ACRI Rail Knowledge Bank Update.

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Design

June 2017

Width design of urban rail transit station walkway: a novel simulation-based optimization approach
Khattak, A et al

The optimal design of the walkway at an urban rail transit station is a vital issue. The Transit Capacity and Quality of Service Manual (TCQSM) TCRP-100 report for the design of urban rail transit station walkway and the existing design models neglect the important factors such as randomness in the passenger arrival rate, randomness and state-dependent service time of the walkway and blocking phenomenon when the passenger flow demand exceeds the walkway capacity. There obviously exists a need to develop a design approach that overcomes these shortcomings. For this purpose, this paper details a simulation-based optimization approach that provides width design through automatic reconfiguration of walkway width during the simulation–optimization process based on phase-type (PH) distribution.

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Environment

July 2017

The combined effects of aircraft and road traffic noise and aircraft and railway noise on noise annoyance: an analysis in the context of the joint research initiative NORAH
Wothge, J et al

The Noise Related Annoyance Cognition and Health (NORAH) research initiative is one of the most extensive studies on the physiological and psychological long-term effects of transportation noise in Europe. It includes research on the quality of life and annoyance as well as cardiovascular effects, sleep disturbance, breast cancer, blood pressure, depression and the cognitive development of children.

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July 2017

Comparison of annoyance from railway noise and railway vibration

Ögren, M et al

The aim of this study is to compare vibration exposure to noise exposure from railway traffic in terms of equal annoyance, i.e., to determine when a certain noise level is equally annoying as a corresponding vibration velocity. Based on questionnaire data from the Train Vibration and Noise Effects (TVANE) research project from residential areas exposed to railway noise and vibration, the dose response relationship for annoyance was estimated.

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Freight Services

August 2017

Freight rates in Australia

Bureau of Infrastructure, Transport and Regional Economics (BITRE)

The information sheet presents an estimate of interstate freight rates for road, rail, sea and air modes back to 1965. Models of the first three modes are also presented, allowing an understanding of the determinants of the level and movement of freight rates in Australia. The estimates and models presented show that following rapid declines in real freight rates during 1975 to 1985 for road and 1985 to 1995 for rail and sea, the trend has since been basically sideways—higher or lower due to trends in technology, fuel prices and the economy.

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Knowledge Management

July 2017

PDF Drive

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Network Operations

July 2017

Non-discriminatory train dispatching in a rail transport market with multiple competing and collaborative train operating companies

Luan, X; Corman, F; Meng, L

Train dispatching is vital for the punctuality of train services, which is critical for a train operating company (TOC) to maintain its competitiveness. Due to the introduction of competition in the railway transport market, the issue of discrimination is attracting more and more attention. This paper focuses on delivering non-discriminatory train dispatching solutions while multiple TOCs are

competing in a rail transport market, and investigating impacting factors of the inequity of train dispatching solutions.

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July 2017

Robust routing and timetabling in complex railway stations

Burggraeve, S; Vansteenwegen, P

In nearly saturated station areas the limited capacity is one of the main reasons of delay propagation. Spreading the trains well in time and space in these areas has a big impact on the passenger robustness, i.e. the total travel time in practice of all passengers in the railway network in case of frequently occurring small delays. The authors focus on improving the performance in the bottleneck of the network in order to improve the performance of the whole railway network. This paper proposes a method that builds from scratch a routing plan and a cyclic timetable that optimizes the infrastructure occupation and the passenger robustness.

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July 2017

Rolling stock rescheduling in passenger railway transportation using dead-heading trips and adjusted passenger demand

Wagenaar, J; Kroon, L; Fragkos, I

In this paper the authors introduce dead-heading trips and adjusted passenger demand in the Rolling Stock Rescheduling Problem (RSRP). Unfortunately, disruptions disturb passenger railway transportation on a daily basis. Such a disruption causes infeasibilities in the timetable, rolling stock circulation, and crew schedule. The authors propose a Mixed-Integer Linear Programming model to tackle the RSRP.

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July 2017

A safety management and signaling system integration method for communication-based train control system

Yan, F et al

The safety and the correctness of signaling system not only relate to the safety and efficiency of the rail transit operation, but also link with the life safety of passengers. In order to guarantee the safety of a signaling system for metro, the safety certificate for the trial operation with carrying passengers must be obtained. In this paper, a suitable safety management and signaling system integration model are explored according to the CENELEC standards and applied in China.

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Level Crossing

July 2017

Active 'Expect Trains' sign trial

Larue, G

The safety of level crossings is a high priority for Australia and New Zealand, with a particular focus on safety systems at passive level crossings – these are not controlled by flashing lights, boom gates or warning bells. This ACRI study has been designed to complement the evaluation conducted by KiwiRail at one of the sites where the active signage has been installed in New Zealand. The active 'Expect Trains' signage provides a range of benefits at level crossings for drivers unaware of the presence of a passive level crossing, such as attraction of drivers' attention to road signs, gaze behaviour and speed choices. This research report has been included to inform rail professionals of research being undertaken in this space.

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August 2017

International level crossing safety study tour
TrackSAFE Foundation

TrackSAFE led an International Level Crossing Safety Study Tour to the USA and UK, 20 – 30 March 2017, to gain an understanding of how these countries manage risk and to discover the new and innovative level crossing safety technologies being utilised. The delegation comprised of 13 delegates from rail organisations including passenger and freight operators, rail infrastructure managers, the Office of the National Rail Safety Regulator, government and research bodies. This report is based on the findings and key observations of Study Tour participants, benchmarking Australia and New Zealand against the USA and UK; gaining an understanding of the range of technologies and approaches being used overseas; and providing the opportunity to learn and share experiences with rail safety experts regarding how level crossing risk is managed. Knowledge was shared on regulatory frameworks, education, enforcement, stakeholder management, database inventory, risk management and engineering.

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Public Transport

January 2016

Public transportation, volume 6: marketing, fare policy, and transformative data trends

This issue contains sixteen papers on the marketing, fare policy and transformative data trend aspects of public transportation. Specific topics addressed in this issue include, among others, the following: off-peak pricing strategies; fare evasion; nonadditive fare pricing; subway crowding; social and distributional effects of fares and subsidy policies; inference of access distance; express train choice; smart card data; and visualizing transit data. Additional topics addressed in this issue are: big data for bus fleets; rail transit ridership and route-level origin-destination flows.

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January 2016

Reducing subway crowding: analysis of an off-peak discount experiment in Hong Kong

Halvorsen, A et al

Increases in ridership are outpacing capacity expansions in several transit systems. By shifting their focus to demand management, agencies can instead influence how customers use the system and get more out of their present capacity. This paper uses Hong Kong's Mass Transit Railway (MTR) system as a case study to explore the effects of crowding reduction strategies and how to use fare data to support these measures

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Rail Track

August 2017

Geometrical degradation analysis of railway turnouts using power spectral density

Minbashi, N et al

This paper examines the application of power spectral density (PSD) in turnout geometrical degradation analysis. Power spectral density in the form of a continuous curve can show track irregularities through wavelength and amplitude. The longitudinal level parameter measurements of four turnouts from Swedish railways are selected. ProVal software is used for PSD implementation. The PSD curves of the actual measurements are compared to PSD standards programmed in MATLAB. The knowledge obtained by PSD is helpful when planning corrective maintenance activities to rectify geometrical faults in turnouts of a line, reducing the time and money spent on maintenance.

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