Railroads 2018

Transportation Research Record: Journal of the Transportation Research Board Volume 2672, Issue 10

ISBN: 978-1-5108-8179-2

Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Published by Sage Publications USA

Copyright© (2018) by Transportation Research Board of the National Academies All rights reserved.

ISBN (Print) 978-1-5108-8179-2 ISBN 2018 Printed Set (All Issues) 978-1-5108-7735-1

Printed by Curran Associates, Inc. (2019)

For permission requests, please contact sagepub.com/journals-permissions

Additional copies of this publication are available from:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 USA Phone: 845-758-0400 Fax: 845-758-2633 Email: curran@proceedings.com Web: www.proceedings.com



Contents

Railroads

Articles

| Evaluating the Impact of Highway-Railway Grade Crossings on Travel Time Reliability on a Highway Network Level | I |
|--|-----|
| Zifeng Wu, Laurence R. Rilett, and Yifeng Chen | |
| Rails-Next-to-Trails: A Methodology for Selecting Appropriate Safety Treatments at Complex Multimodal Intersections Anna Bovbjerg Alligood, Manali Sheth, Anne Goodchild, Edward McCormack, and Polina Butrina | 12 |
| Modeling the Probability of Hazardous Materials Release in Crashes at Highway–Rail Grade Crossings Amirfarrokh Iranitalab, Yashu Kang, and Aemal Khattak | 28 |
| Injury Severity of Truck Drivers in Crashes at Highway-Rail Grade Crossings in the United States Waleed A. Khan and Aemal J. Khattak | 38 |
| Direct and Indirect Effects of Nebraska Motor Vehicle Drivers' Characteristics on Inattentive Driving at Highway-Rail Grade Crossings Shanshan Zhao and Aemal J. Khattak | 48 |
| Evaluation of Railway Ballast Permeability Using Machine Vision–Based Degradation Analysis Haohang Huang, Maziar Moaveni, Scott Schmidt, Erol Tutumluer, and John M. Hart | 62 |
| Support Condition and Traffic Loading Patterns Influencing Laboratory Determination of Under Ballast Mat Bedding Modulus and Insertion Loss Arthur de O. Lima, Marcus S. Dersch, Erol Tutumluer, J. Riley Edwards, and Yu Qian | 74 |
| Investigation of Relationship between Train Speed and Bolted Rail Joint Fatigue Life using Finite Element Analysis Hao Yin, Yu Qian, J. Riley Edwards, and Kaijun Zhu | 85 |
| Effects of Pier Deformation on Train Operations within High-Speed Railway Ballastless Track–Bridge Systems De Zhang, Junhua Xiao, and Xiao Zhang | 96 |
| Evaluation of Ballast Behavior under Different Tie Support Conditions using Discrete Element Modeling Wenting Hou, Bin Feng, Wei Li, and Erol Tutumluer | 106 |
| Laboratory Characterization of Structural Capacity of North American Heavy Haul Concrete Crossties Josué C. Bastos, Alejandro Álvarez-Reyes, Marcus S. Dersch, J. Riley Edwards, and Christopher P. L. Barkan | 116 |
| Full-Scale Model Testing on Ballasted High-Speed Railway: Dynamic Responses and Accumulated Settlements Wei Li, Xuecheng Bian, Xiang Duan, and Erol Tutumluer | 125 |
| Quantification of Loading Environment and Flexural Demand of Prestressed Concrete Crossties under Shared Corridor Operating Conditions Ricardo J. Quirós-Orozco, J. Riley Edwards, Yu Qian, and Marcus S. Dersch | 136 |

| Application of Granular Material Pressure Cells to Measure Railroad Track Tie/Ballast Interfacial Pressures Jerry G. Rose, David B. Clarke, Qinglie Liu, and Travis J. Watts | 146 |
|---|-----|
| Quantitative Analysis of the Derailment Characteristics of Loaded and Empty Unit Trains Weixi Li, Geordie S. Roscoe, Zhipeng Zhang, M. Rapik Saat, and Christopher P. L. Barkan | 156 |
| The Life and Death of North American Rail Freight Electrification John G. Allen and Gregory L. Newmark | 166 |
| Accident-Cause-Specific Risk Analysis of Rail Transport of Hazardous Materials Xiang Liu, Tejashree Turla, and Zhiþeng Zhang | 176 |
| Incorporating Economic Assessment into Capacity Allocation and Infrastructure Charging Policies for Vertically-Separated Railways Aleksandr Prodan and Paulo F. Teixeira | 188 |
| Simulation-Based Method of Capacity Utilization Evaluation to Account for Uncertainty in Recovery Time Yung-Cheng (Rex) Lai, Kuan-Ting Chen, Tzu-Hao Yan, and Ming-Hua Li | 202 |
| Stochastic Model of Train Running Time and Arrival Delay: A Case Study of Wuhan–Guangzhou High-Speed Rail Javad Lessan, Liping Fu, Chao Wen, Ping Huang, and Chaozhe Jiang | 215 |
| A Bi-Level Passenger Preference-Oriented Line Planning Model for High-Speed Railway Operations Yuxiang Yang, Jie Li, Chao Wen, Ping Huang, Qiyuan Peng, and Javad Lessan | 224 |
| Improving Intercity Passenger Rail Planning using Evidence from Passenger Survey Data Benjamin R. Sperry and Tyler Collins | 236 |
| Economic Impact Analysis on Regional Industries by High-Speed Rail Investments: Application of an Input-Output Model Changju Lee, Jiaqi Ma, and Kwan Kyo Oh | 247 |
| Impact of Train Drivers' Cognitive Responses on Rail Accidents Bahareh Hani Tabai, Morteza Bagheri, Vahid Sadeghi-Firoozabadi, Vahideh Shahidi, and Hadi Mirasadi | 260 |
| Video Analytics for Railroad Safety Research: An Artificial Intelligence Approach Asim Zaman, Xiang Liu, and Zhipeng Zhang | 269 |
| Feedforward Tactical Optimization for Energy-Efficient Operation of Freight Trains: The Swiss Case Valerio De Martinis, Ambra Toletti, Francesco Corman, Ulrich A. Weidmann, and Andrew Nash | 278 |