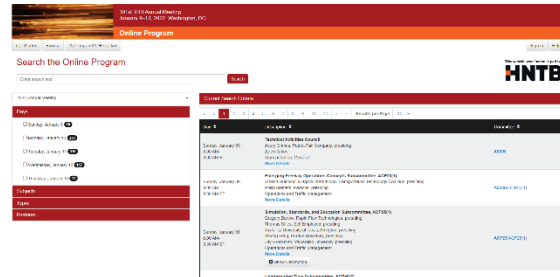




Maintenance Research at the 2022 TRB Annual Meeting

Resource Spotlight: Transportation Research Board Annual Meeting Online Portal

If you're searching for the latest research on a transportation topic, be sure to visit the [TRB Annual Meeting Online Program](#). The portal includes papers, posters and presentation materials from the 2019-2022 Annual Meetings.



The [No Boundaries Transportation Maintenance Innovations pooled fund](#) has compiled links to selected poster, presentations and papers related to maintenance presented at the 2022 Annual Meeting. **Registration, attendance, and access to materials is free for employees of state DOTs and other TRB Sponsor organizations.** If you have trouble accessing the papers, check with your DOT or other transportation library.

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Asset Management

This section includes pavement management, bridge management and managing other assets.

Pavement Management

22-03110 Adapting Treatments to Future Temperature Rise for Pavement Networks

[Poster Session](#) with abstract

Fengdi Guo, Hessam Azarijafari, Jeremy Gregory, Randolph Kirchain
Massachusetts Institute of Technology (MIT)

22-02235 Are New Pavement Condition Indices Necessary for Long-Poor Pavements?

[Poster Session](#) with [presentation](#)

Thomas Calhoon, Mihai Marasteanu, Shannon McGrath
Minnesota Department of Transportation; University of Minnesota, Twin Cities

22-01028 Alternative Horizontal Markings Along Curved Exit Terminal Ramps to Improve Driver Safety-Related Performance

[Poster Session](#) with [presentation](#)

Giorgia Raimondo, Alessandra Lioi, Abrar Hazoor, Alberto Portera, Luca Tefa, Marco Bassani
Politecnico di Torino

22-20058 Building Environmental Considerations into Pavement Management

[Lectern Session](#) with [presentation](#)

Gerardo Flintsch
Virginia Polytechnic Institute and State University

22-02808 Conspicuity of Various Colored Express Lanes Delineators: Matching or Contrast?

[Poster Session](#) with [presentation](#)

Hatem Abou-Senna, Patricia Tice, Mohamed El-Agroudy, Gail Holley, Mustapha Mouloua, Essam Radwan
University of Central Florida; VHB; Florida Department of Transportation

- 22-00926 Development of an Automated and Integrated Algorithm in Determining Optimum Maintenance and Rehabilitation Strategies Considering Multi-Lane Roadways**
[Poster Session](#) with abstract
Thai Son Tran, Julius Flores, Hyun Jong Lee, Kideok Kim, Hyun Wook Kim
Sejong University; IRIS Technology Company
- 22-04879 Development of International Roughness Index Prediction Models Using Long-Term Pavement Performance and Minnesota Road Research Facility Databases**
[Poster Session](#) with abstract
Michelle Beckley, Ali Zalghout, Jose Medina, Kamil Kaloush,
Y2K Engineering, LLC; GMU Geotechnical, Inc.; Arizona State University, Tempe
- 22-04571 An Economic Pavement Management Framework for Extremely Budget- and Resource-Constrained Agencies in Canada**
[Poster Session](#) with [presentation](#)
Shajib Guha, Kamal Hossain, Mitchell Lawlor
Memorial University of Newfoundland; Carleton University
- 22-20046 An Enhanced Georgia Department of Transportation Pavement Preservation Guide with Optimal Timing of Pavement Preservation**
[Poster Session](#) with abstract
Brennan A. Roney, Yi-Chang Tsai
Georgia Department of Transportation; Georgia Institute of Technology (Georgia Tech)
- 22-03904 Estimating the International Roughness Index Based on Pavement Distress Type, Density, and Severity: Insights from Machine Learning Techniques**
[Poster Session](#) with abstract
Yu Qiao, Sikai Chen, Majed Alinizzi, Miltos Alamaniotis, Samuel Labi
Purdue University
- 22-01908 Imputation Techniques to Reduce Uncertainties in the Network-Level Pavement Condition Predictions**
[Poster Session](#) with [presentation](#)
Boris Goenaga, Deepika Karanam, B. Underwood
North Carolina State University
- 22-01676 Incorporating the Spatial Correlation of Preventive Maintenance into Multi-Year Pavement Maintenance Planning**
[Poster Session](#) with abstract
Feng Xiao, Shunxin Yang, Jianchuan Cheng
Southeast University
- 22-02106 Influence of Pavement Conditions on Cyclists' Perception of Safety and Comfort: A Combined Survey and Eye Tracking Study**
[Lectern Session](#) with [presentation](#)
April Gadsby, Yi-Chang Tsai, Kari Watkins
OST-R/Bureau of Transportation Statistics; Georgia Institute of Technology (Georgia Tech)

- 22-02646 Initial Concept of Autonomously Monitored Pavement Management Systems and Its Potential Benefits**
[Poster Session](#) with abstract
Heeseung Shon, Chung-Suk Cho, Young-Ji Byon, Jinwoo Lee
Korea Institute of Science and Technology; Khalifa University of Science and Technology; Korea Advanced Institute of Science and Technology (KAIST)
- 22-01441 Innovation in National Park Service Paved Road and Parking Area Deferred Maintenance Estimates**
[Lectern Session](#) with abstract
Jonah Chiarenza, Anthony Maloche, Thomas Canick, Michael Green, Mohammed Elias, Thomas Shanley, Jennifer Aponte Rivera, Jeffrey Beal, Peter Wilke, Gary Baker
OST-R/Volpe Center; Federal Highway Administration; U.S. National Park Service
- 22-04366 Integrating Skid Resistance into Pavement Management Process**
[Lectern Session](#) with [presentation](#)
Oscar Daniel Galvis Arce, Md Al-Amin, Shidong Pan, Yang Xu, Zhanmin Zhang
University of Texas, Austin
- 22-01984 International Roughness Index Model for Composite Pavements in the Long-Term Pavement Performance, Wet, Non-Freeze Climate Region: Machine Learning and Regression Approaches**
[Poster Session](#) with [presentation](#)
Rulian Barros, Hakan Yasarer, Salma Sultana
University of Mississippi; University of Wyoming
- 22-01973 Leveraging LiDAR Intensity to Evaluate Roadway Pavement Markings**
[Poster Session](#) with abstract
Justin Mahlberg, Yi-Ting Cheng, Darcy Bullock, Ayman Habib
Purdue University
- 22-01319 Lifecycle Cost Analysis Building Information Modeling Integration for Road Pavement Maintenance**
[Poster Session](#) with abstract
Cristina Oreto, Salvatore Antonio Biancardo, Rosa Veropalumbo, Nunzio Viscione, Francesca Russo, Gianluca Dell'Acqua
University of Naples Federico II
- 22-20303 Maintenance Decision Support System Implementation Plan**
[Poster Session](#) with abstract
Dave Huft
South Dakota Department of Transportation

- 22-02652 Multi-Objective Optimization of Imperfect Pavement Repair Policy: A Reliability-Based Approach**
[Poster Session](#) with [presentation](#)
Saswati Das, Anjan Siddagangaiah
Indian Institute of Technology, Guwahati
- 22-00063 Multi-Objective Optimization for Sustainable Road Network Maintenance Under Traffic Equilibrium**
[Poster Session](#) with abstract
Jinchao Guan, Xu Yang, Lingyun You, Ling Ding, Xiaoyun Cheng
Chang'an University; Huazhong University of Science and Technology
- 22-03739 A Network-Level Management System to Mitigate the Global Warming Impact of Pavements**
[Poster Session](#) with [presentation](#)
Alanna Yu, Devon Friend, Hamed Barkh, Omar Swei
University of British Columbia
- 22-03835 Pavement Maintenance Program at the Network Level: Mixed Integer Programming with Multiple Objectives**
[Poster Session](#) with [presentation](#) and [full paper](#)
Md Al-Amin
University of Texas, Austin
- 22-20032 Pavement Markings: Wet Retroreflectivity Standards**
[Poster Session](#) with abstract
Ethan Peterson
Minnesota Department of Transportation
- 22-02083 Preliminary Development of a Smartphone Application as an Asset to Pavement Management Engineers**
[Poster Session](#) with abstract
Damien Stephens, Mena Souliman; Matthew Vechione, Mukul Shirvaikar, Yi Li,
University of Texas, Tyler
- 2-01292 Prioritizing Roadway Pavement Marking Maintenance Using Connected Vehicle Sensor Data**
[Poster Session](#) with abstract
Justin Mahlberg, Rahul Sakhare, Howell Li, Jijo Mathew, Darcy Bullock, Gopi Surnilla
Purdue University; Ford Motor Company
- 22-01789 Probabilistic Service Life Model of Pavement Marking by Degradation Data**
[Poster Session](#) with [presentation](#)
Laura Mazzoni, Linda Ho, Kamilla Vasconcelos, Liedi Bernucci
University of Sao Paulo; Universidade de Sao Paulo

22-01435 Raised Pavement Markers Assessments Using Mobile Retroreflectivity Unit Technology

[Poster Session](#) with abstract

Alexander Oracheff, Ali Shahin, Charles Holzschuher, James Fletcher,
University of North Florida; University of Florida; Florida Department of Transportation

22-04186 Recurrent Neural Networks for Pavement Performance Forecasting: A Critical Review and Evaluation

[Poster Session](#) with abstract

Micah Mers, Zhongyu Yang, Yung-An Hsieh, Yi-Chang Tsai
Georgia Institute of Technology (Georgia Tech)

22-02785 Road Detection and Maintenance Based on Ground Penetrating Radar: An Object Detection and 3D Reconstruction Approach

[Poster Session](#) with [presentation](#)

Zhen Liu, Lutai Wang, Xingyu Gu, Danyu Wang, Hanyu Deng, Bingyan Cui
Southeast University; University of California, Davis; Rutgers University

22-00585 To Pave or Not to Pave: A Framework for Systematic Decision Making in the Choice of Paving Technologies for Rural Roads

[Poster Session](#) with [presentation](#) and [full paper](#)

Stephen Muzira, Wenxin Qiao
The World Bank

22-03457 Vehicle Exhaust Degradation and Road Performance Evaluation of Polypropylene Fiber and Nano-Titanium Dioxide Compound Modified Micro-Surfacing Materials

[Poster Session](#) with abstract

Dongyu Niu, Kai Liu, Zhao Zhang, Peng Lin, Jiale Guo, Xueyan Liu, Yanhui Niu, Guanyu Liu
Chang'an University; Delft University of Technology

Bridge Management

22-04845 Deep Learning–Based Semantic Segmentation of Point Clouds for As-Built Building Information Modeling Reconstruction of Bridge Components Using Both Real and Synthetic Data

[Lectern Session](#) with abstract

Liu Yang, Yi-Chun Lin, Hubo Cai, Ayman Habib
Purdue University

22-04156 Modeling the Risk of Bridge Strikes by Over-Height Trucks

[Lectern Session](#) with [presentation](#)

John Sobanjo
Florida State University

22-20029 Putting a Dollar Value on Bridge Deck Preservation

[Poster Session](#) with [presentation](#)

Basak Bektas
Minnesota State University, Mankato

22-01082 Random Survival Forest Model for Bridge Deck Deterioration

[Lectern Session](#) with [presentation](#)

Muyang Lu, S. Ilgin Guler

Pennsylvania State University, University Park; Penn State: The Pennsylvania State University

Managing Other Assets

22-04357 Recognition of Roadway Sign at Night Using Thermal Imaging and Computer Vision

[Poster Session](#) with abstract

Long Truong, Edward Clay, Omar Mora, Wen Cheng, Sheng Tan, James Hao

California State Polytechnic University, Pomona; Diamond Bar High School

Bridge Preservation and Rehabilitation

This section includes repair methods, preservation practices and bridge inspection.

Repair Methods

22-00625 Evaluation of a Continuous Laser Ablation Coating Removal Device for Steel Bridges

[Poster Session](#) with abstract

Jason Provines, Stephen Sharp, Raquel Rickard

Virginia Transportation Research Council

22-01939 Evaluation of Maintenance Procedures for Bridge Spalling on Parapet Walls

[Poster Session](#) with [presentation](#)

Richard Miller, Norbert Delatte, Abhijeet Deshpande, Julie Hartell, Sarah Twine, Evan Karunaratne

University of Cincinnati; Oklahoma State University

Preservation Practices

22-03961 Evaluation of Naturally Grown Hydrophobic Coating to Mitigate Water Infiltration into Concrete

[Poster Session](#) with abstract

Xiong Yu, Xijin Zhang, Yusheng(Bear) Jiang, Xudong Fan, Chanjuan Han

Case Western Reserve University

Bridge Inspection

22-20959 Accelerated Bridge Performance Testing

[Lectern Session](#) with [presentation](#)

Robert Zobel,

Federal Highway Administration

22-03862 Analysis of Temperature Dependence in Long-Term Monitoring Data for the West Seattle High-Rise Bridge

[Lectern Session](#) with [presentation](#)

Arezoo Imani, Michael Brown, Greg Banks
WSP

22-02005 Evaluating Arkansas Weathering Steel Bridge Performance

[Poster Session](#) with [presentation](#)

Yessenia Gonzalez, Ernest Heymsfield,
University of Arkansas; University of Arkansas, Fayetteville

22-04551 Forensic Investigation of Atypical Deterioration in Prestressed Concrete Box Beams

[Poster Session](#) with abstract

Harsha Amunugama, Upul Attanayake
Western Michigan University

22-01283 New Aerial System with Intelligent Measurement Integration for Bridge Monitoring

[Poster Session](#) with [presentation](#)

Roya Nasimi, Fernando Moreu, Mitra Nasimi, Richard Wood
University of Nebraska, Lincoln; University of New Mexico

22-20974 Nondestructive Evaluation of Reinforced Concrete Bridge Deck Slabs with Ground Penetrating Radar

[Lectern Session](#) with [presentation](#)

Wael Zatar, Hai Nguyen, Hien Nghiem
Marshall University

22-20969 A State-Based Hidden Markov Model Approach to Impact Echo Signal Classification

[Lectern Session](#) with [presentation](#)

Agnimitra Sengupta
Pennsylvania State University

22-03160 Understanding the Performance of Bridge Decks Through Full-Scale Accelerated Testing

[Lectern Session](#) with abstract

Hoda Azari, Mehdi Rashidi, John Braley, Robert Zobel,
Federal Highway Administration; GENEX Systems; Rutgers University

Culvert and Drainage Systems Maintenance

22-20294 Cost-Effective Methods to Retrofit Culverts Using Glass Fiber-Reinforced Polymer Composites

[Poster Session](#) with abstract

Daniel Murcia, Mahmoud Taha
University of New Mexico

22-20169 Hydraulic Inspection Vehicle Explorer (HIVE 2.0) for Culvert Upgrades

[Poster Session](#) with presentation

Dryver Huston

University of Vermont

Equipment and Facilities

22-04240 Estimating the Levelized Cost of Direct Current Fast Charging of Medium and Heavy Duty Battery Electric Fleets

[Poster Session](#) with abstract

Qiang Dai, Amgad Elgowainy, Thomas Stephens, Yan Zhou

Argonne National Laboratory

22-01314 The Race to Zero-Emission Freight: Lessons Learned from the Deployment of Electric Trucks in the Heavy-Duty Trucking Sector

[Lectern Session](#) with [presentation](#)

Claire Sugihara, Scott Hardman, Kenneth Kurani

University of California, Davis

22-20377 Transitioning to Zero-Emission Solutions for Commercial and Industrial Vehicles

[Lectern Session](#) with abstract

Aravind Kailas

Volvo Group North America

Gravel Road Maintenance

22-00578 Artificial Neural Network Based Roughness Prediction Models for Gravel

[Poster Session](#) with [presentation](#)

Osama Abu Daoud, Khaled Ksaibati

University of Wyoming

22-20582 Wavelet Filter Evaluation for Ride Quality of Unpaved Roads using Smartphones

[Lectern Session](#) with [presentation](#)

Ying Huang

North Dakota State University

Work Zones and Maintenance Worker Safety

22-03066 A Calibration and Validation Methodology for Simulation Models of Intelligent Work Zones

[Poster Session](#) with abstract

Li Zhao, Laurence Rilett, MM Shakiul Haque

University of Nebraska, Lincoln; Auburn University

- 22-03525 Development, Crash Testing, and Evaluation of Portable Concrete Barriers Gap-Spanning Hardware**
[Lectern Session](#) with [presentation](#)
Riley Ruskamp, Mojdeh Asadollahi Pajouh, Robert Bielenberg, Scott Rosenbaugh, Ronald Faller
University of Nebraska, Lincoln
- 22-03877 The Effect of Work Zone Warning Delivery Distances on Connected Vehicles Safety Performance: A Conflation of Microsimulation Modeling and the Hierarchical Negative Binomial**
[Poster Session](#) with abstract
Arash Khoda Bakhshi, Mohamed Ahmed
University of Wyoming
- 22-03345 Evaluation of the Impact of Work Zone Traffic Control Devices on Change in Speed Using the SHRP2 Naturalistic Driving Study**
[Poster Session](#) with [presentation](#)
Shauna Hallmark, Guillermo Basulto-Elias, Nicole Oneyear, Amrita Goswamy, Raju Thapa, Susan Chrysler, Omar Smadi
Iowa State University; University of Central Florida; Louisiana Transportation Research Center; Private contractor
- 22-00247 Evaluation of Orange Pavement Markings for Use in Work Zones**
[Poster Session](#) with abstract
Erin Lammers, William Staats
Kentucky Transportation Cabinet
- 22-03639 Low Cost Connected Work Zone Devices with Simplified Architecture**
[Poster Session](#) with [presentation](#)
Glenn Vorhes, David Noyce
University of Wisconsin-Madison
- 22-03122 Safety Effects of Temporarily Traffic Control Countermeasures on Highway Work Zones**
[Poster Session](#) with [presentation](#)
Fadi Shahin, Wafa Elias, Tomer Toledo
Sami Shamoan College of Engineering; Technion Israel Institute of Technology
- 22-02066 Understanding Patterns of Contributing Factors in Encroachment-Related Work Zone Crashes**
[Poster Session](#) with abstract
Subasish Das, Mahmood Tabesh, Bahar Dadashova, Chiara Dobrovolny
Texas A&M Transportation Institute; Texas A&M University
- 22-03731 Work Zone Crash Occurrence Prediction Based on Planning Stage Work Zone Configurations Using an Artificial Neural Network**
[Poster Session](#) with abstract
Yang Cheng, Keshu Wu, Hanchu Li, Steven Parker, Bin Ran, David Noyce
University of Wisconsin-Madison

Pavement Monitoring and Evaluation

This section includes detecting, evaluating and monitoring pavement distress; and performance management.

Detecting, Evaluating and Monitoring Pavement Distress

22-20575 Agency Perspective on Pavement Condition Evaluation in an Abundant Data Paradigm

[Lectern Session](#)

James Greene

Florida Department of Transportation

22-20574 Artificial Intelligence Applications in Pavement Condition Evaluation: Challenges and Opportunities

[Lectern Session](#)

Yi-Chang Tsai

Georgia Institute of Technology (Georgia Tech)

22-20578 Automated Pavement Crack Detection with Deep Learning Methods

[Lectern Session](#)

Feng Wang

Texas State University, San Marcos

22-20579 Automatic Distress Segmentation on Asphalt Pavement Based on Deep Learning with Multiple Branches

[Lectern Session](#)

Hong Lang

Tongji University

22-03561 Case Studies on Corridor-Level Structural Evaluation of Flexible Pavements Using a Traffic Speed Deflectometer

[Lectern Session](#) with [presentation](#)

Martín Scavone LaSalle, Samer Katicha, Gerardo Flintsch, Brian Diefenderfer

Virginia Polytechnic Institute and State University; Virginia Transportation Research Council

22-20581 Detecting Pavement Distresses Using Crowdsourced Dashcam Imagery Data

[Lectern Session](#)

Mahmood Tabesh

Texas A&M University

22-04388 Development of a Novel Pavement Performance Index for Low-Volume Roads of Newfoundland and Labrador

[Poster Session](#) with [presentation](#) and [full paper](#)

Shajib Guha, Kamal Hossain, Keaton Oates,

Memorial University of Newfoundland; Carleton University

- 22-20586 An Efficient and Explainable Ensemble Learning Model for Asphalt Pavement Condition Prediction Based on Long-Term Pavement Performance Dataset**
[Lectern Session](#)
Jenny Liu
Missouri University of Science and Technology
- 22-20577 Evaluating Crack Identification Performance of 3D Pavement Imaging**
[Lectern Session](#) with presentation
Ryan Salameh
Georgia Institute of Technology (Georgia Tech)
- 22-00858 A Heterogeneous Markov Chain Model to Predict Pavement Performance and Deterioration**
[Poster Session](#) with abstract
Jhenyffer Asp, Gary Davis, Mihai Marasteanu
Minnesota Department of Transportation; University of Minnesota, Twin Cities
- 22-01534 Intelligent Detection of Potholes in Asphalt Pavement Based on Deep Learning**
[Lectern Session](#) with [presentation](#)
Danyu Wang, Xingyu Gu, Jia Liang, Zhen Liu, Yizheng Chen, Lutai Wang
Southeast University
- 22-20587 Novel Multi-Stage Generative Adversarial Networks Framework for Pavement Cracks Image Generation**
[Lectern Session](#)
Tao Ma
Southeast University
- 22-20580 Object Classification in Asphalt Pavement Using Generative Model Based on Deep Learning**
[Lectern Session](#)
Xingyu Gu
Southeast University
- 22-20588 Road Subsurface Distress Recognition Method Using Multi-attribute Feature Fusion of Ground Penetrating Radar**
[Lectern Session](#)
Yuchuan Du
Tongji University
- 22-02504 Simplified Analysis Technique of Flexible Pavements Using Traffic Speed Deflectometer and Falling Weight Deflectometer Data at the Network Level**
[Lectern Session](#) with [presentation](#)
Abu Sufian, Emad Kassem
University of Idaho

22-02185 A Spatial-Temporal Optimization Model for Road Network Maintenance Under Deterioration Uncertainty

[Poster Session](#) with abstract

Jinchao Guan, Yi Li

Chang'an University

22-20576 A Standardized Cracking Annotation Method for Pavement Images

[Lectern Session](#) with [presentation](#)

Zhongyu Yang

Georgia Institute of Technology (Georgia Tech)

22-03743 Ten Years of Traffic Speed Deflectometer Research in the United States: A Review

[Lectern Session](#) with [presentation](#)

Samer Katicha, Gerardo Flintsch, Brian Diefenderfer

Virginia Polytechnic Institute and State University; Virginia Transportation Research Council

22-01373 A Transfer Learning Approach to Road Roughness Assessment Using Calibration-Free Vehicle Dynamic Response

[Poster Session](#) with abstract

Zhao Du, Asmus Skar, Xingyi Zhu, Yinghong Fan, Wenrong Zhang

Tongji University; Danmarks Tekniske Universitet

22-02936 Viscoelastic Parameter Identification of Asphalt Pavements Based on Traffic Speed Deflectometer Measurements

[Lectern Session](#) with [presentation](#)

Zhaojie Sun, Cor Kasbergen, Karel van Dalen, Kumar Anupam, Athanasios Skarpas, Sandra Erkens

Technische Universiteit Delft; Delft University of Technology; Khalifa University

Performance Management

22-00050 Integration of Pavement Roughness into Safety Performance

[Lectern Session](#) with abstract

Xuting Wang, Vikash Gayah, S. Ilgin Guler

Penn State: The Pennsylvania State University; Pennsylvania State University, University Park

22-00831 Missing Pavement Performance Data Imputation Using Graph Neural Networks

[Poster Session](#) with [presentation](#)

Lu Gao, Ke Yu, Pan Lu

University of Houston; University of Pittsburgh; North Dakota State University

Pavement Repair and Rehabilitation Methods

This section includes papers on crack sealing; and chip seals, slurry seals and surface treatments.

Crack Sealing

22-00609 Feasibility of Three-Dimensional Printing to Fill In Situ Cracks in Asphalt Concretes

[Lectern Session](#) with [presentation](#)

Frank Awuah, Alvaro Hernandez, Bahman Ghiassi, Yuanyuan Li, Mehran Torbaghan, Richard Jackson, Mark Miodownik
University of Nottingham

22-03708 Mechanistic Empirical Model for Cracking Prediction in Unbonded Concrete Overlays on Concrete Pavements

[Lectern Session](#) with abstract

Lev Khazanovich, Julie Vandebossche, Lucio De Salles, Thomas Burnham
University of Pittsburgh, Minnesota Department of Transportation

22-04909 Modeling the Effects of Asphalt Overlay Design on Pavement Distress Initiation with Random Parameters Hazard-Based Duration Models

[Poster Session](#) with [presentation](#)

Chunfu Xin, Qing Lu, Hong Zhang
Inner Mongolia University; University of South Florida

22-01080 Surface Characteristic and Internal Composition Evolution of Asphaltic Crack Repair Material Under Ultraviolet Irradiation

[Poster Session](#) with abstract

Chen Yang, Zejiao Dong, Liping Cao, Tao Zhou
Harbin Institute of Technology

Chip Seals, Slurry Seals and Surface Treatments

22-03421 Assessment of Performance and Maintenance Needs for an Asphalt Overlaid Continuously Reinforced Concrete Pavement Composite Pavement

[Lectern Session](#) with [presentation](#)

M. Shabbir Hossain, Harikrishnan Nair, H Ozyildirim,
Virginia Department of Transportation; Virginia Transportation Research Council

22-03670 Comprehensive Framework and Roadmap for Lifecycle Safety Management of High Friction Surface Treatments

[Lectern Session](#) with [presentation](#)

Cibi Pranav, Yi-Chang Tsai
Georgia Institute of Technology

22-20321 Considering the Thermal Compatibility of High Friction Surface Treatment and the Relationship with Pavement Condition

[Lectern Session](#) with abstract

Gregg Freeman
Kwik Bond Polymers LLC

- 22-04027 Development of Predictive Models for Friction Characteristics of High-Friction Surface Treatment Aggregates**
[Poster Session](#) with abstract
Ahmed El-Ashwah, Korrenn Broaddus, Magdy Abdelrahman
Missouri University of Science and Technology
- 22-02400 Developing Network Slurry Seal Performance Models Using Pavement Management System Data**
[Poster Session](#) with [presentation](#)
Dingxin Cheng, Roger Smith, Sui Tan, Mario Jaquiz, Carlos Chang,
California State University, Chico; Texas A&M University, College Station; Metropolitan Transportation Commission (MTC); Florida International University
- 22-01967 Effect of Mill and Thin Overlays on Roughness for Pavements in Cold Climate Locations**
[Lectern Session](#) with abstract
Adriana Vargas-Nordbeck, Anthony Brenes-Calderón
National Center for Asphalt Technology; Auburn University
- 22-02945 Evaluation of Different Surface Treatments to Extend Pavement Life**
[Lectern Session](#) with [presentation](#)
Harikrishnan Nair, Kevin McGhee
Virginia Transportation Research Council
- 22-00407 Evaluation of Pavement Treatment Strategies for Friction-Deficient Horizontal Curves**
[Lectern Session](#) with abstract
Jia Peng, Longjia Chu, Yuanyuan Liu, T. F. Fwa
Chang'an University
- 22-00033 Experimental Study of the Effects of Moisture on the Behavior of Concrete Pavement Joint Sealants**
[Poster Session](#) with abstract
Jinho Kim, Dan Zollinger, Woohyun Cho
Texas A&M Transportation Institute; Texas A&M University, College Station
- 22-20323 Federal Highway Administration Update on High Friction Surface Treatment and Continuous Pavement Friction Measurement**
[Lectern Session](#) with [presentation](#)
Joseph Cheung
Federal Highway Administration
- 22-20322 High Friction Surface Treatments: Wisconsin Department of Transportation Experience**
[Lectern Session](#) with [presentation](#)
Myungook Kang
Wisconsin Department of Transportation

22-02203 Impact of Silane Penetrating Sealant on Thin Epoxy Overlays Performance

[Poster session](#) with abstract

Abul Mazumder, Upul Attanayake

Indiana Department of Transportation; Western Michigan University

22-03980 Laboratory-Based Performance Assessment of Otta Seal for Low-Volume Roads

[Poster Session](#) with [presentation](#)

Md Jibon, Bo Yang, Masrur Mahedi, Halil Ceylan, Sunghwan Kim

Iowa State University

22-02812 Optimizing the Cost-Effectiveness and Time of Application of Ultra Thin Asphalt Overlay in Hot and Humid Climates

[Poster Session](#) with abstract

Ibrahim Elnaml, Momen Mousa, Marwa Hassan

Louisiana State University

22-03032 Survival Analysis to Determine the Factors Affecting the Optimum Timing to Apply Chip Seal

[Poster Session](#) with abstract

Sk Abu Talha, Munir Nazzal, Dmitry Manasreh, Md Tareq Khan

University of Cincinnati

22-20320 Update to the Federal Highway Administration's High Friction Surface Treatments Site Selection and Installation Guide

[Lectern Session](#) with [presentation](#)

David Merritt

The Transtec Group, Inc.

Roadside Maintenance

22-04759 Application of Autonomous Vehicles for Automated Roadside Safety Assessment

[Lectern Session](#) with [presentation](#)

Dmitry Mohammad Manasreh, Munir Nazzal

University of Cincinnati

22-20522 Connecting Solar Farms, Erosion Areas, and Burn Scar issues with Pollinator Habitat

[Lectern Session](#) with abstract

Kris Gade, Jack Broadbent, Ken Murray, Matthew Quirey, Christopher Pincetich, Jennifer Osmondson,

Arizona Department of Transportation; California Department of Transportation; The Ray

22-20520 Emerging Trends: Pollinators in the Right-of-Way

[Poster Session](#) with abstract

Christa Schaefer, Kris Gade

Wisconsin Department of Transportation; Arizona Department of Transportation

- 22-20034 Enhancing Existing Isolated Underpasses with Fencing Reduces Wildlife Crashes and Connects Habitat**
[Poster Session](#) with abstract
Bridget Donaldson
Virginia Transportation Research Council
- 22-00799 Greening Roadway Infrastructure with Vetiver Grass to Support Transportation Resilience**
[Poster Session](#) with abstract
Karl Kim, Sequoia Riley, Elizabeth Fischer, Sadik Khan,
University of Hawaii; University of Hawai'i, Manoa; State of Hawaii; Jackson State University
- 22-02264 Parameterizing Pollutant Dispersion Downwind of Roadside Vegetation Barriers**
[Poster Session](#) with abstract
Khaled Hashad, Jonathan Steffens, Richard Baldauf, Parikshit Deshmukh, K. Max Zhang
Cornell University; Lafayette College; U.S. Environmental Protection Agency (EPA); Jacobs Technology Inc
- 22-20519 Roadside Maintenance Operations, Research Projects, Challenges, and Partners**
[Poster Session](#) with abstract
Scott Lucas
Ohio Department of Transportation
- 22-20010 Testing Wildlife Friendly Fencing Modifications to Manage Wildlife and Livestock Movements**
[Poster Session](#) with abstract
Chad DeAustin
Montana Department of Transportation
- 22-20521 Visualizing Roadside as National Transportation Assets**
[Poster Session](#) with abstract
Raymond Willard
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