Research on Passenger Demand Prediction for Airport Express ..........................788
Xiang-nan Li, Jie Xiong, Yan-yan Chen, Qiang Li, and Chen-yu Bai

Dynamic Trajectory Planning for Autonomous Vehicle Considering
Driving Risk Field.................................................................802
Zhe Wang, Ye Tian, Xin Pei, and Yi Zhang

Experimental Study on Performance of V2X Communication
Applied in Typical Traffic Systems in a Closed Test Scenario.........................812
Xinrui Zhang, Runmin Wang, Xiangmo Zhao, Zhigang Xu, and Feng Zeng
### Transportation Infrastructure Engineering

**A Cooperative Lane Change Model for Connected Vehicles on Two-Lane Highway** ................................................................. Kang Sun, Xiangmo Zhao, and Xia Wu 825

**Extraction of Traffic Parameters at Urban Intersections Using the Low-Altitude Unmanned Aerial Vehicle Image** .................. Can Yang, Junjie Zhang, Hongbo Li, Haiyang Yu, and Yongzheng Xu 838

**Improving the Efficiency of On-Ramp Control Strategy by Determining Its Critical Threshold** ............................................ Hao Ren, Jianjun Wang, and Yushan Jiang 848

**Analysis of Spatio-Temporal Feature Extraction and Hot Spot Detection Based on Didi Data** ............................................ Sa Wang, Hong Chen, and Jing Yang 859

**Application of IoT Based Stick for Visually Impaired People in CVIS System** ................................................................. Ammar Muhammad, Qizhou Hu, Muhammad Tayyab, Yikai Wu, and Muhammad Ahtsham 871


**Design and Application of Mix Proportion of Fully Recycled and Pervious Cement Concrete for the Haze Removal Pavement** .... LianDi Zhao, RenShan Chen, ZhiZhong Zhao, Jin Li, and Wei Zhang 894

**Study on Net Distance between Tunnel Exit and Main Toll Station of Mountain Expressway Based on Operation Speed** .......... Zemin Yi, Zhongping Jia, and Jinliang Xu 904

**Matching Design of Tram Flexible Block Structure and Material** ................................................................. Wanqing Zhang, Jinyan Zhu, Ying Cheng, Chen Liu, and Rongchun Shi 913

**Critical Stress Analysis in Airfield Jointed Plain Concrete Pavements with Voids underneath Slabs** .................................... Jufei Zhao, Hongduo Zhao, Lukuan Ma, and Jiake Zhang 919

**Analysis of Adaptability of Porous Asphalt Mixture to Heavy-Duty Asphalt Pavements** .................................................. Haoyang Wang 931

© ASCE
Effects of Vehicle Loads and Structure Combinations on Rutting Depth of Asphalt Pavements with Varied Base Layers in Toll Plazas .......... 944
Yan Li, Yanlong Han, Yuanbo Cao, Jiupeng Zhang, Fuyu Wang, Liantian Gao, and Tian Qu

Simulation of Interval Excavation of Marble Slope by ABAQUS Finite Element Method ........................................................................ 957
Qingli Zhang, Kangming Wang, Changqing Jiao, Wen Zhu, Jiayu Wang, and Junyuan Ge

Research on Road Performance of Titanium Gypsum Used in Cement Stabilized Crushed Stone .................................................................... 967
Zhizhong Zhao, Hongzhe Liu, Yulong Zhao, Risheng Wang, Guiqiang Liu, and Zhenyu Yang

Research on Stability of Marlstone Slope by Different Excavation Methods ......................................................................................... 977
Yulong Zhao, Min Li, Yilong He, Zhizhong Zhao, Risheng Wang, and Yunhua Su

Research on Control Index of Interval Excavation Construction of Marl Slope ......................................................................................... 988
Zhizhong Zhao, Yilong He, Zhenyu Yang, Yulong Zhao, Hongzhe Liu, and Yunhua Su

Migration Analysis of Periodic Layered Slab Track on Environment Vibration under Inter-City Train Running with Finite Element Method ........ 999
Changxuan Lu, Xinwen Yang, and Xiaobo Liu

Research on Physical Depreciation Methods of Non-Toll Road Assets .......... 1011
Jie Deng, Xu Han, Zongjun Pan, Junzhe Wang, Hai Zhang, Gong Geng, and Chen Ling

Evaluating the Operational Features of Superelevation of Truck-Only Interchange Ramp with Simulation in General Regions .................. 1022
Binghong Pan and Xiang Li

Research on Operating Speed Model for Passenger Car on Deceleration Lane of Expressway ................................................................. 1033
Mingyu Hou and Jianchuan Cheng

Study on the Suitability of Various Test Methods for Evaluating High Temperature Performance of New Asphalt Mixtures ..................... 1045
Huijun Shao, Shitong Liu, Yu Lu, Xiaosheng Zhang, and Haiting Liu
Study on the Influence of Different Modification Processes on the Internal Material Aggregation of SBS Modified Asphalt Using DSC
Cheng Du, Hui-Jun Shao, Ming-Sheng Gao, Guang-Lai Jin, and Peng Jia

Integrating BIM and VR for Highway Construction Site Layout Planning
Sheng Xu, Denglin Fu, Yuanfang Xie, Lei Hou, and Shanshan Bu

Research on Analysis Method of Pavement Construction Quality Uniformity Based on Statistical Principle
Jing-feng An, Chen Jiang, Hui-jun Shao, Cheng Du, and Guang-lai Jin

Analysis of Natural Environmental Freeze-Thaw Cycles along the Qinghai-Tibet Highway
Wei Si, Yong-Ping Hu, Xing-Xiang Kang, Duo-Jie Ci-Dan, Long-Zhu Ren-Qian, and Biao Ma

Performance Study of RC Hollow Core Slab with Cracks Based on Extended Finite Element Method (XFEM)
Zhao-Hua Yuan, Chao Ma, Shu-Yu Yang, and Pei-Zhi Wang

A Smart Dual Traffic Light Control System Based on Greedy Strategy
Weizhi Zhang, Shuai Wang, Wei Han, and Yueyuan Zhu

Research on the Operational Efficiency of the Two-Way Left-Turn Lane
Tingwen Zhou, Yuetong Zhou, and Binhong Pan

Stabilizing Soft Ground Using Geopolymer: An Experimental Study
Yue Zhu, Rui Chen, and Hongpeng Lai

A Remaining Useful Life Estimation Method for Freeway Electromechanical Power Supply Equipment Based on Sensitive Parameters
Hongke Xu, Dongwei Liu, Shan Lin, Jun Niu, and Zhan Wang

Effects of Structural Factors on Rutting of PCC+AC Composite Pavements for Tollgates
Guangcan Li, Pingchuan Wei, Mingliang Zhang, Jiupeng Zhang, Fuyu Wang, Ji Zhang, and Tian Qu

Design and Construction Optimization of the Joint in the Mixed Steel-Concrete Arch Bridge
Haixiao Xu and Juntao Zheng
Length Design of Mountainous Highway Tunnel Transition Section at Entrance and Exit Based on Temperature Field ............................................ 1193
Xiaqing Wang, Xingxiang Kang, and Biao Ma

Aggregate Motion Characteristics of Porous Asphalt Concrete under Vibration Compaction Conditions Based on Image Processing ..................... 1206
Yang Li, Baowen Xie, Ruixuan Hou, and Haiyang Yang

Intersection Angle Design Based on Drivers' Visual Characteristics and SSD .......................................................................................... 1218
Yuetong Zhao, Binghong Pan, Tingwen Zhou, and Shanshan Wei

Study on the Length of Median Opening in Expressway Reconstruction and Extension Work Zones .......................................................... 1233
Changqiao Shao, Sen Ma, Kai Luo, and Yang Qin

Research and Application of Data Preprocessing of Highway Slope Deformation Monitoring System .............................................................. 1246
Xiongwei Zhang, Ting Peng, Linhai Mo, Jie Liu, and Xiaoling Wang

Airport Expressway Security Facilities Program Evaluation Based on Fuzzy Comprehensive Evaluation .......................................................... 1258
Yanyan Chen, Zeqian Jin, and Chen Li

Optimization Model of Electric Vehicle Charging Station Layout .................. 1269
Jiayi Zhao, Linshuying Huang, Xinli Lv, Jinzhao Wang, and Jianyuan Yin

Operating Speed Model of Passenger Car at Exit Ramp of Trumpet-Shaped Interchange ................................................................. 1281
Cheng Liu, Yifei Zhao, Jiaqing He, Zhongyi Chen, and Shunchao Yin

Slope Sliding Warning System Based on Image Comparison Algorithm ................................................................. 1293
Zhenyu Yang, Yulong Zhao, Zhizhong Zhao, Risheng Wang, Hongzhe Liu, and Lulu Wang

Research on Durability Preventative Maintenance Technology of Steel Plate Composite Beam Bridges with Small and Medium Span: Review .......... 1305
Li-Wei Lu, Yong-Jian Liu, Bo-Wen Feng, and Ze-Jun Zhang

Research on Vehicle-Bridge Coupling Vibration and Impact Coefficient of Highway Suspension Bridge ...................................................... 1318
Fangwen Wu, Wei Zheng, Jianfei Luo, and Cheng Cai
Bridge Surface Damage Image Stitching Method Based on SURF Algorithm ............................................................... 1330
Xingyu Da, Xiali Wang, Xin Yu, and Lihong Wang

Crack Detection Algorithm of Complex Bridge Based on Image Process .... 1341
Xin Yu, Xiali Wang, Xingyu Da, and Jiaxing Zhao

The Performance of Wooden Bamboo Barrier ........................................ 1354
Wei-Wei Dai, Jian-Wei Xu, Zhong-Yi Chen, Yi-Fei Zhao, and Cheng Liu

Study on Safe Distance between Tunnel Exit and Interchange Exit in Expressway ......................................................... 1366
Jiaqing He, Yifei Zhao, Cheng Liu, Jun Wand, and Weiwei Dai

Deformation Monitoring for Tunnel Surrounding Rock Based on Binocular Vision Systems .............................................. 1378
Xuan Zheng, Li-ping Li, Xue Li, and Zhi Li

Simulation Analysis of Glare in Highway Tunnel Lighting .................. 1390
Xuan Zheng, Zhi Li, Xue Li, and LiPing Li

Fragility Analysis of Continuous Rigid Frame Bridge with Tall Piers ...... 1403
Fangwen Wu, Jianfei Luo, Wei Zheng, and Cheng Cai

Influence of Color Temperature in Highway Tunnels on Response Time of Driver .......................................................... 1413
Xuan Zheng, Yunliang Yao, Qianqian Shi, and Xue Li

Study on CO Emission Factors of Passenger Cars in Urban Highway Tunnels at Different Speeds ...................................... 1424
Xuan Zheng, Jiaxin Shi, and Xue Li

Spatial Layout Optimization of Jet Ventilation Fan for the Rectangular Large Section Underwater Tunnel ................................ 1435
Xuan Zheng, Shuai Fu, Xue Li, Liping Li, and Yi Lu

Numerical Simulation of CO Distribution in Construction Area of Single-Shaft and Multi-Face High-Cold Highway Tunnel ......... 1448
Xuan Zheng, Lei Gao, and Xue Li

Pollutant Diffusion and the Length of Mid-Partition Wall of Twin Portals for Large Cross Section Underwater Tunnel ............... 1461
Xuan Zheng, Shuai Fu, Xue Li, Liping Li, and Fang Tian
Accident Characteristics and Formation Mechanism of the Road Section with Insufficient Sight Distance on Median Strip of Freeway ..........1474
Shun-chao Yin, Yi-fei Zhao, Jun Wang, Jia-qing He, and Fei-quan Li

Fiber-Reinforced Asphalt Macadam Sealing with Rubber Particles and Its Ice-Breaking and Snow-Melting Properties .......................................................1485
Ailing Yao, Shaoyong Yu, Jinpeng Li, Haidong Di, and Yubo Wang

A Cloud Platform for Bridge Health Monitoring Based on BIM+GIS ..........1498
Bo Zhang, Zhiqi Liu, Jing Wang, Jinbo Tian, and Jian Wang

Research Progress of Nano-SiO\textsubscript{2} Modified Asphalt Binders in Road Engineering .................................................................1508
Chen Li and Wenhao Dong

Research on TEI Acquisition and Exchange Architecture for CVIS ..........1521
Tao Chen, Congshuai Guo, Bin Chen, Qisheng Huang, and Linkun Fan

System Design of 3D Reconstruction of Rock Deformation in Tunnels Based on a Deep Convolutional Neural Network .............................................1531
Xiaoguang Zhang, Xuan Zheng, Shuai Fu, Xue Li, and Lipeng Cong

Experimental Study on Collapsibility of Coarse-Grained Saline Soil Subgrade in the Qarhan Salt Lake Area, Western China .........................1546
Qi Wan, Xiaohua Yang, Dingle Ma, and Han Bao

Prediction of Subgrade Slope Slip Based on Centroid Movement Algorithm .................................................................1558
Risheng Wang, Wenwen Chen, Xanliang Yan, Jigou Yang, Lingnan Lin, and Xuegang Zhang