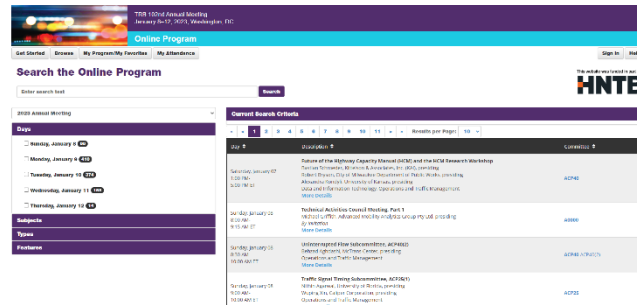# Winter Maintenance at the 2023 TRB Annual Meeting

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 2023 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 2023 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.

Contents

Equipment and Facilities

23-03739 New Countermeasures to Mitigate Blowing Snow at Apertural Areas in Snow Fences
Lectern Session with presentation and full paper
Kuniyasu Sugawara, Toshimitsu Sakurai, Hiroki Matsushita, Tetsuro Matsushima, Akihiro Yoshii, Atsushi Nishimura, Sadami Ono
Civil Engineering Research Institute for Cold Region; Hokkaido Regional Development Bureau

23-00081 Night Icing Prediction Using Vehicle-Mounted Pavement Temperature Sensor and Atmospheric Data
Lectern Session with presentation
Jinhwan Jang
Korea Institute of Civil Engineering and Building Technology (KICT)

23-20079 Region1: New Hampshire Department of Transportation's Snowplow Lights: LED Versus Halogen (New Hampshire DOT)
Poster Session with presentation
Deirdre Nash
New Hampshire Department of Transportation

Materials

23-20392 The Environmental Impacts of the Use of Potassium Acetate as an Alternative Deicer
Lectern Session
Chan Lan Chun
University of Minnesota, Duluth

23-01929 Salt Stockpile Inventory Management Using LiDAR Volumetric Measurements
Poster Session with abstract
Justin Mahlberg, Raja Manish, Yerassyl Koshan, Mina Joseph, Jidong Liu, Timothy Wells, Jeremy McGuffey, Ayman Habib, Darcy Bullock
Purdue University; Indiana Department of Transportation

23-01983 Time-Dependent Release of Salts from Asphalt Pavement Containing Anti-Icer Additives
Lectern Session with presentation and full paper
Robert Koefod
Cargill Salt Group

Infrastructure, Pavements and Structures

23-00682 Operational Response of a Novel External Hydronic Heating Systems with Insulated Pipe Loop for Bridge Deck Deicing During a Record Snowstorm in Texas
Lectern Session with presentation
Omid Habibzadeh-Bigdarvish, Gang Lei, Hussein Sanjani, Anand Puppala, Xinbao Yu
University of Texas, Arlington; Texas A&M University, College Station

Technology, Information Systems and Performance Management

23-02089 Arrangements of Secondary Snow Fences as Countermeasures Against the End Effect Based on 3D Numerical Simulation
Poster Session with presentation and full paper
Toshimitsu Sakurai, Kuniyasu Sugawara, Hiroki Matsushita, Tetsuro Matsushima, Atsushi Nishimura, Sadami Ono
Civil Engineering Research Institute for Cold Region; Hokkaido Regional Development Bureau

23-20151 Brooms, Blades, and Ice Breakers: Alternative Mechanical Snow Removal Innovations
Lectern Session with abstract
Laura Fay, Karalyn Clouser
Western Transportation Institute (WTI)

23-01921 Calibration and Confidence in Snowplow Fleet Operations and Fleet Telematics
Lectern Session with presentation
Justin Mahlberg, Jairaj Desai, Howell Li, Rahul Sakhare, Timothy Wells, Darcy Bullock
Purdue University; Indiana Department of Transportation

23-01079 Evaluation of Bridge Deck Winter Weather Warning Systems
Lectern Session with presentation
Sagar Keshari, Md Shakir Mahmud, Sakar Pahari, Myles Overall, Dario Babic, Timothy Gates, Peter Savolainen
Michigan State University; University of Zagreb; VMB

23-00001 Evaluation of Crowdsourced Data on Unplowed Roads
Lectern Session with presentation
Noah Goodall
Virginia Department of Transportation

23-03293 Forecasting the Cost of Winter Maintenance: The Relationships Between Winter Severity, Pavement Quality, and the Cost of Roadway Snow and Ice Control
Lectern Session with presentation
James Sullivan, Mitchell Robinson, Jonathan Dowds
University of Vermont

23-00232 How to Incorporate Weather Data in Simulations of Winter Road Maintenance
Poster Session with presentation and full paper
Nafiseh Mohammadi, Alex Klein-Paste
Norwegian University of Science and Technology (NTNU)

23-04929 Improve Winter Maintenance via Deep Learning, Data Scraping, and Autonomous Decision Making
Poster Session with presentation
Mohammad Hossein Tavakoli Dastjerdi, Zhen (Leo) Liu, Behnam Azmoon, Xiaoyong (Brian) Yuan
Michigan Tech: Michigan Technological University

23-04393 Safety Impacts of Road Weather Information System Implementation in Alaska
Lectern Session with presentation
Mohamed Mohamed, Nathan Belz
Louisiana State University; University of Alaska, Fairbanks

23-00963 Spatial Analysis of Snowplow Truck Crash Hot Spots in the Mountainous Road Networks
Poster Session with presentation
Imran Reza, Muhammad Tahmidul Haq, Khaled Ksaibati
University of Wyoming

Weather and Road Conditions

23-03017 Assessment of Road Surface Conditions in Winter Using Connected Vehicles
Poster Session with abstract
Andres Rosales-Castellanos, Yuwei Bie, Tony Qiu
University of Alberta

23-02666 Investigation of Relationship Between Weather Conditions and Visibility Conditions on the Road in Winter
Lectern Session with presentation
Yuki Nakamura, Toru Hagiwara, Yasuhiro Nagata, Sho Takahashi, Ryoichi Tsurumaki, Naoki Matsuoka
Hokkaido University; Hokkaido Development Engineering Center; Hokkaido Weather Technology Center

23-03878 Real-Time Detection of Blowing Snow on Rural Mountainous Freeway Using Convolutional Neural Networks
Poster Session with abstract
Ahmed Mohamed, Mohamed Ahmed, Md Nasim Khan
University of Cincinnati; Texas State University

23-01059 Road Friction Estimations Using Multi-Source Road Weather Data
Lectern Session with abstract
Xueru Ding, Tae J. Kwon
University of Alberta

23-01324 Roadway Snow Estimation Using Dual-Spectrum Camera Images and Computer Vision
Poster Session with abstract
Xiangdong He, Yuning Wu, Keping Zhang, Xuan Zhu, Xianfeng Yang
University of Utah; University of Maryland, College Park

23-00564 Winter Road Surface Conditions Recognition Using Semantic Segmentation and Generative Adversarial Network: A Case Study of Iowa
Lectern Session with presentation
Mingjian Wu, Tae J. Kwon, Nancy Huynh
University of Alberta