Review of a proposed light rail service in Hobart: final advisory report](#)**

A range of transport and land use planning measures have been identified as potential solutions to improve passenger transport outcomes in Greater Hobart. Over recent years, the focus of public discussion has been a proposed light rail service through Hobart's northern suburbs, utilising the existing, unused rail corridor from Macquarie Point to Brighton.

## **Safety**

### **[International benchmarking of rail safety indicators](#)**

The aim of this research topic was to identify a suite of implementable recommendations for the improvement of data collection and for the identification of lead and lag indicators for use in the New Zealand rail environment, based on comparison with appropriate operations in the international rail industry. A draft implementation plan for use by the rail industry is included in this report.

## **Tunnels**

### **[Trend analysis of long tunnels worldwide](#)**

The primary objective of this project is to determine the state of the art for construction and operation of long tunnels used for high-speed rail. The research began with a review of the literature on long tunnels around the world, with a focus on characteristics and the research team constructed a detailed database of information on the projects behind the world's long tunnels. Based on the data, this report presents data on 67 tunnels longer than 4.5 miles, including 32 high-speed railway tunnels, located in 28 countries around the world.

## **Wheel Rail Interaction**

### **[Analysis of wheel-roller contact and comparison with the wheel-rail case](#)**

Full-scale roller rigs are recognized as useful test stands to investigate wheel-rail contact/damage issues and for developing new solutions to extend the life and improve the behaviour of railway systems. The replacement of the real track by a pair of rollers on the roller rig causes, however, inherent differences between wheel-rail and wheel-roller contact. In order to ensure efficient utilization of the roller rigs and correct interpretation of the test results with respect to the field wheel-rail scenarios, the differences and the corresponding causes must be understood a priori. The aim of this paper is to derive the differences between these two contact cases from a mathematical point of view and to find the influence factors of the differences with the final aim of better translating the results of tests performed on a roller rig to the field case.

## **Workforce**

### **[A guide to building and retaining workforce capacity for the railroad industry](#)**

This report uses a comprehensive review and analysis of employee characteristics of the railroad industry—including an assessment of past trends and current forecasts and a detailed gap analysis of employee supply and demand—to formulate a series of competency models describing workforce requirements for the passenger and freight railroad industry. The report also presents a strategy for improving employee retention and develops recommendations for enhancing educational programs designed to attract new employees to the industry—employees who meet the demands of these competency requirements.

### ***[NIS informing the LinkedIn community](#)***

A LinkedIn group presence for NIS has recently been established, which will offer to transport professionals on LinkedIn who join, notification of Australian and international transport research projects; transport topic overviews and online resources. Information added to NIS on LinkedIn complements rather than duplicates other offerings such as Making News in Transport, and allows for a more dynamic sharing of information on research projects. [Click here](#) to join.

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### ***[National Interest Services supporting an informed land transport community](#)***

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See the [Rail Knowledge Bank Charter](#) for more information on its objectives and resource coverage.



This email was sent by Jill Aron, ARRB Group, Vermont South, Victoria, Australia

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