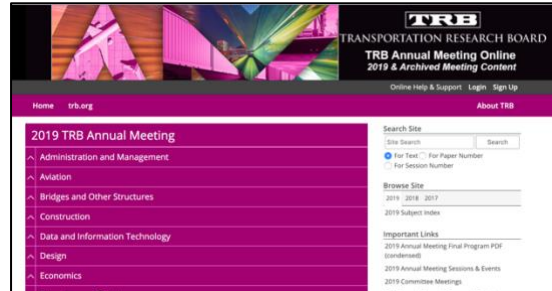




Winter Maintenance at the 2019 TRB Annual Meeting

Resource Spotlight: TRB Annual Meeting Online Portal

If you're searching for the latest research on a transportation topic, don't forget to visit the [TRB Annual Meeting Online](#) portal. The portal includes papers, posters and presentation materials from the 2017-2019 Annual Meetings.



Below we've compiled links to the papers related to winter maintenance that were presented at the 2019 Annual Meeting. Papers are free to download 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.

Equipment and Facilities

19-00255 [Sensor-Based Spreader Automation for Reducing Salt Use and Improving Safety](#)
Ayushmaan Aggarwall, Niharika Bhattacharjee, Aadi Bhattacharya, Raka Bose, Anshul Gupta, Deepta Gupta, Anuj Kapoor, Elina Rani
IBM Thomas J Watson Research Center; students

19-01231 [Maintenance Facility Location Optimization Review](#)
William Holik
Texas A&M Transportation Institute

Materials

19-03679 [Determining the True Cost of Making Brine and Comparing Liquid Deicers](#)
Mallory Crow, William Schneider, Scott Lucas, Frank Phillips
Ohio DOT; University of Akron

19-02042 [Field Evaluation of Different Pre-wetting Ratios for Sustainable Salting](#)
Jaspreet Kaur, Taimur Usman, Liping Fu
WSP Canada; University of Waterloo

19-03630 [Side-By-Side Field Comparison of Snow and Ice Control Chemicals for Anti-Icing Applications](#)
Ken Rainwater, William D Lawson, James G Surles, Felipe J. Estrada, W. Andrew Jackson
Texas Tech University

19-00489 [Assessment of Potassium Succinate \(KSu\) as an Alternative Roadway Deicer](#)

Laura Fay, Michelle Akin

Western Transportation Institute, Washington State University

19-02757 [Impact of Deicing and Anti-Icing Materials on Concrete Pavement Durability Using Field Performance Data](#)

Danny Xiao, Sam Owusu-Ababio, Robert Schmitt

University of Wisconsin, Platteville

19-00174 [The Influence of Aqueous Solution on Compacted Snow: A Field Investigation](#)

Henri Giudici, Alex Klein-Paste, Johan Wåhlin

Norwegian University of Science and Technology (NTNU); Statens vegvesen

Pavements and Bridges

19-01985 [Friction and Snow–Pavement Bond After Salting and Plowing Permeable Friction Surfaces](#)

Michelle Akin, Laura Fay, Xianming Shi

Western Transportation Institute, Washington State University

19-04400 [Development of Advanced Anti-icing Spray System Using Automated Road Surface Condition Judgement System](#)

Tomonori Ohiro, Kiyoshi Takakura, Takuya Sakuraba, Yasushi Hanatsuka, Toru Hagiwara

Nexco Engineering Hokkaido, Japan; Nexco-Maintenance Hokkaido Co., Ltd.; East Nippon Expressway Co., Ltd.; Bridgestone Corp., Japan; Hokkaido University

19-01523 [Research on Comprehensive Effects of Physics and Chemistry on Micro Surface Technology of Anticoagulant Ice](#)

Tianqing Ling, Xin Li, Yijia Xu

Chongqing Jiaotong University

19-02535 [Effect of Electrode Geometry and Size on Heating Performance of Electrically Conductive Concrete](#)

Amir Malakooti, Hesham Abdualla, Alireza Sassani, Halil Ceylan, Sunghwan Kim

Iowa State University; Applied Research Associates, Inc. (ARA)

Safety, Traffic and Connected Vehicles

19-03084 [Winter Weather Maintenance Operations and Traffic Safety Implications](#)

Luning Zhang, Bryce Hallmark, Jing Dong

Iowa State University

19-02984 [Behavioral Analysis of Drivers Following Winter Maintenance Trucks Enabled With Collision Avoidance System](#)

Rajat Verma, Ramin Saedi, Ali Zockaie, Timothy Gates

Michigan State University

19-03303 [Multimodal Connected Vehicle Technology for Improved Winter Travel](#)

Yaqin He, Michelle Akin, Xianming Shi

Wuhan University of Technology; Washington State University

19-02218 [Analysis and Real-Time Implementation of Variable Advisory Speed Limit Messaging During Winter Storms](#)

Shefang Wang, Anuj Sharma, Skylar Knickerbocker, Neal Hawkins

Iowa State University

19-03285 [Modeling the Effects of Lake-Effect Snow Related Weather Conditions on Daily Traffic Crashes: A Time Series Count Data Approach](#)

Bandhan Dutta Ayon, Benjamin Ofori-Amoah, Lei Meng, Jun-Seok Oh, Kathleen Baker

Western Michigan University

19-00374 [Identification and Classification of Slippery Winter Road Conditions Using Commonly Available Vehicle Variables](#)

Moksheeth Padarthy, Emiliano Heyns

HAN University of Applied Sciences; Vrije Universiteit Amsterdam

19-02137 [Leveraging Connected Vehicles to Provide Enhanced Roadway Condition Information](#)

Howell Li, Joerg Christian Wolf, Jijo K Mathew, Nitin Navali, Steven Zehr, Brandon Hardin, Darcy Bullock

Purdue University; Volkswagen Group of America; Indian Institute of Technology Madras

Snow Fences

19-05707 [Quantifying the Safety Effectiveness of Snow Fence Implementations Based on Crash Severity and Snow Fence Type Utilizing Contemporary Statistical Analysis Methods](#)

Rachael Larson, Thomas Peel, Mohamed Ahmed, Sherif Gaweesh

University of Wyoming

19-04375 [Wind Speed and Blowing Snow Measurement Behind the Living Snow Fence in Northern Hokkaido, Japan](#)

Toshimitsu Sakurai, Yasuhiko Ito, Wataru Takahashi, Joji Takahashi, Atsushi Nishimura, Masaru Matsuzawa

Civil Engineering Research Institute for Cold Region; Hokkaido Regional Development Bureau

Technology and Information Systems

19-00105 [Safety Assessment of the Integration of Road Weather Information Systems \(RWISs\) and Variable Message Signs \(VMSs\) in British Columbia](#)

Mohamed El Esawey, Simon Walker, Caitlin Sowers, Joy Sengupta

British Columbia Ministry of Transportation and Infrastructure

19-04928 [Use of Topography, Weather Zones, & Semivariogram Parameters to Optimize RWIS Station Density Across Large Spatial Scales](#)

Simita Biswas, Mingjian Wu, Stephanie J. Melles, Tae Kwon
University of Alberta; Ryerson University

19-00551 [Determining the Spatiotemporal Coverage of Road Weather Information Systems – A Case Study in Alberta, Canada](#)

Xu Wang, Lian Gu, Tae Kwon, Tony Qiu
University of Alberta; Shandong University

19-02068 [Testing Unmanned Aircraft for Roadside Snow Avalanche Monitoring](#)

Edward McCormack, Torgeir Vaa
University of Washington; Norwegian Public Roads Administration