

Transportation Research Record: Journal of the Transportation Research Board

Volume 2674, Issue 10

October 2020

Part 1 of 2

ISBN: 978-1-7138-1955-4

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© (2020) by Transportation Research Board of the National Academies
All rights reserved.

ISBN (Print) 978-1-7138-1955-4

Printed with permission by Curran Associates, Inc. (2020)

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

Research Articles

Case Study of Trend Mining in <i>Transportation Research Record</i> Articles <i>Subasish Das, Anandi Dutta, and Marcus A. Brewer</i>	1
Cross-Sectional Study of Vehicle Speeds on Rural Four-Lane Highway Curves <i>Michael P. Pratt, Srinivas R. Geedipally, and Minh Le</i>	15
Deep Learning Framework for Freeway Speed Prediction in Adverse Weather <i>Abdullah Shabarek, Steven Chien, and Soubhi Hadri</i>	28
Deep Reinforcement Learning-Based Vehicle Driving Strategy to Reduce Crash Risks in Traffic Oscillations <i>Meng Li, Zhibin Li, Chengcheng Xu, and Tong Liu</i>	42
Dial-a-Ride Problem with Users' Accept/Reject Decisions Based on Service Utilities <i>Xiaotong Dong, David Rey, and S. Travis Waller</i>	55
A Hybrid Machine Learning Approach for Freeway Traffic Speed Estimation <i>Zhao Zhang, Yun Yuan, and Xianfeng (Terry) Yang</i>	68
Predictive Framework for Modeling Changes in Asphalt Mixture Moduli with Oxidative Aging <i>Nooralhuda F. Saleh, Douglas Mocelin, Farhad Yousefi Rad, Cassie Castorena, B. Shane Underwood, and Y. Richard Kim</i>	79
Proof of Concept for a Grounded Theory Approach to Understanding Interactions Occurring on Bicycle Facilities <i>Cat Silva, Rolf Moeckel, and Kelly Clifton</i>	94
Proposed Framework for Identifying and Predicting Operator Errors When using Advanced Vehicle Technologies <i>Anuj K. Pradhan, Ganesh Pai, Jaydeep Radadiya, Michael A. Knodler Jr., Cole Fitzpatrick, and William J. Horrey</i>	105
Two-Stage Model for Optimized Mitigation and Recovery of Bridge Network with Final Goal of Resilience <i>Ning Zhang and Alice Alipour</i>	114
Web-Based Data Visualization Platform for MATSim <i>Billy Charlton and Janek Laudan</i>	124
Accelerated Pavement Testing to Evaluate the Reinforcement Effect of Geogrids in Flexible Pavements <i>Bingye Han, Pawel Polaczyk, Hongren Gong, Rong Ma, Yuetan Ma, Fulu Wei, and Baoshan Huang</i>	134
Analysis of Single-Vehicle Roadway Departure Crashes on Rural Curved Segments Accounting for Unobserved Heterogeneity <i>Mouyid Islam and Anurag Pande</i>	146
Autonomous Vehicle Application for Improving Traffic Sign Learning near Ramps <i>Zhenhua Zhang, Leon Stenneth, and Xiyuan Liu</i>	158
Innovative Nonparametric Method for Data Outlier Filtering <i>Zifeng Wu, Zhouxian Wu, and Laurence R. Rilett</i>	167

Analysis of Temperature Variation and Thermally-Induced Reflective Cracking Potential in Composite Pavements <i>Pengyu Xie and Hao Wang</i>	177
Analysis of Travel-Time Use in Crowded Trains using Discrete-Continuous Choices of Commuters in Tokyo, Japan <i>Varun Varghese, Makoto Chikaraishi, and Hironori Kato</i>	189
Applications and Estimate Comparisons of Bezgin–Kolukirik Equations for Dynamic Impact Forces Because of Wheel Flats with Numerical Analysis Estimates and Instrumented Track Measurements <i>Niyazi Özgür Bezgin and Cengiz Kolukirik</i>	199
Applying Bayesian Optimization for Calibration of Transportation Simulation Models <i>Di Sha, Kaan Ozbay, and Yue Ding</i>	215
Arc Detection and Recognition in the Pantograph-Catenary System Based on Multi-Information Fusion <i>Shize Huang, Wei Chen, Bo Sun, Ting Tao, and Lingyu Yang</i>	229
As-Encountered Prediction of Tunnel Boring Machine Performance Parameters using Recurrent Neural Networks <i>Kabir Nagrecha, Luis Fisher, Michael Mooney, Tonatiuh Rodriguez-Niki, Mehran Mazari, and Mohammad Pourhomayoun</i>	241
Assessing the Existing Bursa Light Rail Transportation System <i>Mehmet Rizelioğlu and Turan Arslan</i>	250
Assessment of Concrete Curing Duration using Bulk Electrical Conductivity and Porosity <i>Kanchani Basnayake, Abul Fazal Mazumder, Upul Attanayake, and Neal S. Berke</i>	261
Assessment of Factors Affecting Measurement Accuracy for High-Quality Weigh-in-Motion Sites in the Long-Term Pavement Performance Database <i>Syed Waqar Haider, Muhamad Munum Masud, Olga Selezneva, and Dean J. Wolf</i>	269
Automated Segmentation and Morphological Analyses of Stockpile Aggregate Images using Deep Convolutional Neural Networks <i>Haohang Huang, Jiayi Luo, Erol Tutumluer, John M. Hart, and Andrew J. Stolba</i>	285
Bending and Impact Testing of Wood Guardrail Posts Evaluated using Stress Wave Timing Inspection <i>Qiyang Luo, Evan Olszko, Adam R. Phillips, and Donald A. Bender</i>	299
Capacity Modeling of Permitted Left-Turn Signalized Intersections with Probabilistic Priority <i>Daobin Wang, Guangchuan Yang, Zong Tian, Wei Liu, and Dali Wei</i>	310
Characterization of Aggregate Angularity in the Frequency Domain <i>Hongbin Xu, Jorge A. Prozzi, Moo Yeon Kim, and Joaquin Bernardo Hernandez</i>	324
Children, Income, and the Impact of Home Delivery on Household Shopping Trips <i>C. Anna Spurlock, Annika Todd-Blick, Gabrielle Wong-Parodi, and Victor Walker</i>	335
Commuters' Assessment of Public Transport as a “Reasonable” Option in Montreal, QC <i>James DeWeese and Ahmed El-Geneidy</i>	351
Cooperative Highway Work Zone Merge Control Based on Reinforcement Learning in a Connected and Automated Environment <i>Tianzhu Ren, Yuanchang Xie, and Liming Jiang</i>	363
Deriving Daily Activity Schedules from Dynamic, Purpose-Dependent Origin–Destination Matrices <i>Haris Ballis and Loukas Dimitriou</i>	375

Determining Optimum Transit Signal Priority Implementation Locations on a Network <i>Murat Bayrak and S. Ilgin Guler</i>	387
Developing Highway Capacity Manual Capacity Adjustment Factors for Connected and Automated Traffic on Freeway Segments <i>Adekunle Adebisi, Yan Liu, Bastian Schroeder, Jiaqi Ma, Burak Cesme, Anxi Jia, and Abby Morgan</i>	401
Development of Operating Mode Distribution Models for Light-Duty Vehicles on Unrestricted Access Roadways <i>Jia Li, Hanhui He, and Bo Peng</i>	416
Eco Look-Ahead Control of Battery Electric Vehicles and Roadway Grade Effects <i>Kyoungho Ahn, Hesham A. Rakha, and Sangjun Park</i>	429
Effect of Glass Bead Refractive Index on Pavement Marking Retroreflectivity Considering Passenger Vehicle and Airplane Geometries <i>Adam M. Pike and Songjukta Datta</i>	438
Statistics and Artificial Intelligence-Based Pavement Performance and Remaining Service Life Prediction Models for Flexible and Composite Pavement Systems <i>Orhan Kaya, Halil Ceylan, Sunghwan Kim, Danny Waid, and Brian P. Moore</i>	448
Investigation of Thermal Sensation in a Railway Vehicle during Cooling Period <i>Gökhan Sevilgen, Gürcan Sayaral, Muhsin Kiliç, and Halil Bayram</i>	461
Typology of Bikeshare Users Combining Bikeshare and Transit <i>Léandre Tarpin-Pitre and Catherine Morency</i>	475
Modified State Surface Approach to Study Unsaturated Soil Hysteresis Behavior <i>Beshoy Riad and Xiong Zhang</i>	484
Traffic Signal Control Optimization in a Connected Vehicle Environment Considering Pedestrians <i>Xiao (Joyce) Liang, S. Ilgin Guler, and Vikash V. Gayah</i>	499
Estimating Truck Traffic Generated from Well Developments on Low-Volume Roads <i>Ioannis Tsapakis</i>	512
Evaluating Traffic Efficiency and Safety by Varying Truck Platoon Characteristics in a Critical Traffic Situation <i>Timo Faber, Salil Sharma, Maaïke Snelder, Gerdien Klunder, Lóránt Tavasszy, and Hans van Lint</i>	525
Safety Performance of One-Way Arterials <i>Srinivas R. Geedipally, Dominique Lord, Michael P. Pratt, Kay Fitzpatrick, and Eun Sug Park</i>	548
Traffic Flow Breakdown Prediction using Machine Learning Approaches <i>Monika Filipovska and Hani S. Mahmassani</i>	560
Exploratory Analysis of the Relationships between Congestion, Travel Time Reliability, and Freight-Related Performance Management Measures and Their Associativity with the Roadway Attributes <i>Chowdhury Siddiqui and Kwanpyo Ko</i>	571
GIS-Based Multivariate Spatial Clustering for Traffic Pattern Recognition using Continuous Counting Data <i>Md Mehedi Hasan and Jun-Seok Oh</i>	583
Identifying Roadway Physical Characteristics That Contribute to Emissions Differences between Hybrid and Conventional Vehicles <i>James L. Sullivan and Karen Sentoff</i>	599
Mechanistic Analyses and Modeling of Pavement Sections Utilizing Sustainable Aggregate Quarry By-Product Applications <i>Issam I. A. Qamhia, Erol Tutumluer, Hasan Ozer, and Pranshoo Solanki</i>	614

Modeling the Rounding of Departure Times in Travel Surveys: Comparing the Effect of Trip Purposes and Travel Modes <i>Yoshihiro Sato and Takuya Maruyama</i>	628
First-Mile-Last-Mile Collector-Distributor System using Shared Autonomous Mobility <i>Krishna Murthy Gurumurthy, Kara M. Kockelman, and Natalia Zuniga-Garcia</i>	638
Evaluation of Sequential Dynamic Chevron Warning Systems on Rural Two-Lane Curves <i>Shauna Hallmark, Amrita Goswamy, Theresa Litteral, Neal Hawkins, Omar Smadi, and Skylar Knickerbocker</i>	648
Full-Scale Evaluation of Relatively Thin Airfield Pavements <i>W. Jeremy Robinson, Jeb S. Tingle, and Carlos R. Gonzalez</i>	658
Platform-Based Collaborative Routing using Dynamic Prices as Incentives <i>Bilge Atasoy, Frederik Schulte, and Alex Steenkamp</i>	670
Preventing Animal-Vehicle Crashes using a Smart Detection Technology and Warning System <i>Cristian Druta and Andrew S. Alden</i>	680
Impact of Stochasticity on Traffic Flow Dynamics in Macroscopic Continuum Models <i>Shi-Teng Zheng, Rui Jiang, Bin Jia, Junfang Tian, and Ziyao Gao</i>	690
Use of Coarse Recycled Concrete Aggregate in Ternary Blended Portland Cement Concrete <i>Seth Wagner, Gabrielle Wickizer, Douglas Cleary, Gilson R. Lomboy, Danielle Kennedy, Benjamin Watts, and Peter Bly</i>	705
Investigation of the Contract Time Determination Systems Used for Highway Projects in the U.S.A. <i>Mohamed Abdel-Raheem and Jennifer Reyes</i>	715
Optimal Energy Speed Profile of Medium-Speed Maglev Trains Integrating the Power Supply System and Train Control System <i>Qingying Lai, Jun Liu, Ali Haghani, Lingyun Meng, and Yihui Wang</i>	729
Record Linkage of Crashes with Injuries and Medical Cost in Puerto Rico <i>Josie D. Bianchi Santiago, Héctor Colón Jordán, and Didier Valdés</i>	739
Truck Parking Usage Patterns by Facility Amenity Availability <i>Sharif Mahmud, Taslima Akter, and Sarah Hernandez</i>	749
Incorporating Equity into Pedestrian Master Plans <i>Amber Berg and Gregory L. Newmark</i>	764
Structural Characterization of Fractured Portland Cement Concrete Pavements in Pennsylvania from Falling Weight Deflectometer Data <i>Luis Ramirez and Dennis Morian</i>	781
Using Close-Range Photogrammetry to Measure Pavement Texture Characteristics and Predict Pavement Friction <i>Mohammad Al-Assi, Emad Kassem, and Richard Nielsen</i>	794
Improving Durability of Asphalt Pavements in Louisiana through Increased In-Place Field Density <i>Moses Akentuna, Louay N. Mohammad, Minkyum Kim, Samuel B. Cooper III, and Samuel B. Cooper Jr.</i>	806
Impacts of Connected and Autonomous Vehicles on Traffic Flow with Heterogeneous Drivers Spatially Distributed over Large-Scale Networks <i>Fatemeh Fakhrmoosavi, Ramin Saedi, Ali Zockaie, and Alireza Talebpour</i>	817

Understanding the Effectiveness of Bus Rapid Transit Systems in Small and Medium-Sized Cities in North America <i>Michaela Sidloski and Ehab Diab</i>	831
Evaluation of Alternative Methods for Dynamic I-95 Express Lane Pricing <i>Djurdjija Mitrovic, Aleksandar Stevanovic, and Drazenko Glavic</i>	846
Existing Problems of Transit Signal Priority on Streetcar Routes <i>Ivan Kwong, Mehdi Nourinejad, and Amer Shalaby</i>	861
Exploring Support for and Solutions to Family CABs (Chauffeur-Associated Burdens) <i>Daniel P. Piatkowski</i>	874
From Delay to Disruption: Impact of Service Degradation on Public Transport Networks <i>Alessio Daniele Marra and Francesco Corman</i>	886
Health Impact Assessment of Connected and Autonomous Vehicles in San Francisco, Bay Area <i>Elham Pourrahmani, Miguel Jaller, Neil Maizlish, and Caroline Rodier</i>	898
Institute of Transportation Engineers Guidelines versus Actual Trip and Parking Generation for a Transit-Oriented Development in an Auto-Oriented Region <i>Shima Hamidi, Roya Etmnani-Ghasrodashti, Sanggyun Kang, and Reid Ewing</i>	917
Relationships among Chemistry, Rheology, and Fracture/Fatigue Performance of Recovered Asphalt Binders and Asphalt Mixtures Containing Reclaimed Asphalt Pavement <i>Peyman Barghabany, Wei Cao, Louay N. Mohammad, Samuel B. Cooper, III, and Samuel B. Cooper, Jr.</i>	927
Review of Usage of Real-World Connected Vehicle Data <i>Yun Zhou and Raj Bridgelall</i>	939
Utilizing Agent-Based Modeling to Evaluate Operational Impacts of an Incident and Possible Alternatives on U.S. Waterways <i>Janey Camp, Katherine Nelson, Craig E. Philip, Miguel Moravec, Douglas W. Scheffler, and Paul Johnson</i>	951
Simplified Comparison of Oversize and Overweight Vehicles Permit Fee Structure in the U.S. Western States <i>Ehsan Dehghan-Niri, Douglas D. Cortes, Sina Zamen, Fernando Alvidrez, and David Jauregui</i>	963
Construction Quality Control of Unbound Base Course using Light Weight Deflectometer Where Reclaimed Asphalt Pavement Aggregate Is Used as an Example <i>Emre Akmaz, Saad Ullah, Burak F. Tanyu, and Erol F. Guler</i>	989