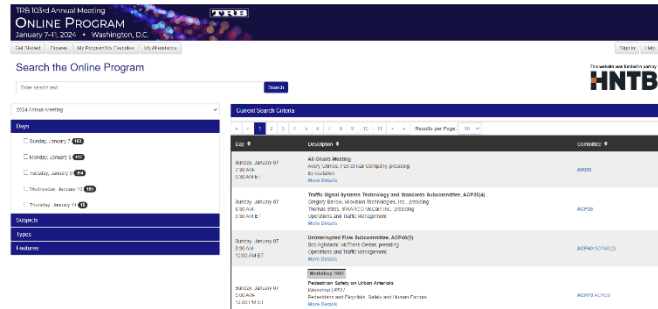




# Winter Maintenance at the 2025 TRB Annual Meeting

## Resource Spotlight: TRB 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 program includes papers, posters and presentation materials from the 2025 Annual Meeting as well as the previous three meetings.



Below we've compiled selected links to the posters, presentations and papers related to winter maintenance presented at the 2025 Annual Meeting. **Registration, attendance and access to materials are 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.

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## Equipment and Facilities

### **25-06232 Development of a Salt Spreader Controller Program Using Machine-Sensed Roadway Weather Parameters**

[Lectern Session](#)

Vaishnavi Avhad, Bryan Remache-Patino, Chengbo Ai, Russell Tessier, Mark Goldstein  
*University of Massachusetts, Amherst; Massachusetts Department of Transportation*

### **25-20200 Snowplow Driver Assist System**

[Poster Session](#)

Brian Davis  
*University of Minnesota*

## Materials

### **25-03129 Development of Hydrophobic Asphalt Emulsion for Asphalt Roads in Subzero Temperature Regions**

[Poster Session](#)

Shuja Ali, Prabin Ashish, Ramkrishna Sarkar, Xing Cai, Anand Sreeram, Anoop Raut  
*Indian Institute of Technology, Kanpur; Southeast University; University of Nottingham*

### **25-03037 Evaluating Alternative Deicers: An Investigation on the Impact on Frictional Characteristics of Asphalt Pavement**

[Lectern Session](#)

Mitchell Lawlor, Kamal Hossain, Jennifer Drake  
*Carleton University*

## Infrastructure, Pavements and Bridges

### **25-06258 Analyzing Intersection Traffic Characteristics Under Different Weather Conditions Using On-the-Go Drone Data**

[Poster Session](#)

Yanqiang Wang, Yuan Zhu, Xuanming Li, Junqing Wang, Yiming Pan, Hong Yang  
*Inner Mongolia University; Old Dominion University*

### **25-02019 Bridge Condition Forecasting via Temporal Graph Convolution Networks and Non-Destructive Evaluation**

[Lectern Session](#)

Mozhgan Momtaz, Hoda Azari  
*Federal Highway Administration (FHWA)*

### **25-04300 Crash Modification Factors and Functions for Management of Pavement Friction for Safety for Roadway Segments**

[Poster Session](#)

Ross McCarthy, Gerardo Flintsch, Edgar de León Izeppi, Bhagwant Persaud, Samer Katicha, Alejandra Medina-Flintsch  
*Virginia Polytechnic Institute and State University; Toronto Metropolitan University*

**25-02426 A Data-Driven Approach to Identify Candidate Bridge Decks for Winter Weather Warning System Deployments**

[Lectern Session](#)

Jonathan Kay, Timothy Gates  
*Michigan State University*

**25-04767 Determination of Hierarchy of Input Parameters for Service Life Modeling of Concrete Structures Against Chloride-Induced Corrosion**

[Lectern Session](#)

Zafrul Khan, Ahmad Alhasan, Rodrigo Antunes  
*Applied Research Associates, Inc.; City of Gainesville (FL)*

**25-00082 Driver Response to Winter Weather Warning Messages on Changeable Message Signs at Freeway Bridges**

[Poster Session](#)

Sagar Keshari, Sakar Pahari, Magdalena Cavka, Vahid Bahrami, John Racine, Timothy Gates, Peter Savolainen  
*Michigan State University*

**25-03060 Impact of Concrete Sealer and Salt Usage on Concrete Bridge Deck Rating in Wisconsin**

[Lectern Session](#)

Hao Wang, Danny Xiao, Xiao chen  
*Rutgers University; University of Wisconsin, Platteville*

**25-00029 A Study on Frost-Induced Black Ice Prediction and Contributing Atmospheric Factors Using Explainable Machine Learning Models: A Focus on Random Forest and XGBoost**

[Lectern Session](#)

Jinhwan Jang  
*Korea Institute of Civil Engineering and Building Technology (KICT)*

## Technology and Information Systems

**25-01405 Advancing Winter Road Maintenance: An AI-Driven Web Platform for Real-Time Road Condition Monitoring and Spatial Analysis**

[Lectern Session](#)

Michael Urbiztondo, Mingjian Wu, Tae Kwon  
*University of Alberta*

**25-20268 Aurora: Connected Vehicle Friction**

[Lectern Session](#)

Björn Zachrisson  
*NIRA Dynamics AB*

**25-05647 Automating Work Orders and Tracking Winter Snow Plows and Patrol Vehicles with Telematics Data**

[Poster Session](#)

Anugunj Naman, Aaron Ault, Yaguang Zhang, James Krogmeier  
*Purdue University*

**25-05258 A Comparative Analysis of Transformer and Traditional Machine Learning Models for Road Surface Temperature Prediction**

[Lectern Session](#)

Mohammad Hossein Tavakoli Dastjerdi, Zhen Liu, Muchun Liu  
*University of Virginia*

**25-06232 Development of a Salt Spreader Controller Program Using Machine-Sensed Roadway Weather Parameters**

[Lectern Session](#)

Vaishnavi Avhad, Bryan Remache-Patino, Chengbo Ai, Russell Tessier, Mark Goldstein  
*University of Massachusetts, Amherst; Massachusetts Department of Transportation*

**25-01468 Integrating Convolutional Neural Networks and Explainable AI for Enhanced Winter Road Surface Conditions Classifications Using Stationary Road Weather Information System Imagery**

[Lectern Session](#)

Yong Wook Lee, Mingjian Wu, Tae Kwon  
*University of Alberta*

**25-00980 Leveraging the Integration of Connected Vehicle and Road Weather Information System Technology**

[Poster Session](#)

Adnan Inusah, Inya Nlenanya, Shauna Hallmark  
*Iowa State University*

**25-00604 MSTL-Net: A Novel Approach of Road Visibility Estimation Based on Time-Series Images and Meteorological Data**

[Poster Session](#)

Tianxiang Bu, Tianhao Ma, Junqing Zhu, Tao Ma  
*Southeast University*

**25-03901 Novel Method for Optimizing Dual-Type Road Weather Information System Networks: A Case Study of Maine in the United States**

[Poster Session](#)

Simita Biswas, Tae Kwon  
*University of Alberta*

**25-04730 Predicting Winter Road Surface Condition from High-Resolution, Connected Vehicle Data: An AI Approach**

[Poster Session](#)

Yunpeng Shi, Wen Zhang, Chunming Qiao, Adel Sadek  
*Mott MacDonald, LLC; University at Buffalo, SUNY*

**25-01544 Prediction of Roadway Friction for Winter Maintenance Using Machine Learning Models**

[Poster Session](#)

Jingnan Zhao, Hao Wang, Laura Fay

*Rutgers University; Western Transportation Institute (WTI)*

**25-03152 Sample-Efficient Collaborative Accurate Snow Removal for LiDAR Point Clouds Without Labels: A Federated Meta-Unsupervised Learning with Omni-Dimensional Dynamic Convolution**

[Poster Session](#)

ZongWen Gu, Zhizhou Wu, Yunyi Liang,  
*Xinjiang University; Tongji University*

**25-05987 Semi-Supervised Variational Model Ensembling Method for Snow Removal with Prior Information and Uncertainty Consistency**

[Poster Session](#)

Jizhao Wang, Hang Zhao, Zhizhou Wu, ZongWen Gu, Wenxin Jiang, Yunyi Liang  
*Xinjiang University; Tongji University*

**25-05217 Vehicle Trajectory Tracking on Snowy Roads: A Model Predictive Control Method**

[Poster Session](#)

Jinbiao Huo, Zhaohui Liang, Haotian Shi, Ke Ma, Xiaopeng Li, Zhiyuan Liu  
*University of Wisconsin, Madison; Southeast University*

## Performance Management

**25-01207 Accurate and Simple Prediction of Ice Melting Capacity in Chloride Deicer Brine Blends**

[Lectern Session](#)

Scott Koefod  
*Cargill Salt Group*

**25-05396 Analyzing Public Satisfaction with Winter Road Maintenance and Snow Clearance Across Demographic Groups and Geographies in Utah**

[Poster Session](#)

Shailendra Khanal, Patrick Singleton  
*Utah State University*

**25-05282 Developing Digital Twin for Disaster Management Under Snowstorm in Winter**

[Poster Session](#)

Yasuhiro Nagata, Toru Hagiwara, Sho Takahashi, Masahiro Yagi, Yasuhiro Kaneda, Genki Ooi  
*Hokkaido University; Hokkaido Development Engineering Center*

**25-03812 Exploring the Correlation Between Winter Severity Indices and Winter Maintenance Costs: Insights and Comparative Analysis from Nationwide Practices**

[Lectern Session](#)

Ardeshir Fadaei, Farish Jazlan, Amirali Soltanpour, Hamid Mozafari, Ali Zockaie, Mehrnaz Ghamami, James Roath,  
*Michigan State University; Michigan Department of Transportation*