



## ACRI Rail Knowledge Bank Update.



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## Data Analysis

*September 2017*

### [Analysis of passenger incident data from five rail transit systems](#)

Hunter-Zaworski, K

The study results reported here are part of a larger research project that developed a manual for practitioners to improve safety at rail transit platform/train and platform/guideway interfaces. As part of that effort, passenger injury incident data was collected from five rail transit systems, and interviews were conducted with safety officers at other rail transit systems in the US and Canada. The data collected showed that stairs and escalators and general platform tripping produced more injury incidents than the platform/train and platform/guideway interfaces. Heavy rail transit with platforms that are higher than 24 inches from top of rail had more injury incidents than light rail transit that typically operates on low level platforms. Other causes of injury incidents included intoxication, attempted suicide, and distraction.

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*October 2017*

### [Massive railway operating data visualization; a tool for RATP operating expert](#)

Dimanche, V

In this article we propose a methodology helping RATP (public transport operator) experts to analyze railway big amount of data. Indeed, a huge number of data can rapidly lead to focus on wrong analysis. We developed a tool prototype based on visual analytics process that can display an overview of a selected railway network area.

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## Design

*August 2017*

## Development of a very light rail vehicle

Winnett, J et al

The collaborative very light rail project involves the development of a novel railcar designed to revolutionise the rail industry: a self-powered, very light rail vehicle. Each of the two bogies contains a complete diesel-electric series-hybrid drive system, while the whole vehicle has undergone significant light-weighting activity to realise a target weight of less than 18 t or 1 t per linear metre. The research covers several aspects of the GB Rail Technical Strategy chapter relating to rolling stock.

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## Fare Evasion

*October 2017*

### Identification of the determinants of fare evasion

Cools, M; Fabbro, Y; Bellemans, T

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## Mobility and Transport

*October 2017*

### Evaluating public transit criticism: systematic analysis of political attacks on high-quality transit, and how transportation professionals can effectively respond

Litman, T

This report systematically evaluates the claims of critics who argue that transit service improvements attract few riders, provide few benefits, are not cost-effective, and are unfair to low-income residents and motorists. Many of the critics' arguments are based on inaccurate, incomplete or biased information. It describes appropriate responses to inaccurate criticisms and may be of interest to transportation professionals, public transit advocates, and anybody interested in determining optimal investments in transit service improvements and TOD.

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*2017*

### Global mobility report 2017: tracking sector performance

Sustainable Mobility for All

The Global Mobility Report is the first-ever study to assess the global performance of the transport sector and the progress made toward four main objectives: universal access, efficiency, safety, and green mobility. The publication covers all modes of transport, including road, air, waterborne, and rail transport.

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*October 2017*

### Melbourne Airport rail link

Aroozoo, M

The paper will look at the history of the proposed airport rail link—the policies, major proposals and feasibility studies—through Hansard debates, government reports, and media comment. Melbourne Airport, including its current regulation, master plans, passenger and employee traffic and revenue, will also be considered. The final section will look briefly at the question, ‘Why build?’ and will discuss the literature concerning policies on airports and transport mode shares, as well as the experiences of airport rail links in Australia.

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*October 2017*

### 30-minute Melbourne: the road (and rail) to the future of the world’s most liveable city

PwC

Generating nearly 80 percent of our national income, and home to 84 percent of Australians, our cities are the heart of Australia’s economy. The future prosperity of Australians depends almost entirely on whether or not our cities thrive. There are a number of factors that create a sense of inclusivity and connection, including physical access to places and people we like, jobs, healthcare and other essential services, and entertainment. With population growth pressures adding to the challenge for Melbourne, how do we ensure we take the right road to the future for the world’s most liveable city?

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*September 2017*

### Prioritising on-road public transport

Lee, A; McCabe, G

This report provides a best practice evaluation of priority measures for the provision of road-based facilities for buses and light rail systems (including streetcars and trams) for application in Australia and New Zealand. It highlights case studies across jurisdictions which show a range of impacts from prioritising on-road public transport.

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## Rail Industry

*October 2017*

## [Australia's rail industry](#)

Parliament of Australia

On 16 March 2016, the following matters were referred to the Australian Senate Rural and Regional Affairs and Transport References Committee inquiry to report on the State of Australia's rail industry and how government procurement, including through the Australian Rail Track Corporation, and other policy levers can improve the value-for-money, competitiveness, stability of work and capability of the rail manufacturing industry.

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*October 2016*

## [Development around stations: exploring international experience and lessons for the UK](#)

Lambert, A

This report looks at ways of maximising the economic, social and environmental benefits to be gained from treating railway stations as primary development hubs. It then offers a number of options for realising those benefit and suggests ways in which their success can be measured. It describes how other countries have addressed this and makes recommendations on ways forward.

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*November 2017*

## [Value of rail: the contribution of rail in Australia](#)

Deloitte Access Economics

This report quantifies the current value of rail to the Australian economy in terms of its contribution to GDP and employment as well as its broader contribution to society through benefits such as reduced emissions, greater safety and reduced congestion. The key challenges facing transport in Australia are explored in more detail and areas of focus for Government and industry are identified in order to ensure that rail continues to generate value for the Australian economy and society.

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## [Rail Structures](#)

*October 2017*

### [Climate change impacts on railway structures: bridge scour](#)

Dikanski, H et al

Weather-related disruption is a pressing issue for transport infrastructure in the UK, which is expected to aggravate due to climate change. Infrastructure managers, such as Network Rail, need to adapt to these changes, tackling the challenges brought about by wide-ranging uncertainties from various sources. This paper explores the relationship between

climate change and bridge scour, identifying barriers to sustainable adaptation.

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*July 2017*

## [Macro synthetic fibres for innovative concrete track slab design and construction](#)

Clarke, T

This paper aims to initiate discussion between track slab designers, owners and operators on the use of macro-synthetic fibres in track slab construction and includes some international case studies. The design and construction practices that were used for each of these will be discussed. It will provide an outline of the methods used for design and analysis of the macro synthetic fibre reinforced track slabs, as well as guidance on construction practices that can be used to optimise the installation and performance of the track slab.

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*September 2017*

## [Pressure distribution under steel and timber crossties in railway tracks](#)

Song, W et al

The pressure distribution under the crossties plays a key role in railroad performance. This study conducts laboratory testing to investigate the pressure distributions under two different types of crossties, steel and timber. For each type, this study employs only a single tie.

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*September 2017*

## [Quantifying the effectiveness of methods used to improve railway track performance over soft subgrades: methodology and case study](#)

Roghani, A; Macciotta, R; Hendry, M

This paper presents a methodology for quantifying the effectiveness of different methods used to improve the railway track performance on soft subgrades. This methodology consists of quantifying the changes in track stiffness from vertical track deflection (VTD) measurements taken before and after the track was upgraded, and the evaluation of the roughness of the track that has developed since the track was upgraded. A case study is presented to explain the steps of this methodology.

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*September 2017*

## [Temperature characteristics analysis of the ballastless track under continuous hot weather](#)

Yang, R et al

This paper analyzes the heat transfer mechanism between a ballastless track and the environment and presents bottom boundary conditions of the track temperature field based on theoretical derivation. A three-dimensional model is established for calculating the track

temperature distribution while considering the geographical location and environmental conditions. A field test verifies this calculation model, and the temperature characteristics of the ballastless track under continuous hot weather are analysed.

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## Safety

2017

### [An investigation into the factors affecting the perception of a train's travelling speed](#)

Clarke, HE

Collisions between cars and trains at railway level crossing junctions continue to occur worldwide, despite efforts to reduce their frequency with educational and practical measures. Many of these collisions occur with car drivers attempting to cross the track in front of an approaching train. The aim of this thesis was to investigate how observer eye movement patterns influence the size-speed illusion, and consequently the underestimation of a large vehicle's speed.

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August 2017

### [Measuring fine-grained metro interchange time via smartphones](#)

Gu, W et al

High variability interchange times often significantly affect the reliability of metro travels. Fine-grained measurements of interchange times during metro transfers can provide valuable insights on the crowdedness of stations, usage of station facilities and efficiency of metro lines. Measuring interchange times in metro systems is challenging since agent-operated systems like automatic fare collection systems only provide coarse-grained trip information and popular localization services like global positioning system (GPS) are often inaccessible underground. In this paper, the authors propose a smartphone-based interchange time measuring method from the passengers' perspective.

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August 2017

### [Improved railway road design for heavy vehicles](#)

Aumann, P et al

The report identifies road design improvements to better cater for the safe passage of heavy vehicles through railway level crossings. Several opportunities for improvements were identified, principally to guidance on applying the sight lines and sight distances for a range of approaches, particularly on curved roads. Other improvements suggested include the addition of a short stacking warning sign and improving delineation by having all road approaches sealed to enable pavement markings, such as RAIL X and edgelines.

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August 2017

## Overcoming obstacles to implementing SMS

Lappalainen, J

This paper discusses obstacles faced in implementing safety management systems (SMS) and uses concrete examples to show how to overcome them across all modes of transport (air, maritime, rail and road) in leading countries, particularly ITF member countries.

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October 2017

## Teenage trespass on the railways: a systems approach

Waterson, PE; Kendrick, VL; Underwood, PJ

Rail trespass and risk-taking behaviours are particularly high among 16–25-year-olds. The aim of the research described in this paper is to understand how the communication of safety information to these groups can be improved.

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## The Rail Knowledge Bank is supported by ACRI and ARRB.

Developed and maintained by the [Australian Road Research Board \(ARRB\)](#) under the [National Interest Services \(NIS\) program](#), the Australasian Centre for Rail Innovation (ACRI) Rail Knowledge Bank is a managed online resource for the rail industry. It gratefully acknowledges the support of rail sector bodies including the RTSA. The Rail Knowledge Bank was originally funded by the CRC for Rail Innovation.

For more information, visit the ACRI website at [acri.net.au](http://acri.net.au) or [click here](#) to visit the Rail Knowledge Bank page directly.

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

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