

# 公路交通科技

JOURNAL OF HIGHWAY AND TRANSPORTATION  
RESEARCH AND DEVELOPMENT

2022年12月 第39卷 第12期

Vol. 39 No. 12

ISSN 1002-0268



中华人民共和国交通运输部 主管  
交通运输部公路科学研究所 主办

## 目 次

### · 道路工程 ·

基于高抗剪密实型的泡沫沥青冷再生混合料中粒式级配设计 .....	李秀君 赵麟昊 高世柱 欧阳欢 王宁宁 (1)
基于厂拌热再生的复合改性橡胶沥青应力吸收层抗裂性能研究 .....	祝谭雍 段卫党 许 兵 黄晓明 (8)
热再生沥青混合料 RAP 分散情况的多尺度分析 .....	陈铁军 (17)
永久性路面面层高掺量橡胶沥青材料路用性能研究 .....	杨 毅 龚 演 郑 俞 石长洪 刘军海 (27)
CFB 灰渣制备轻质早强小型预制构件研究与应用 .....	解卫江 李卫红 王宇强 李海潮 郭子强 (36)
煅烧铝矾土路用超薄磨耗层配合比设计及性能评价 .....	王志斌 邱文利 张 博 赵晓瑞 盛燕萍 (45)
基于分数阶导数的冻土损伤蠕变模型研究 .....	闫有民 单静云 刘志义 (53)
BFRP-CRCP 配筋设计方法和参数敏感性分析 .....	冀志远 王晓帆 周 舟 (60)

### · 桥梁工程 ·

考虑长径比影响的黄土地区钻孔灌注桩桩侧摩阻力取值研究 .....	薛振年 田叶青 董亚琴 周志军 (67)
改进 EMD 和 COV-SSI 在桥梁结构模态参数识别中的运用 .....	尹红燕 唐 莉 刘东霞 (75)
连续梁桥合龙段混凝土纵向裂缝成因分析及改善措施 .....	张万朋 刘 文 张文学 吴淑康 (86)
基于改进经验小波变换的桥梁模态参数识别 .....	秦世强 唐 剑 冯嘉诚 (94)
桥梁挡风障参数对行车稳定性影响分析 .....	王兆樑 练江峰 詹锐臻 刘功毫 林 立 (106)
上坝夹江大桥钢箱梁施工方案比选及关键技术 .....	田雨金 周胜国 李 亮 (115)
曲线独柱型钢塔精准安装关键技术 .....	周 畅 田雨金 李 亮 (125)

### · 隧道工程 ·

微生物修复混凝土裂缝的力学性能试验研究 .....	周 耀 王若琪 刘 斌 门 杰 李晓敏 (134)
---------------------------	---------------------------

### · 智能交通 ·

考虑前后不对称网联多车跟驰模型及数值仿真 .....	张柯娜 王来军 洪中荣 (139)
基于视频图像和深度学习的车辆轨迹检测与跟踪 .....	李志坚 郭玉彬 赵建东 (149)

### · 交通安全 ·

高速公路交通事故持续时间计算方法研究 .....	吕 路 李 杰 郭忠印 阎 莹 高超 (155)
基于 Vissim 建模的高速公路作业区混合车辆上游过渡区空间安全性研究 .....	王晓飞 丁振中 刘 永 王孝冬 (163)
考虑车型与道路线形的山区公路货车事故严重程度影响因素辨识 .....	曹 瑞 戢晓峰 覃文文 (171)
基于制动鼓温升的连续下坡超长隧道路段纵坡可靠度研究 .....	袁飞云 张黎明 王 韩 吕 博 张 驰 (179)
高速公路连续下坡路段货车追尾风险评价研究 .....	邹海云 刘 锴 张 驰 马如鹏 王 博 (188)

### · 城市交通 ·

基于价格弹性和行为选择的共享停车动态定价方法研究 .....	汪义路 叶晓飞 李 敏 陈 峻 闫星辰 (196)
基于深度学习的慢行交通方式选择行为预测模型 .....	陈文强 王雪梅 王 涛 高超 李 琼 (204)
基于模糊逻辑算法的增程式电动汽车控制策略研究 .....	都雪静 王 宁 崔淑华 (213)

### · 环境工程 ·

南方红壤丘陵区公路路域生态脆弱性空间分异规律 .....	李春强 王 琳 刘智才 刘 辉 张冬珠 (224)
------------------------------	---------------------------

### · 物流工程 ·

疫情暴发初期应急医疗物资配送优化研究 .....	赵银婷 徐晓敏 周 行 (231)
--------------------------	-------------------

### · 运输经济 ·

高速公路建设管理现代化理论研究与实践探索 .....	马书红 王元庆 岳 敏 陈西芳 杨 涛 (239)
时间窗约束下多式联运企业收益分配优化模型研究 .....	朱文英 赵 雨 张红英 牛雨晨 高超 (247)

## CONTENTS

Medium-sized Gradation Design of Foamed Asphalt Cold Recycled Mixture Based on Higher Anti-shearing Dense Type	LI Xiu-jun, ZHAO Lin-hao, GAO Shi-zhu, OUYANG Huan, WANG Ning-ning ( 1 )
Study on Crack Resistance of Stress Absorbing Layer of Compound Modified Rubber Asphalt Based on Plant-mixing Hot Recycling Technology	ZHU Tan-yong, DUAN Wei-dang, XU Bing, HUANG Xiao-ming ( 8 )
Multi-scale Analysis on RAP Dispersion in Recycled Hot Mix Asphalt Mixture	CHEN Tie-jun (17)
Study on Road Performance of High Content Rubber Asphalt Material for Permanent Pavement Surface Layer	YANG Yi, GONG Yan, ZHENG Yu, SHI Chang-hong, LIU Jun-hai (27)
Study on Lightweight Early Strength Small Prefabricated Components Made from CFB Slag and Its Application	XIE Wei-jiang, LI Wei-hong, WANG Yu-qiang, LI Hai-chao, GUO Zi-qiang (36)
Mix Proportion Design and Performance Evaluation of Ultra-thin Friction Course with Calcined Bauxite for Pavement	WANG Zhi-bin, QIU Wen-li, ZHANG Bo, ZHAO Xiao-rui, SHENG Yan-ping (45)
Study on Damage Creep Model of Frozen Soil Based on Fractional Derivative	YAN You-min, SHAN Jing-yun, LIU Zhi-yi (53)
Analysis on Reinforcement Design Method and Parameter Sensitivity of BFRP-CRCP	JI Zhi-yuan, WANG Xiao-fan, ZHOU Zhou (60)
Study on Value of Lateral Friction Resistance of Bored Cast-in-situ Pile in Loess Area Considering Influence of Length-diameter Ratio	XUE Zhen-nian, TIAN Ye-qing, DONG Ya-qin, ZHOU Zhi-jun (67)
Application of Improved EMD and COV-SSI in Bridge Structure Modal Parameters Identification	YIN Hong-yan, TANG Li, LIU Dong-xia (75)
Analysis on Cause of Concrete Longitudinal Cracks in Closure Segment of Continuous Beam Bridge and Improvement Measures	ZHANG Wan-peng, LIU Wen, ZHANG Wen-xue, WU Shu-kang (86)
Bridge Modal Parameter Identification Based on Improved Empirical Wavelet Transform	QIN Shi-qiang, TANG Jian, FENG Jia-cheng (94)
Analysis on Influence of Bridge Wind Barrier Parameters on Driving Stability	WANG Zhao-liang, LIAN Jiang-feng, ZHAN Kai-zhen, LIU Gong-hao, LIN Li (106)
Construction Scheme Selection and Key Technology for Steel Box Girder of Shangba Jiajiang Bridge	TIAN Yu-jin, ZHOU Sheng-guo, LI Liang (115)
Key Technology of Curved Single-column Steel Pylon Precise Installation	ZHOU Chang, TIAN YU-jin, LI Liang (125)
Experimental Study on Mechanical Properties of Concrete Cracks Repaired by Microorganism	ZHOU Yao, WANG Ruo-qi, LIU Bin, MEN Jie, LI Xiao-min (134)
Connected and Automated Multi-vehicle Following Model and Numerical Simulation Considering Front and Rear Asymmetry	ZHANG Ke-na, WANG Lai-jun, HONG Zhong-rong (139)
Vehicle Trajectory Detection and Tracking Based on Video Image and Deep Learning	LI Zhi-jian, GUO Yu-bin, ZHAO Jian-dong (149)
Study on Calculation Method of Expressway Accident Duration	LÜ Lu, LI Jie, GUO Zhong-yin, YAN Ying, GAO Chao (155)
Study on Spatial Security of Expressway Work Area Upstream Transition Zone with Mixed Vehicles Based on Vissim Modeling	WANG Xiao-fei, DING Zhen-zhong, LIU Yong, WANG Xiao-dong (163)
Identifying Factors Influencing Injury Severity of Truck-involved Crashes Considering Truck Type and Mountainous Road Alignment	CAO Rui, JI Xiao-feng, QIN Wen-wen (171)
Study on Longitudinal Slope Reliability of Continuous Downhill Ultra-long Tunnel Section Based on Brake Drum Temperature Rise	YUAN Fei-yun, ZHANG Li-ming, WANG Han, LÜ Bo, ZHANG Chi (179)
Study on Risk Evaluation of Truck Rear-end Collision in Continuous Downhill Section of Expressway	ZOU Hai-yun, LIU Kai, ZHANG Chi, MA Ru-peng, WANG Bo (188)
Study on Shared Parking Dynamic Pricing Method Based on Price Elasticity and Behavior Choice	WANG Yi-lu, YE Xiao-fei, LI Min, CHEN Jun, YAN Xing-chen (196)
Prediction Model of Non-motorized Traffic Mode Selection Behaviors Based on Deep Learning	CHEN Wen-qiang, WANG Xue-mei, WANG Tao, GAO Chao, LI Qiong (204)
Study on Control Strategy of Extended Range Electric Vehicle Based on Fuzzy Logic Algorithm	DU Xue-jiang, WANG Ning, CUI Shu-hua (213)
Spatial Variation of Highway Area Ecological Vulnerability in Red Soil Hilly Region of Southern China	LI Chun-qiang, WANG Lin, LIU Zhi-cai, LIU Hui, ZHANG Dong-zhu (224)
Study on Optimization of Distribution of Emergency Medical Supplies in Early Stage of Epidemic	ZHAO Yin-ting, XU Xiao-min, ZHOU Hang (231)
Theoretical Study and Practical Exploration of Modernization of Expressway Construction Management	MA Shu-hong, WANG Yuan-qing, YUE Min, CHEN Xi-fang, YANG Tao (239)
Study on Income Distribution Optimization Model of Multimodal Transport Enterprise under Time Window Constraint	ZHU Wen-ying, ZHAO Yu, ZHANG Hong-ying, NIU Yu-chen, GAO Chao (247)