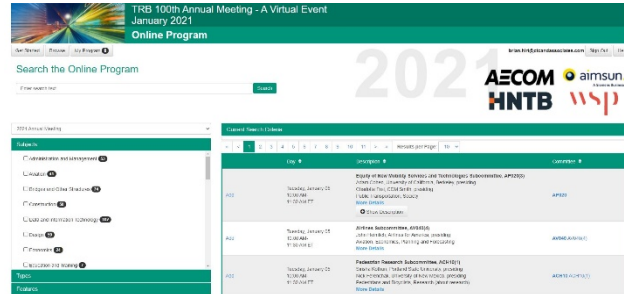# Maintenance at the 2021 TRB Annual Meeting (Virtual Event)

Resource Spotlight: *TRB Annual Meeting Online Program*

If you're searching for the latest research on a transportation topic, be sure to visit the TRB Annual Meeting Online Program. The program includes papers, posters and presentation materials from the upcoming 2021 Annual Meeting as well as the previous three meetings.

Below we've compiled selected links to the poster, presentations and papers related to maintenance to be presented at the 2021 Annual Meeting. **Registration, attendance, and access to materials is free for employees of state DOTs and other TRB Sponsor organizations.** Sign in to the Online Program to access all the resources shown here.

If you have trouble accessing this information, check with your DOT or other transportation library. Note that all times listed are Eastern Standard, and all details are subject to change.

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Asset Management

Pavement Management

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Fedgdi Guo, Jeremy Gregory
Massachusetts Institute of Technology (MIT)

21-02107 Detection of Pavement Maintenance Treatments Using Deep-Learning Network (January 26, 1-2:30 p.m. ET)
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Lu Gao, Yao Yu, Yi Hao Ren, Pan Lu
University of Houston; Independent Scholar; North Dakota State University

21-03008 Developing a Priority Model for Urban Roads Maintenance at a Network Level Based on Multi-Quantitative Criteria (January 25, 1-2:30 p.m. ET)
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Jazan University

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Florida Department of Transportation

21-03943 Development of Roughness Prediction Models for Life Cycle Assessment Studies of Recycled Pavement Projects (January 25, 4-5:30 p.m. ET)
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Eugene Amarh, Gerardo Flintsch, Joao Santos, Brian Diefenderfer
Virginia Polytechnic Institute and State University; Universiteit Twente; Virginia Transportation Research Council

21-00261 Effectiveness and Cost-Effectiveness Evaluation of Pavement Maintenance Treatments Based on Multiple Regression Analysis and Life-Cycle Cost Analysis (January 26, 1-2:30 p.m. ET)
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Yuanyuan Pan, Yue Shang, Ye Xing, Guoqiang Liu, Anqi Chen, Yongli Zhao
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21-02772 Evaluation of Accuracy of Performance Prediction Utilizing AASHTOware PavementME Software of Composite Long-Term Pavement Performance Sections (January 27, 10-11:30 a.m. ET)
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Harshdutta Pandya, Daniel Offenbacker, Yusuf Mehta
Rowan University

21-03602 Five-Year Project-Level Statewide Pavement Performance Forecasting Using a Two-Stage Machine Learning Approach Based on LSTM (January 25, 1-2:30 p.m. ET)
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Alexander Bukharin, Yichang Tsai
Georgia Tech

21-03875 Framework for Leveraging Data from Autonomous Trucks to Support State Maintenance Operations (January 26, 2:30-4 p.m. ET)
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Morgan Avera, C. Michael Walton
University of Texas, Austin

21-00841 Impacts of Automated Vehicles on Highway Infrastructure (January 26, 10-11:30 a.m. ET)
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Paul Carlson
Road Infrastructure, Inc.

21-20027 Implementation of Unmanned Aerial Systems (UASs) for Assessment of Transportation Infrastructure (January 21, 10 a.m.-1 p.m. ET)
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Steve Cook
Michigan Department of Transportation

21-04227 International Roughness Index Model for Jointed Plain Concrete Highway Pavements: An Artificial Neural Network Application (January 26, 10-11:30 a.m. ET)
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Salma Sultana, Hakan Yasarer, Waheed Uddin, Rulian Barros
University of Mississippi

21-03687 Joint Optimization of Multi-Scale Decisions in Budget Allocation, Inspection Frequency and Maintenance Policies for Transportation Infrastructure Systems (January 26, 2:30-4 p.m. ET)
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Heeseung Shon, Jinwoo Lee
Korea Advanced Institute of Science and Technology (KAIST)

21-01962 Life Cycle CO2 Emissions for Maintenance Construction Activities of the Arterial Highway (January 25, 11:30 a.m.-1 p.m. ET)
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21-01770 Minimizing the Global Warming Potential of Pavement Infrastructure Through Reinforcement Learning (January 26, 1-2:30 p.m. ET)
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University of British Columbia

21-03174 Multi Asset Hotspot Analysis for Predictive Roadway Maintenance (January 26, 2:30-4 p.m. ET)
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Arash Karimzadeh, Sepehr Sabeti, Hamed Tabkhi, Omidreza Shoghli
University of North Carolina, Charlotte

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Qingwen Zhou, Egemen Okte, Imad Al-Qadi
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21-03822 Towards Precise Road Sustainable Measurements and Agreeable Decisions: A Case Study in Texas (January 25, 11:30 a.m.-1 p.m. ET)
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Bridge Management

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University of Texas, Arlington

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Rebecca Curtis
Michigan Department of Transportation

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Ed Lutgen
Minnesota Department of Transportation

21-21009 Bridge Management Systems for Strategic Decision Making: Pennsylvania Experience
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Justin Bruner
Pennsylvania Department of Transportation

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C. Todd Springer
Virginia Department of Transportation

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21-01024 Element-Based Life-Cycle Improvement Module for Bridge Planning and Programming
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University of New Hampshire

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University of New Hampshire

21-00148 Forecasting Federal TPM Bridge Condition Measures for Bridge Management (January 28, 11:30 a.m.-1 p.m. ET)
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Paul Thompson
Paul D Thompson

21-00249 How Do Bridge Types and Maintenance Intervention Affect the Deterioration Process of Urban Bridges in Shanghai (January 28, 11:30 a.m.-1 p.m. ET)
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Yu Fang, Lijun SUN
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21-03952 Impact of Specialized Hauling Vehicles and Emergency Vehicles on the States' Load Rating and Posting Policies (January 26, 11:30 a.m.-1 p.m. ET)
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University at Buffalo, SUNY

21-01027 Network-Level Optimization Module for Bridge Planning and Programming (January 25, 2:30-4 p.m. ET)
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21-03265 A Performance-Based Approach for Deciding the Age of New Concrete for Thin Epoxy Overlay Application (January 28, 11:30 a.m.-1 p.m. ET)
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Upul Attanayake, Abul Mazumder
Western Michigan University

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Matthew Haynes, Erdem Coleri
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Nikola Tanasic, Rade Hajdin
Infrastructure Management Consultants, GmbH (IMC)

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John Siekmeier
Minnesota Department of Transportation

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Tsinghua University

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Ty Ortiz
Colorado Department of Transportation

21-03503 A National Survey and Roadmap on Complete Streets Implementation Status and its Asset Management (January 25, 2:30-4 p.m. ET)
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Georgia Institute of Technology (Georgia Tech); University of California, Davis

21-20094 Real-Time Signal Performance Measurement (RT-SPM) (January 27, 2:30-4 p.m. ET)
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Peter Jin, Thomas Brennan
Rutgers University; College of New Jersey

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Edward Hoppe
Virginia Department of Transportation

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Nathan Huynh, Terry Swygert
University of South Carolina; South Carolina Department of Transportation

21-03120 Traffic Sign Extraction Using Deep Hierarchical Feature Learning and LiDAR Data on Rural Highways (January 26, 2:30-4 p.m. ET)
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21-01864 Use of Mobile Photogrammetry Method for Highway Asset Management (January 26, 2:30-4 p.m. ET)
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Mohammad Farhadmanesh, Chandler Cross, Ali Hassandokht Mashhadi, Abbas Rashidi, Jessica Wempen
University of Utah

21-01717 Utilization and Cost Estimation Models for Highway Fleet Equipment (January 28, 2:30-4 p.m. ET)
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Mehrdad Tajalli, Amir Mirheli, Ali Hajbabaie, Leila Hajbabai
North Carolina State University

21-20096 Validating Change of Sign and Pavement Conditions and Evaluating Sign Retro-reflectivity Condition Assessment on Georgia's Interstate Highways Using 3D Sensing Technology (January 27, 2:30-4 p.m. ET)
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Yichang Tsai, Ernay Robinson-Perry, Brennan Roney
Georgia Institute of Technology (Georgia Tech); Georgia Department of Transportation

Bridge Repair and Rehabilitation

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Larry Grimenstein
Stronghold Coating Systems, Ltd

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21-20451 Steel Bridge Repairs Using Structural Adhesives as Steel Grout (January 26, 10-11:30 a.m. ET)
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Jason Provines
Virginia Transportation Research Council

Bridge Inspection

21-20093 Adaptation of 3D Scanning Technology for High Precision Bridge Inspection – Connecticut DOT (January 27, 2:30-4 p.m. ET)
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Andrew Mroczkowski, Alexandra Hain, Arash Esmaili Zaghi
Connecticut Department of Transportation; University of Connecticut

21-03632 Automated Detection and Quantification of Cracks and Spalls in Concrete Bridge Decks Using Deep Learning (January 26, 2:30-4 p.m. ET)
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Qianyun Zhang, Saeed Babanajad, Franklin Moon, Amir Alavi
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21-00402 A Bayesian Nonparametric Approach to AADT Estimation for Bridges (January 28, 11:30 a.m.-1 p.m. ET)
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Grace Ashley, Nii Attoh-Okine
University of Delaware

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Jean Nehme, Heng Liu, Raka Goyal
Federal Highway Administration (FHWA); NRC Research Associateship

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Sabrina Carroll, Joud Satme, Shadhan Alkharusi, Nikolaos Vitzilaios, Austin Downey, Dimitris Rizos
University of South Carolina

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Euiseok Jeong, Junwon Seo, James Wacker
South Dakota State University; U.S. Forest Service

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Jennifer Wells, Barritt Lovelace
Minnesota Department of Transportation; Collins Engineers, Inc.

21-03200 Modeling Impact Echo Data for Predicting Condition Rating (January 26, 11:30 a.m.-1 p.m. ET)
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Agnimitra Sengupta, S. Ilgin Guler, Parisa Shokouhi
Pennsylvania State University

21-02682 An Optimized ANN Ontology for Identifying Deterioration Patterns in the US Bridge Inventory (January 28, 11:30 a.m.-1 p.m. ET)
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Filippos Alogdianakis, Loukas Dimitriou, Dimos Charmpis
University of Cyprus

21-02304 Prediction of Load Resistance of a Slab on Steel I-Girder Bridge Due to Corrosion Progression with Climate Change Effects (January 26, 11:30 a.m.-1 p.m. ET)
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Istemi Ozkan, Husham Almansour, Dario Markovinovic
National Research Council Canada

21-00677 Probabilistic Deterioration Modeling of Bridge Element Condition with Random Effects (January 28, 11:30 a.m.-1 p.m. ET)
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Milhan Moomen, Chowdhury Siddiqui
South Carolina Department of Transportation

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Kent Nicholson
Iowa Department of Transportation

21-03559 Residual Strength of Reinforced Concrete Columns After Cover Spalling (January 26, 11:30 a.m.-1 p.m. ET)
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Nibras Khalid, Srikanth Marchetty, Mohamed Habouh, Anil Patnaik
University of Akron

21-01086 Self-Updating Method for Generalized Gamma Distribution-Based Bridge Deck Deterioration Model (January 28, 11:30 a.m.-1 p.m. ET)
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Muyang Lu, Jonathan Hydock, Aleksandra Radlińska, S. Ilgin Guler
Pennsylvania State University; Pennsylvania State University, University Park

21-01085 A Weibull Reliability Model of Bridge Deck Deterioration (January 28, 11:30 a.m.-1 p.m. ET)
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Culvert and Drainage Systems Maintenance

21-20072 Development and Implementation of Culvert Outlet Diffuser to Improve Stream Flow
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Dale Peabody, Alexander Mann
Maine Department of Transportation

21-03782 Mobile LiDAR Mapping of Roadside Ditches for Drainage Analysis (January 26, 2:30-4 p.m. ET)
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Yi chun Lin, Darcy Bullock, Ayman Habib
Purdue University

21-00136 Repair of Inverts of Corrugated Metal Pipe Culverts Using Engineered Cementitious Composite (January 27, 4-5:30 p.m. ET)
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H. Celik Ozyildirim, Mary Sharifi
Virginia Department of Transportation

Gravel Road Maintenance

21-20078 A Guide to Successfully Convert Severely Distressed Paved Roads to Engineered Unpaved Roads (January 27, 2:30-4 p.m. ET)
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Laura Fay, David Jones
Western Transportation Institute (WTI); University of California, Davis

Work Zones and Maintenance Worker Safety

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Celina Semaan, Steven Chien
New Jersey Institute of Technology

21-00456 Enhancing Construction Truck Safety at Work Zones: A Microscopic Traffic Simulation Study
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Zijin Wang, Jaeyoung Lee
University of Central Florida; Central South University

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Henry Brown
University of Missouri, Columbia

21-00767 Fast Safety Assessment and Correction Framework for Maintenance Work Zones (January 27, 1-2:30 p.m. ET)
Poster Session with abstract and full paper
Zhepu Xu, Qun Yang
Shanghai Institute of Technology; Tongji University

21-20088 Initial Analytical Investigation of Overhead Sign Trusses with Respect to Remaining Fatigue Life and Predictive Methods for Inspection (January 27, 2:30-4 p.m. ET)
Poster Session with abstract
Hayder Rasheed
Kansas State University

21-02296 A Multiple Correspondence Approach to Identify Contributing Factors Related to Work Zone Crashes (January 27, 1-2:30 p.m. ET)
Poster Session with abstract and full paper
Parisa Hosseini, Mohammad Jalayer, Subasish Das
Rowan University; Texas A&M University

21-02603 Trust in Automated Truck-Mounted Attenuators: A Survey on Worker Perceptions (January 26, 2:30-4 p.m. ET)
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Shiva Pourfalatoun, Erika Miller
Colorado State University

21-02029 Work Zone Intrusion Alarm Systems – Evaluation and Practical Implementation Guide for Work Zone Traffic Plans (January 27, 1-2:30 p.m. ET)
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Ghazan Khan, Kevan Shafizadeh
California State University, Sacramento

Pavement Monitoring and Evaluation

Pavement Condition Surveys

21-03949 Application of Machine Learning Based Technology in Pavement Condition Assessment and Prediction (January 25, 10-11:30 a.m. ET)
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Jiawei Gao, Chun-Hsing Ho, Igor Wiese, Dada Zhang, Marco Gerosa
Northern Arizona University

21-03720 Application of Mobile Terrestrial LiDAR Scanning Systems for Identification of Potential Pavement Rutting Locations (January 25, 10-11:30 a.m. ET)
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Afshin Famili, Wayne Sarasua, Alireza Shams, William Davis, Jennifer Ogle
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21-00056 Deep Learning and UAV Based Solution to Real Time Pavement Condition Assessment (January 27, 1-2:30 p.m. ET)
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Murad Al Qurishee, Weidong Wu, Babatunde Atolagbe, Joseph Owino, Ignatius Fomunung, Mbakisya Onyango
Tennessee Department of Transportation; University of Tennessee, Chattanooga; Maryland State Highway Administration

21-03970 A Framework for Integrated Infrastructure Condition Assessment and Traffic Assignment (January 26, 1-2:30 p.m. ET)
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Mirla Abi Aad, Montasir Abbas
Virginia Polytechnic Institute and State University

21-03128 Live Road Condition Assessment with Internal Vehicle Sensors (January 25, 10-11:30 a.m. ET)
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DTU Byg; Danmarks Tekniske Universitet; Vejdirektoratet; Sweco Danmark

21-02416 Spatial Roadway Condition-Assessment Mapping Utilizing Smartphones and Machine Learning Algorithms (January 25, 10-11:30 a.m. ET)
[Poster Session](#) with abstract
Charalambos Kyriakou, Symeon Christodoulou, Loukas Dimitriou
University of Cyprus

21-03866 Use of the Pavement Surface Condition Metric to Quantify Distresses from Digital Images (January 25, 10-11:30 a.m. ET)
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Danilo Balzarini, James Erskine, Michael Nieminen
International Cybernetics Co.

21-04008 Using Regression Analysis and Distribution Fitting to Analyze Sensing Patterns for Condition Assessments (January 28, 2:30-4 p.m. ET)
[Poster Session](#) with abstract and full paper
Dada Zhang, Chun-Hsing Ho, Fangfang Zhang
Northern Arizona University

Detecting, Evaluating and Monitoring Pavement Distress

21-03626 Automated Asphalt Pavement Raveling Detection and Classification Using Convolutional Neural Network and Macrotexture Analysis (January 25, 10-11:30 a.m. ET)
Poster Session with abstract and full paper
Yung-An Hsieh, Yichang Tsai
Georgia Institute of Technology (Georgia Tech)

21-03273 Automated Deep Learning-Based Approach for Pavement Crack Detection Using an Inexpensive Global Shutter RGB-D Sensor and Raspberry Pi Computer (January 26, 2:30-4 p.m. ET)
Poster Session with abstract and full paper
Pouria Asadi, Hamid Mehrabi, Alireza Asadi, Melody Ahmadi
University of Rhode Island; University of Guilan; Islamic Azad University

21-03383 Automated Detection and Classification of Pavement Distresses Using 3D Pavement Surface Images and Deep Learning (January 25, 10-11:30 a.m. ET)
Poster Session with abstract and full paper
Rohit Ghosh, Omar Smadi
Iowa State University

21-01258 Automatic Pixel-level Pavement Crack Detection Based on Stereovision Technology and Deep Learning (January 25, 10-11:30 a.m. ET)
Poster Session with abstract
Jinchao Guan, Xu Yang, Ling Ding, Jingwei Liu, Xiaoyun Cheng
Chang'an University; Monash University

21-01847 Bicycle Level of Service: Proposed Updated Pavement Quality Index (January 25, 10-11:30 a.m. ET)
Poster Session with abstract and full paper
Jiayun Huang, Nicholas Fournier, Alexander Skabardonis
University of California, Berkeley

21-21251 Characterization of Deterministic and Stochastic Fatigue Cracking in Asphalt Binder (January 26, 11:30 a.m.-1 p.m. ET)
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Hui Li
Zhejiang University

21-01019 Detection of Concealed Cracks from GPR Images Based on YOLO Series (January 25, 10-11:30 a.m. ET)
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Shuwei Li, Zingyu Gu, Xiangrong Xu, Dawei Xu, Tianjie Zhang, Qiao Dong, Zhen Liu
Southeast University; Nanjing Municipal Engineering Qualitu Inspection Center Station; Zhejiang Scientific Research Institute of Transport

21-01634 Developing a Climate Change Vulnerability Index for Pavement Infrastructure: A Case Study of Developing Countries (January 25, 11:30 a.m.-1 p.m. ET)
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Boris Goenaga, Saqib Gulzar, Benjamin Underwood
North Carolina State University

21-02125 Developing a Surrogate Performance-Related Test for Fatigue Cracking of Asphalt Pavement (January 26 2:30-4 p.m. ET)
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Liya Jiao, John Harvey, Mohamed Elkashef, Yanlong Liang, David Jones
University of California, Davis

21-01660 E* Master Curve Parameters as Potential Indicators of Cracking Susceptibility of Mixtures with Recycled Asphalt Shingles (January 26 2:30-4 p.m. ET)
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Fabricio Leiva-Villacorta, Adam Taylor
National Center for Asphalt Technology (NCAT); National Center for Appropriate Technology

21-00260 Field Observations and Laboratory Evaluations of Asphalt Pavement Maintenance Using Hot in-Place Recycling (January 26 2:30-4 p.m. ET)
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Southeast University

21-21246 Implementing Machine Learning to Evaluate Pavement Condition and Predict Asphalt Mixture Performance (January 26, 11:30 a.m.-1 p.m. ET)
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Hamed Majidifard
University of Missouri

21-20010 Importance of Pavement Structural Evaluation to Decision-Making Process (January 21, 2-5:00 p.m. ET)
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Soheil Nazarian
Center for Transportation Infrastructure Systems (CTIS)

21-21248 New Methodologies to Evaluate Asphalt Concrete Base Course Design, Construction Quality and Performance (January 26, 11:30 a.m.-1 p.m. ET)
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Johnnatan Garcia-Ruiz
Ohio University

21-03818 Non-Destructive Detection of Asphalt Concrete Stripping Damage Using Ground Penetrating Radar (January 25, 10-11:30 a.m. ET)
Poster Session with abstract
Ye Ma, Mostafa Elseifi, Nirmal Dhakal, Mohammad Bashar, Zhongjie Zhang
Louisiana State University; University of Colorado, Boulder, Louisiana Department of Transportation and Development

21-01620 A Novel Aging Model to Predict Fracture Parameter SCB Jc for Asphalt Mistures Using an Artificial Neural Network Approach (January 26 2:30-4 p.m. ET)
Poster Session abstract
Peyman Barghabany, jun Zhang, Louay Mohammad, Samuel Cooper, Gaylon Baumgardner
Louisiana Transportation Research Center (LTRC); Louisiana Department of Transportation and Development; Ergon Energy

21-02055 A Novel Adaptive Pixels Segmentation Algorithm for Pavement Crack Detection (January 25, 10-11:30 a.m. ET)
Poster Session with abstract
Nima Safaei, Omar Smadi, Babak Safaei, Arezoo Masoud
University of Iowa; Michigan State University

21-00138 Novel Approach for Evaluation of Pavements Affected by Pavement Tenting (Crack-Heaving): Integrated, Multi-Sensor Non-Destructive Testing System (January 25, 10-11:30 a.m. ET)
Poster Session with abstract and full paper
Eyoab Zegeye Teshale, Thomas Calhoon, Eddie Johnson, Shongtao Dai
Minnesota Department of Transportation; University of Minnesota

21-03252 Pavement Distress and Debris Detection Using a Mobile Mapping System with 2D Profiler LiDAR (January 25, 10-11:30 a.m. ET)
Poster Session with abstract and full paper
Radhika Ravi, Darcy Bullock, Ayman Habib
Purdue University

21-00932 Performance of Machine Learning Algorithms in Modeling Pavement Deterioration: A Meta-Analysis of IRI Prediction Models (January 25, 1-2:30 p.m. ET)
Poster Session with abstract
Mohammad Bashar, Cristina Torres-Machi
University of Colorado, Boulder

21-03629 Quantify Raveling Using 3D Technology with Loss of Aggregates as a New Performance Indicator (January 25, 10-11:30 a.m. ET)
Poster Session with abstract and full paper
Pingzhou Yu, Yichang Tsai
Georgia Institute of Technology (Georgia Tech)

21-00259 Relationship Between Rheological Indices and Cracking Performance of Virgin, Recycled and Rejuvenated Asphalt Binders and Mixtures (January 26 2:30-4 p.m. ET)
Poster Session abstract and full paper
Fawaz Kaseer, Amy Epps Martin, Edith Arámbula-Mercado
University of Florida; Texas A&M University, College Station; Texas A&M Transportation Institute

21-03800 Rutting Performance Prediction Using Index-Volumetrics Relationships with Stress Sweep Rutting Test and Hamburg Wheel-Track Test (January 26 2:30-4 p.m. ET)
Poster Session abstract and full paper
Jaehoon Jeong, Youngsoo Kim, Benjamin Underwood
North Carolina State University

21-00866 The Truth and Myth About the Cracking Mechanism of Asphalt Concrete (January 26 2:30-4 p.m. ET)
Poster Session abstract
Imad Al-Qadi, Izak Said, Uthman Mohamed Ali, Jameel Kaddo
University of Illinois, Urbana-Champaign

21-02904 Use of Time-Temperature Superposition Principle to Create Pavement Performance Mastercurves and Relate PCI and IRI (January 26, 1-2:30 p.m. ET)
Poster Session with abstract and full paper
Jose Medina, Akshay Gundla, Ali Zalghout, Samuel Castro, Kamil Kaloush
Arizona State University; GMU Geotechnical Inc.

Performance Management

21-03403 Assessing the Impact of Autonomous Vehicle on Pavement Performance and Service Life (January 25, 4-5:30 p.m. ET)
Poster Session with abstract
Alma Alfawal, Songsu Son
American University in Dubai

21-21247 Balanced/Performance Engineered Mixture Designs: Effect on Pavement Structure and Performance, Traffic Diversion, and User Costs (January 26, 11:30 a.m.-1 p.m. ET)
Poster Session
Rami Chkaiban
University of Nevada, Reno

21-01229 Life Cycle Assessment of Asphalt Pavements with Recycled Post-Consumer Polyethylene (January 25, 11:30-1 p.m. ET)
Poster Session with abstract and full paper
Milena Rangelov, Heather Dylla, Nadarajah Sivaneswaran
NRC; Federal Highway Administration (FHWA)

21-03544 Life Cycle Sustainability Assessment of Flexible Pavement Designs: A Case Study of Illinois Interstate Highway (January 25, 4-5:30 p.m. ET)
Poster Session with abstract and full paper
Abolfazi Seyrfar, Ibrahim Osman, Yahid Yarveicy, Mehmet Akbuga, Krishna R. Reddy
University of Illinois, Chicago

21-03289 Pavement Management Programs Based on Quantitative Performance Targets (January 26, 1-2:30 p.m. ET)
[Poster Session](#) with abstract
Muhammad Beg
AgileAssets Inc.

21-00285 Pavement Performance Modeling: Capturing the Effects of Quality Improvements (January 25, 2:30-4 p.m. ET)
[Poster Session](#) with abstract
Anuarbek Onayev, Omar Swei
University of British Columbia

21-00886 Pavement Performance Modeling with State PMS Network Data (January 25, 1-2:30 p.m. ET)
[Poster Session](#) with abstract and full paper
Hongbin Xu, Moo Yeon Kim, Christian Sabillon-Orellana, Jorge Prozzi
University of Texas, Austin

21-01332 Revisiting Thermal Models for Understanding the Effect of Climate Change on Pavement Performance and the Effect of Pavements on Urban Heat Islands (January 25, 4-5:30 p.m. ET)
[Poster Session](#) with abstract and full paper
James Bryce, Arka Chattopadhyay, Mehdi Esmaeilpour, Zack Ihnat
Marshall University

Pavement Repair and Rehabilitation Methods

Pothole Patching

21-03787 Pothole Repair in Asphalt Pavement: Current Practice and New Materials and Techniques (January 27, 10-11:30 a.m. ET)
[Poster Session](#) with abstract
Xiao Chen, Hao Wang, Giri Venkiteela
Rutgers University; New Jersey Department of Transportation

21-00811 A Review of Flexible Pavement Pothole Patching Methods and Guidelines in the United States (January 27, 10-11:30 a.m. ET)
[Poster Session](#) with abstract
Yujia Lu, Ramez Hajj
University of Illinois, Urbana-Champaign

Crack Sealing

21-03240 An Experimental Study on the Design and Behavior of Concrete Pavement Joint Sealants (January 27, 10-11:30 a.m. ET)
[Poster Session](#) with abstract and full paper
Jinho Kim, Dan Zollinger, Seunghyun Lee
Texas A&M University, College Station

21-20082 Full Depth Reclamation in Maintenance Operations Using Emerging Technologies (January 27, 2:30-4 p.m. ET)
Poster Session with abstract
Chris Glancy
Texas Department of Transportation

21-01689 Mechanistic-Empirical Faulting Prediction Model for Unbonded Concrete Overlays of Concrete (January 26, 10-11:30 a.m. ET)
Poster Session with abstract and full paper
Charles Donnelly, John DeSantis, Julie Vandenbossche, Steven Sachs
University of Illinois, Urbana-Champaign; University of Pittsburgh

21-00933 Modeling and Predicting Smoothness of Asphalt Overlays Using Network and Project Level Data (January 25, 1-2:30 p.m. ET)
Poster Session with abstract and full paper
Dingxin Cheng, Lerose Lane, Tom Pyle, Allen King
California State University, Chico; California Department of Transportation (CALTRANS)

21-02053 Quantitative Measurement of Crack Sealing Benefit Using 3D Laser Technology and 3-Year Crack Growth Measurement in the Field (January 27, 10-11:30 a.m. ET)
Poster Session with abstract and full paper
Zhongyu Yang, Xinyi Zhang, Yichang Tsai
Georgia Institute of Technology (Georgia Tech)

21-00174 Redevelopment of Artificial Neural Networks for Predicting the Response of Bonded Concrete Overlays of Asphalt for Use in a Faulting Prediction Model (January 26, 10-11:30 a.m. ET)
Poster Session with abstract
John DeSantis, Julie Vandenbossche
University of Illinois, Urbana-Champaign; University of Pittsburgh

21-04228 Roughness Modeling for Asphalt Overlay on Concrete Pavements Using Neural Networks (January 26, 10-11:30 a.m. ET)
Poster Session with abstract and full paper
Rulian Barros, Hakan Yasarer, Waheed Uddin, Salma Sultana
University of Mississippi

Chip Seals, Slurry Seals and Surface Treatments

21-00051 Benefit-Cost Approach for Using Continuous Friction Measurements to Choose a Pavement Surface Treatment (January 27, 4-5:30 p.m. ET)
Poster Session with abstract and full paper
Ross McCarthy, Gerardo Flintsch, Edgar de Leon Izeppi
Virginia Polytechnic Institute and State University

21-00309 The Effect of the Interaction Between Bituminous Seals and Their Substrates on the Performance of Road Pavements in Tropical Environments (January 27, 10-11:30 a.m. ET)
Poster Session with abstract and full paper
Andrew Otto, Jasper Cook
TRL Limited; Independent Consultant

21-02694 Experimental Evaluation of Chip Seal Interlayer Over Soil-Cement Bases as Reflective Crack Mitigation Technique (January 27, 10-11:30 a.m. ET)
Poster Session with abstract
Mohammad Khattak, Mohammad Bhuyan
University of Louisiana, Lafayette

21-00482 Performance and Engineering Application of Polymer-Modified Rejuvenating Emulsion (January 26 2:30-4 p.m. ET)
Poster Session abstract and full paper
Liang Fan, Rui Zhang, Gerald Huber, Minghao Mu, Chao Kong, Xishun Zhang
Shandong Transportation Institute; Shandong High Speed Materials Group Co. Ltd; Heritage Research Group; Shandong Hi-Speed Group; Shandong High Speed Materials Storage and Transportation Co., Ltd.; The Heritage Group

21-02501 Short-term Field Performance and Cost-Effectiveness of Crumb-Rubber Modified Emulsion in Chip Seal Applications (January 27, 10-11:30 a.m. ET)
Poster Session with abstract
Md Nafiur Rahman, Md Tanvir Ahmed Sarkar, Mostafa Elseifi, Corey Mayeux, Samuel Cooper Ken Free
Louisiana State University; Auburn University; Louisiana Department of Transportation and Development

21-04381 Water Film Depth Prediction Model for Chip Seal Surface Drainage (January 27, 10-11:30 a.m. ET)
Poster Session with abstract and full paper
Alireza Pourhassan, Ahmed Gheni, Mohamed ElGawady
Missouri University of Science and Technology

Roadside Maintenance

21-21099 Applying Remote Sensing to Rockfall Management Problems (January 29, 1-2:30 p.m. ET)
Lectern Session
Gabriel Walton
Colorado School of Mines

21-20464 Assessment of the Road Network Resiliency in the Presence of Road Maintenance Sites: An Environmental Perspective (January 26, 2:30-4 p.m. ET)
Poster Session with abstract
Behzad Bamdad Mehrabani
Université Catholique de Louvain

21-01462 Complementary Roadside Slope Repair Measures to Avoid Recurring Failures: The Case of Texas (January 26, 2:30-4 p.m. ET)
Poster Session with abstract
Seyed Ehsan Zahed, Bahram Abediniangerabi, Mohsen Shahandashti
VRX, Inc.; University of Texas, Arlington

21-20465 Preliminary Impacts of Reduced Mowing in Highway ROWs on Roadside Pollinator Abundance and Habitat Quality (January 26, 2:30-4 p.m. ET)
Poster Session with abstract
Kaitlin Stack Whitney
Rochester Institute of Technology (RIT)