



ACRI Rail Knowledge Bank Update.



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Capacity Utilisation

June 2017

[Evaluating service risk in railway capacity utilization using expected recovery time](#)

Lai, Y; Chen, K

Previous capacity research has mainly focused on capacity measurement without evaluating the potential risks from an increase in the capacity-utilization level. This research proposes a new concept, namely, risk in capacity utilization, by using expected recovery time to quantify the service risk in capacity utilization

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June 2017

[Hidden content of passenger data in public transport](#)

Nagy, V; Horvath, B

Nowadays, data sets are spreading continually, generated by different devices and systems. In most cases, these data are stored, and the service providers don't use the information they contain, what even more they delete these data to save space. However, these data are processable with the modern devices and methods, and we can use them for obtaining information. This paper presents a possible application of the digital raw materials, taking the public transport passengers boarding and alighting information as a base.

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Design

April 2017

[A comparative study of funnel shape bottlenecks in subway stations](#)

Sun et al

Congestion is expected to form at bottlenecks such as escalator and staircase entrances with high rate of passenger flow, which could decrease walking efficiency and passenger comfort. Currently, no special treatment is adopted in most of the conventional bottlenecks in subway stations. This study conducts a series of pedestrian experiments to investigate the effectiveness of adding a funnel shape buffer zone in front of the bottleneck entrance.

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March 2017

[Pedestrian simulation in transit stations using agent-based analysis](#)

Tang, M; Hu, Y

The research discusses experiential outcome in the application of crowd simulation technology to analyze the pedestrian circulation in public spaces to facilitate design and planning decisions. The paper describes how to connect spatial design with agent-based simulation (ABS) for various design and planning scenarios.

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December 2012

[Train design features affecting boarding and alighting of passengers](#)

Thoreau, R et al

Accurately predicting train dwell time is critical to running an effective and efficient service. With high-density passenger services, large numbers of passengers must be able to board and alight the train quickly – and within scheduled dwell times. Using a specially constructed train mock-up in a pedestrian movement laboratory, the experiments outlined in this paper examine the impact of train carriage design factors such as door width, seat type, platform edge doors and horizontal gap on the time taken by passengers to board and alight.

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Environment / Efficiency

May 2017

[A dynamic programming approach for optimizing train speed profiles with speed restrictions and passage points](#)

Haahr, J; Pisinger, D; Sabbaghian, M

This paper considers a novel solution method for generating improved train speed profiles with reduced energy consumption. The solution method makes use of a time-space graph formulation which can be solved through Dynamic Programming. Instead of using uniform discretization of time and space as seen previously in the literature, the authors rely on an event-based decomposition that drastically reduces the search space. This approach is very flexible, making it easy to handle, e.g., speed limits, changes in altitude, and passage points that need to be crossed within a given time window.

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March 2017

[A method to measure the eco-efficiency of diesel locomotive](#)

Carvalhaes, B et al

Brazilian railroads transport over 490 million tons a year using diesel-electric locomotives. These locomotives emit several pollutants into the atmosphere and because of that, the railroads seek to reduce emissions and achieve global emission standards. Thus, it is important to analyze the environmental impact of the use of diesel and alternative fuels to reach environmental standards.

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June 2017

[An integrated framework for assessing service efficiency and stability of rail transit systems](#)

Lai, Y; Ip, C

A well-designed service plan efficiently utilizes its infrastructure and ensures an acceptable level of service stability with consideration of potential incidents that disturb or disrupt the rail transit services. To perform service evaluation, an integrated process combining capacity, resource usage, and system reliability is required to quantify service efficiency and stability in a consistent way.

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April 2017

[5 years of Dutch eco-driving: managing behavioural change](#)

Luijt, R et al

In the past years a new management approach has been developed to stimulate and monitor energy savings at the largest Dutch Train Operating Company. This eco-driving

approach has led to yearly energy savings of up to 5% from 2010 to 2015.

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March 2017

[Is rail cleaner and greener than bus?](#)

Mulley, C; Hensher, D; Cosgrove, D

The popular consensus is that urban passenger rail is more environmentally friendly than urban passenger bus. This paper takes a close look at the greenhouse emissions that are associated with urban rail and bus in Australia. Estimated intensities, when presented in the context of effective service delivery (primarily in terms of emissions per passenger kilometre), raise questions about the distortions that are present in the widespread promotion in Australia (at least) of rail as a more environmentally friendly and hence a sustainable mode of urban passenger transport than bus.

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May 2017

[Joint optimal train regulation and passenger flow control strategy for high-frequency metro lines](#)

Li, S et al

To improve the headway regularity and commercial speed of high-frequency metro lines with overloaded passenger flow, this paper systematically investigates a joint optimal dynamic train regulation and passenger flow control design for metro lines.

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Infrastructure

May 2017

[Off the rails: the cost performance of infrastructure rail projects](#)

Love, P et al

Governments in Australia place great emphasis on the development and expansion of their rail networks to improve productivity and service the increasing needs and demands from businesses and commuters. A case study approach is used to analyze the cost performance of 16 rail projects constructed by a contractor between 2011 and 2014, which ranged from AU\$3.4 to AU\$353 million.

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Level Crossing

July 2017

Improved pedestrian sight-distance needs at railroad-highway grade crossings

Easa, S; Qu, X; Dabbour, E

This paper presents an improved model for pedestrian crossing time that is used to establish preliminary guidelines for lateral clearance needs on railroad-highway grade crossings.

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Rail Track

May 2017

Field test performance of noncontact ultrasonic rail inspection system

Mariani, S et al

This paper presents the latest results from a noncontact ultrasonic rail inspection system developed at the University of California, San Diego (UCSD). Two field tests were conducted at test speeds from 1.6 to 24 km/h (1 to 15 mi/h). The results of these tests, evaluated in terms of probability of detection versus probability of false alarms (receiver operating characteristic curves) indicate a good detection performance at the speeds of 1.6 and 8 km/h, with a much poorer performance at the speeds of 16 and 24 km/h. Possible reasons for the performance degradation at the higher speeds are discussed, and future work aimed at mitigating these issues is proposed.

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July 2017

Threshold radius of a ballasted CWR curved track: curve classification

Hasan, N

Different codes and railways specify different maximum curvatures for their track systems. The curve-negotiating capability of the vehicle dictates the absolute minimum radius used on a track system; other factors may also be considered to decide the minimum radius. In this paper, a minimum radius labeled as the threshold radius is determined when a ballasted, continuously welded curved track would not move under the action of thermal load in an unladen track.

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Stated Preference

June 2017

Public perception of and attitude to driverless train: a case study of Sydney, Australia

Fraszczyk, A; Mulley, C

There are 32 cities around the world with automated metro systems in operation. The majority of these are located in Europe (13) and Asia (14) but none so far in Australia. However, the picture is changing in 2019 when the first stage of the 'Sydney Metro' starts its operation on the North West link in Sydney, New South Wales, Australia. The automated train is planned to be used safely without human interaction, thus reducing significantly the labour input in the provision of service. This paper aims to investigate public opinion of the new Sydney Metro service fully automated system by undertaking a research on people's perceptions of a driverless train as well as their attitudes to the new transport system and public transport more generally.

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December 2016

Valuing the cost to rail passengers of travelling underground

Douglas, N

Mature city development has forced metropolitan rail line construction underground. In Sydney, Melbourne, Brisbane and Auckland major new underground rail links are at the planning or construction stage. Despite this trend, a review of the literature was unable to find any studies that have estimated the preference for surface versus underground travel amongst rail passengers. This paper reports the results of a 2014 survey of 347 Sydney rail users using services with some underground track.

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

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Rail Knowledge Bank



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