September 15 – 18, 2019
Hilton Garden Inn Kalispell, Montana

Sponsored by
Transportation Research Board

Co-Sponsored by
Forest Service, U.S. Department of Agriculture

Organized by
Standing Committee on Low-Volume Roads (AFB30)
Conference Subcommittee for the 12th International Conference on Low-Volume Roads (AFB30(1))

Local Host
Western Transportation Institute (WTI) at Montana State University (MSU)
# 12th TRB International Conference on Low Volume Roads

## Low Volume Roads Conference Planning Committee (AFB30(1))

<table>
<thead>
<tr>
<th>Chair</th>
<th>Maureen Kessler</th>
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<td>Shawna Ballay</td>
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<td>Ricky Mitchell</td>
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<td>Gary Danczyk</td>
<td>David Orr</td>
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<td>Laura Fay</td>
<td>Asif Faiz, Emeritus Member</td>
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<td>Vanessa Goetz</td>
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## Standing Committee on Low-Volume Roads (AFB30)

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<thead>
<tr>
<th>Chair</th>
<th>Edward Hoppe</th>
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<tr>
<td>Vanessa Goetz, Committee Research Coordinator</td>
<td>David Johnson</td>
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<td>Shawna Ballay</td>
<td>Maureen Kestler</td>
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<td>Ambarish Banerjee</td>
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<td>Victoria Beale</td>
<td>Khaled Ksaibati</td>
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<td>Kaye Bieniek</td>
<td>Ashok Kumar</td>
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<td>Alondra Chamorro</td>
<td>Hesham Mahgoub</td>
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<td>Bhaskar Chittoori</td>
<td>Heather Miller</td>
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<td>Light Chobya</td>
<td>Ricky Mitchell</td>
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<td>Gianluca Dell’Acqua</td>
<td>Victoria Peters</td>
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<td>Sunanda Dissanayake</td>
<td>Francesca Russo</td>
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<td>Laura Fay</td>
<td>Chett Siefring</td>
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<td>Eric Frempong, PE</td>
<td>Elizabeth Toman</td>
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<td>Lyan Garcia</td>
<td>Ronald Eck, Emeritus Member</td>
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<td>Asif Faiz, Emeritus Member</td>
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<td>Alex Visser, Emeritus Member</td>
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## Transportation Research Board Staff

- Ann Brach, Director, Technical Activities
- Nancy Whiting, Senior Program Officer
- Joanic L. Johnson, Associate Program Officer
- Ashley Vaughan, Associate Program Officer
- Bruce Millar, Deputy Director, TRB Meetings Department
- Kate Debelack, Meeting Assistant

The **Transportation Research Board** is one of seven major programs of the National Academies of Sciences, Engineering, and Medicine. The mission of the Transportation Research Board is to increase the benefits that transportation contributes to society by providing leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board’s varied committees, task forces, and panels annually engage about 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest. The program is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation.

[www.TRB.org](http://www.TRB.org)
<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td><strong>Sunday, September 15, 2019</strong></td>
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<tr>
<td>8:00 a.m. – 5:30 p.m.</td>
<td>Registration</td>
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<tr>
<td>9:00 a.m. – 12:00 p.m.</td>
<td><strong>Session 1: Morning Workshops</strong></td>
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<tr>
<td></td>
<td>- Converting Distressed Paved Roads to Engineered Unpaved Roads</td>
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<td>- Timber Bridge Load Rating Using Load and Resistance Factor Rating (LRFR)</td>
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<td>- Steps for Making Low Volume Roads More Climate Resilient</td>
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<tr>
<td>12:00 p.m. – 1:00 p.m.</td>
<td>Lunch <em>(on your own)</em></td>
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<tr>
<td>1:00 p.m. – 4:00 p.m.</td>
<td><strong>Session 2: Afternoon Workshops</strong></td>
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<td></td>
<td>- Unstable Slope Management Program (USMP) for Low Volume Roads <em>(tickets required)</em></td>
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<td>- Unmanned Aerial Vehicles (UAVs) in Low Volume Road Management</td>
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<td>- Low-Cost Safety Improvements for Low Volume Roads</td>
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<tr>
<td>5:30 p.m. – 7:00 p.m.</td>
<td><strong>Exhibits Open and Welcome Reception</strong></td>
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<tr>
<td><strong>Monday, September 16, 2019</strong></td>
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<tr>
<td>7:00 a.m. – 8:00 a.m.</td>
<td>Continental Breakfast</td>
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<td>8:00 a.m. – 10:00 a.m.</td>
<td><strong>Opening Plenary Session</strong></td>
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<td>10:00 a.m. – 10:30 a.m.</td>
<td><strong>Break</strong></td>
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<td>- Session 4: Road Surfacings Part 1</td>
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<td>- Session 5: Rural Roadway Safety Plans, Technology and Research</td>
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<td>- Session 6: Tools for Geotechnology Applications</td>
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<td>- Session 7: Cold Regions &amp; Climate Change</td>
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<td>- Session 8: Pavement Management</td>
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<td>- Session 9: Road Surfacings Part 2</td>
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<td>3:00 p.m. – 3:30 p.m.</td>
<td><strong>Break</strong></td>
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<td>3:30 p.m. – 5:00 p.m.</td>
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<td>- Session 10: Planning and Economics</td>
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<td>- Session 11: Unpaved Road Management Part 1</td>
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<td>- Session 12: Geosynthetics in Low Volume Roads</td>
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<td>- Session 13: Drainage &amp; Stream Crossings</td>
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<td>- Session 14: International Perspectives on Climate Resiliency and Adaption for Low-Volume Roads</td>
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</table>
Session 15: Education for Low Volume Road Engineers

10:00 a.m. – 10:30 a.m. Break

10:30 a.m. – 12:00 p.m. Concurrent Sessions

Session 16: Stabilization
Session 17: Unpaved Road Management Part 2
Session 18: Pooled Fund States Part 1: Local Bridge Programs in 10 States

12:00 p.m. – 1:00 p.m. Lunch

1:00 p.m. – 5:30 p.m. Conference Field Trip

6:00 p.m. – 8:30 p.m. Conference Banquet

Wednesday, September 18, 2019

7:30 a.m. – 8:30 a.m. Continental Breakfast

7:30 a.m. – 3:30 p.m. Registration

8:30 a.m. – 10:00 a.m. Concurrent Sessions

Session 19: Safety
Session 20: Developments in LVR Pavement Design and Management
Session 21: Pooled Fund States Part 2: Local Bridge Programs in 10 States

10:00 a.m. – 10:30 a.m. Break

10:30 a.m. – 12:00 p.m. Concurrent Sessions

Session 22: Pavement Evaluation
Session 23: Autonomous Vehicles on Low Volume Roads
Session 24: ReCAP: Research for Community Access Partnership

12:00 p.m. – 1:30 p.m. Lunch

1:30 p.m. – 3:00 p.m. Concurrent Workshops

Session 25: Mini Workshop – Unpaved Roads
Session 26: Mini Workshop – Pavement Management
Session 27: Mini Workshop - Safety

3:00 p.m. – 3:30 p.m. Break

3:30 p.m. – 5:00 p.m. Closing Plenary Session

Thursday, September 19, 2019

8:30 a.m. – 10:00 a.m. LVR 2019 Conference Committee Meeting (MEMBERS ONLY)
As of Monday, September 9, 2019

Sunday, September 15

8:00 a.m. – 5:30 p.m.
REGISTRATION

9:00 a.m. – 12:00 p.m., Concurrent Workshops
SESSION 1: MORNING WORKSHOPS

Converting Distressed Paved Roads to Engineered Unpaved Roads
Laura Fay, Western Transportation Institute; and David Jones, University of California, Davis

Timber Bridge Load Rating Using Load and Resistance Factor Rating (LRFR)
J. Scott Groenier, United States Department of Agriculture (USDA) Forest Service

Steps for Making Low Volume Roads More Climate Resilient
Gordon Keller, Genesee Geotechnical; Asif Faiz, Faiz and Associates; Glen Legere, FPInnovations; Mark Partington, FP Innovations; and Alex Campbell, AnyWay Solutions

12:00 p.m. – 1:00 p.m.
LUNCH (On You Own)

1:00 p.m. – 4:30 p.m., Concurrent Workshops
SESSION 2: AFTERNOON WORKSHOPS

Unstable Slope Management Program (USMP) for Low Volume Roads
Tickets Required
Eric Bilderback, National Park Service; and Douglas Anderson, Federal Highway Administration (FHWA)

Unmanned Aerial Vehicles (UAVs) in Low Volume Road Management
Colin Brooks, Michigan Technological University; Richard Dobson, Michigan Technological University; and Joe Campbell, Federal Highway Administration (FHWA)

Low-Cost Safety Improvements for Low Volume Roads
Keith Knapp, Iowa State University; Rosemarie Anderson, Federal Highway Administration (FHWA); and Nicole Oneyear, Iowa State University

5:30 p.m. – 7:00 p.m.
EXHIBITS OPEN
Monday, September 16

7:00 a.m. – 8:00 a.m.
**CONTINENTAL BREAKFAST**

7:00 a.m. – 5:00 p.m.
**REGISTRATION**

8:00 a.m. – 10:00 a.m.
**OPENING PLENARY SESSION**

*David Jones, University of California, Davis*

Welcome from Conference Chair
*David Jones, University of California, Davis*

Welcome from Glacier National Park
*Jeff Mow, Glacier National Park*

Welcome from Flathead County, Montana
*Mike Pence, Flathead County Montana*

Yoder Award Presentation
*Nancy Whiting, Transportation Research Board (TRB)*

Towards Shared Stewardship of Rural Low Volume Road Systems – Federal, State & Local Partnerships
*Gary Danczyk, United States Department of Agriculture (USDA) Forest Service*

LTAP: Helping the Low Volume Road Community
*David Orr, Cornell Local Roads Program; and Matthew Ulberg, Montana State University*

Low Volume Roads Role in Disaster Recovery and Network Resilience: A Case Study
*Philip Barutha, University of Nebraska Lincoln*

10:00 a.m. – 10:30 a.m.
**BREAK**
SESSION 4: ROAD SURFACINGS PART 1
David Orr, Cornell Local Roads Program, moderator

The Performance Evaluation of Emulsified Asphalt Residue
Zhanping You, Michigan Technological University

Design, Construction, and Preliminary Investigations of Otta Seal in Iowa
Sharif Gushgari, Iowa State University

Full Scale Field Implementation of Otta Seal in Iowa
Brian Moore, Iowa County Engineers Association Service Bureau

Performance of Chip Seal Treatments in Two Different Climatic Regions
Adriana Vargas-Nordcbeck, National Center for Asphalt Technology

Chloride Stabilized Roads versus Thin Bituminous Surface: A Comparative Analysis
Alondra Chamorro, Pontificia Universidad Catolica De Chile

Assessing Bio-Based Fog Seal for Asphalt Pavement Preservation
Bo Yang, Iowa State University

Role of Preventive Treatments in Low-Volume Road Maintenance Program: A Full-Scale Case Study
Farhang Jalali, PhD candidate, NCAT

Effect of Preservation Treatments on the Structural Performance of Pavements: A Study from NCAT’s Low-Volume Preservation Sections
Md Rahman, Graduate Student, National Center for Asphalt Technology (NCAT)

SESSION 5: RURAL ROADWAY SAFETY PLANS, TECHNOLOGY, AND RESEARCH
Mike Fitch, Ohio Department of Transportation (ODOT), moderator

Rural Research Roadmap: Safety Ideas
Jamie Sullivan, Western Transportation Institute

Local Road Safety Plan Implementation Peer Exchange: Addressing Low Volume Roads
Rosemarie Anderson, Federal Highway Administration (FHWA)

Rural Intelligent Transportation Systems Toolkit: Operations and Safety
Natalie Villwock-Witte, Western Transportation Institute
Driving FoRRRwD to Reducing Rural Roadway Departures
Dick Albin, Federal Highway Administration (FHWA)

SESSION 6: TOOLS FOR GEOTECHNOLOGY APPLICATIONS
Gordon Keller, Genesee Geotechnical, moderator

USFS, Region 1, GIS Semi-Automated Landslide Inventory Tool
Teresa Morales, United States Department of Agriculture (USDA) Forest Service, Region 1

A Photogrammetric Method for Obtaining Soil Density
Ernest Berney, US Army Corps of Engineers (USACE)

Using UAS Technology/Orthoimagery to Assess Pre- and Post-Construction Conditions
Teresa Morales, United States Department of Agriculture (USDA) Forest Service, Region 1

A UAS Photogrammetric Method for Determining Volume Changes in Man-Made Stockpiles
Bryan Ward, US Army Corps of Engineers (USACE)

12:00 p.m. – 1:30 p.m.
LUNCH

1:30 p.m. – 3:00 p.m., Concurrent Sessions
SESSION 7: COLD REGIONS & CLIMATE CHANGE
Bethany Kunz, US Geological Survey, moderator

Development and Pilot Installation of a Scalable Environmental Sensor Monitoring System for Freeze-Thaw Monitoring Under Granular-Surfaced Roadways
Derya Genc, Ph.D. Candidate and Graduate Research Assistant

Comparison of Three Degree-Day Models for Application of Spring Load Restrictions on Low Volume Roads
Chud Lundgreen, United States Department of Agriculture (USDA) Forest Service

Accuracy Assessment of Satellite-Based Freeze-Thaw Retrievals (SMAP) at Low Volume Roads in the United States
Simon Kraatz, University of New Hampshire

When Should Agencies Post Weight Limits on Local Highways in New York State?
David Orr, Cornell Local Roads Program

Construction of Chemically and Mechanically Stabilized Test Sections to Reduce Freeze-Thaw Damage of Granular Roads
Jeramy Ashlock, Iowa State University
Climate Change Risk Assessment and Risk Management for Transportation Infrastructure in United States National Forests
Leslie J. Boak, United States Department of Agriculture (USDA) Forest Service

Impact of CO₂ Emissions on Low Volume Road Maintenance Policy – Case Study of Serbia
Goran Mladenovic, University of Belgrade

Making Rural Access Roads More Resilient
Raquel Damiao Langa Abubacar, ANE

Lessons Learned and Recommendations from Embedding Climate Change Adaptation into the Roads Sector - From Policy to Practice
Alize le Roux, CSIR, South Africa

SESSION 8: PAVEMENT MANAGEMENT
Asif Faiz, Faiz and Associates, moderator

Accuracy of Statewide Pavement Surface Evaluations and Ratings Performed by Local Agencies
Sharlan Montgomery Dunn, NCE

Using Summer Interns to Develop Pavement Management Plans for Local Highway Agencies in New York State
Geoff Scott, Cornell Local Roads Program – NY LTAP

A Framework for Monitoring of Road Agency Performance in Rural Road Asset Management
Charles Bopoto, ReCAP & AfCAP

Impact of Improved Fords Construction on Sediment Yield
Karelle Gilbert, Université Laval

SESSION 9: ROAD SURFACINGS PART 2
Vanessa Goetz, Iowa Department of Transportation (IowaDOT), moderator

Nuggets from Minnesota’s Research, Implementation and Deployment of Pervious Concrete in Low Volume Roads
Bernard Izevbekhai, Minnesota Department of Transportation (MnDOT)

Concrete Pavement Options for Resilient Low Volume Roads in Pacific Island Countries
Sam Johnson, World Bank
Recycled Building Materials for Asphalt Pavement in Low Volume Agriculture Roads  
Hesham Mahgoub, Engineering and Research International, Inc. (ERI)

Rural Track Paths on Low Volume Roads in Austria  
Wolfgang Haslehner, University of Natural Resources and Life Sciences; State Government of Burgenland, Eisenstadt, Austria

3:00 p.m. – 3:30 p.m.  
BREAK

3:30 p.m. – 5:00 p.m., Concurrent Sessions  
SESSION 10: PLANNING AND ECONOMICS  
Chris “Chud” Lundgreen, United States Department of Agriculture (USDA) Forest Service

Options for Aging and Deficient Low-Volume Road Bridges  
Gordon Keller, Genesee Geotechnical

Topological Connectivity Criteria for Low-Volume Road Network Design and Improvement  
Wubeshet Woldemariam, Purdue University Northwest

Connectivity, Accessibility, and Mobility Relationships in the Context of Low-Volume Road Networks  
Samuel Labi, Purdue University

Using Travel Demand Model to Estimate Traffic Volumes on Low-Volume Roads in Wyoming  
Khaled Ksaibati, University of Wyoming

Estimating AADT for Low Volume Roadways: A Case Study in Louisiana  
Xiaoduan Sun, University of Louisiana at Lafayette

Evidence-Based Investment Planning for Unsealed Roads  
Julie Muir, Central Otago District Council and Director of IDS (Infrastructure Decision Support)

A Novel Performance-Based Economic Analysis Approach: Case Study of Iowa Low Volume Roads  
Sajjad Satvati, Iowa State University

SESSION 11: UNPAVED ROAD MANAGEMENT PART 1  
Edward Hoppe, Virginia Transportation Research Council, moderator
Guide Specification for Gravel Road Surfacing
Stephen Monlux, LVR Consultants, LLC

Benefits and Limitations of Installing Driving Surface Aggregate at Two Federal Lands Sites
Bethany Kunz, U.S. Geological Survey

Clay Content Optimization for Gravel Road Surfacing
Stephen Monlux, LVR Consultants LLC

Use of Gravel Loss Prediction Models in the Design and Management of Unsealed Road Pavements
Adriaan (Ian) Van Wijk, Aurecon

Long-Term Study on the Cost-Effectiveness of Dust Control and Untreated Aggregate-Surfaced Resource Roads
Glen Legere, FPInnovations

SESSION 12: GEOSYNTHETICS IN LOW VOLUME ROADS
Stefan Louw, University of California, Davis, moderator

Fiberglass Ace Mat as a Temporary, Rapid Alternative to Unpaved Road Surfaces
Daniel Harder, U.S. Army Engineer Research and Development Center

Monitoring the Performance of Unreinforced and Geosynthetic Reinforced Pavements on Forest Roads
Justin Long, Washington Department of Natural Resources

Mechanistic Analyses of Geosynthetic Reinforced Aggregate Road Test Sections
Jeb Tingle, US Army Corps of Engineers (USACE)

Experimental Studies on Coir Geotextile Reinforced Low Volume Rural Roads
Sunitha V, National Institute of Technology Tiruchirappalli

Enhancing Pavement Performance for Low Volume Roads Using Tire-Derived Geo-Cylinders
PV Vijay, West Virginia University
Tuesday, September 17

7:30 a.m. – 8:30 a.m.
CONTINENTAL BREAKFAST

7:30 a.m. – 1:00 p.m.
REGISTRATION

8:30 a.m. – 10:00 a.m., Concurrent Sessions
SESSION 13: DRAINAGE & STREAM CROSSINGS
Lyan Garcia, US Army Corps of Engineers (ERDC), moderator

Superficial Drainage Control: Facts That Affected the Construction of Loboguerrero Divided Highway Project
Maria Fernanda, Serrano Guzman, Pontificia Universidad Javeriana - Cali

Understanding Ditch Maintenance Decisions of Local Highway Agencies for Improved Water Resources across New York State
David Orr, Cornell Local Roads Program

Retrofitting the Rural Roadside Ditch Network to Treat Nitrogen from Agricultural Runoff Using Woodchip Bioreactors
Eric Chase, Center for Dirt and Gravel Road Studies - Penn State University

Optimization of LVR Design of Flooding and Debris Control Activities in Selected Caribbean Areas Including Dominica, Considering Local Climate and Development Changes
Jacob Greenstein, USAID

Improving Road Stream Crossings for Storm Resiliency and Aquatic Organism Passage: Pennsylvania Case Study
Steve Bloser, Penn State University

Proposed AASHTO-Ready Specifications for Load Rating and Redundancy Evaluation of Railroad Flatcars Used as Highway Bridges on Low-Volume Roads
Robert Connor, Purdue University

Flexible Buried Bridges for Low Volume Road Crossings
Joel Hahm, Big R Bridge
SESSION 14: INTERNATIONAL PERSPECTIVES ON CLIMATE RESILIENCY AND ADAPTATION FOR LOW-VOLUME ROADS
Glen Legere, FPInnovations, moderator

North America
Mark Partington, FP Innovations

South East Asia
Ashok Kumor, World Bank

South America
Gordon Keller, Genesee Geotechnical

Southern Africa
Alize LeRoux, Council for Scientific & Industrial Research

SESSION 15: EDUCATION FOR LOW VOLUME ROAD ENGINEERS
Ron Eck, West Virginia University, moderator

Training and Education for Forest Roads: Use of Experiential Learning with Forestry Students within Coursework at a Land Grant University
Mike Aust, Virginia Polytechnic Institute and State University

Panel Discussion
Ben Worel, Minnesota Department of Transportation (MnDOT); Dale Heglund, North Dakota State University; Steve Bloser, PSU Dirt and Gravel Roads Center; Leslie Boak, US Forest Park; and Mike Aust, Virginia Polytechnic Institute and State University

10:00 a.m. – 10:30 a.m.
BREAK

10:30 a.m. – 12:00 p.m., Concurrent Sessions
SESSION 16: STABILIZATION
Alex Visser, University of Pretoria, moderator

Stabilizing Sand Roads Using Pulp and Paper Mill Boiler Ash
Mark Russell, US Army Corps of Engineers (USACE)

Use of Recycled Concrete Aggregates in Mechanical Stabilization for Low Volume Roads
Dr. Jaya R Shinganmakki, Rasta Center for Road Technology India; and Nabeel Muhamed, Rasta Center for Road Technology
Rapid Rehabilitation of Highly Distressed Low Volume Roads in Papua New Guinea Using In-Situ Soil Recycling with Hydraulic Soil Stabilization
Alex Campbell, Anyway Solutions,

Cement Stabilized Flyash for Application in Structural Layers of Low Volume Road Pavements
Umesh Chandra Sahoo, Indian Institute Of Technology, Bhubaneswar, India

Assessment of the Potential for Salt Damage to Asphalt Surfacings When Chloride-Treated Unpaved Roads Are Upgraded to a Sealed Standard
David Jones, University of California, Davis

Improving Low-Volume Asphalt Roads with Lignosulfonate-Based Additives
Magne Matuz-Thingnaes, Borregaard

Stabilization of Pavement Foundation Material Using Polymeric Additive: Characterization and Performance
Romel Georgees, Kirkuk University, Kirkuk, Iraq

SESSION 17: UNPAVED ROAD MANAGEMENT PART 2
Omar Albatayneh, University of Wyoming, moderator

Inventory-Based Rating System™, A Stable and Implementable Method of Condition Assessment for Unpaved Roads
Tim Colling, Michigan Technological University

Development and Application of a Sustainable Management System for Unpaved Rural Road Networks
Alondra Chamorro, Pontificia Universidad Catolica de Chile

A Pragmatic Approach for Dust Monitoring on Unsealed Roads
Theunis Henning, University of Auckland

SESSION 18: POOLED FUND STATES 1: LOCAL BRIDGE PROGRAMS IN 10 STATES
Edward Hoppe, Virginia Department of Transportation (VDOT), moderator

Michigan
Mark Harrison, Michigan Department of Transportation, (MDOT)

Virginia
Edward Hoppe, Virginia Department of Transportation (VDOT)

Utah
Jason Simmons, Utah Department of Transportation (UDOT)
Alaska

*Darryl Lester, Alaska Department of Transportation and Public Facilities*

Louisiana

*David North, Louisiana Department of Transportation & Development (DOTD)*

12:00 p.m. – 1:00 p.m.

**LUNCH**

1:00 p.m. – 5:30 p.m.

**CONFERENCE FIELD TRIP**

**Field Tour Stops**

-Unstable Slope Management Program (USMP) for Low Volume Roads-
Doug Anderson, Federal Highway Administration (FHWA); and Eric Bilderback, National Park Service

-Aquatic Organism Passage (AOP) for Low Volume Roads-
Craig Kendall, United States Department of Agriculture (USDA); Scott Spaulding, United States Department of Agriculture (USDA); and Cliff Lewis, United States Department of Agriculture (USDA)

-Dust Abatement Tactics and Lessons Learned for Low Volume Roads-
Dave Prunty, Flathead County, MT

-RoadRoid - Smartphone App to Assess Road Condition-
Lars Forslof, Roadroid AB

-Unmanned Aerial Vehicle (UAV) Field Demonstration-
Colin Brooks, Michigan Technological University; and Richard “Rick” Dobson. Michigan Technological University

6:00 p.m. – 8:30 p.m.

**CONFERENCE BANQUET**

Diamond B. Wedding Barns
Wednesday, September 18

7:30 a.m. – 8:30 a.m.
CONTINENTAL BREAKFAST

7:30 a.m. – 3:30 p.m.
REGISTRATION

8:30 a.m. – 10:00 a.m., Concurrent Sessions
SESSION 19: SAFETY
Ricky Mitchell, Mobile County, Alabama, moderator

- Development of a New Daytime Process for the Evaluation of Sign Retroreflectivity
  Dale Heglund, NDSU/UGPTI/NDLTAP

- Initial Analysis of Ohio’s Township Sign Grant Program
  Alejandro Chock, Mott MacDonald

- Identifying Candidate Locations for Safety Improvements on Low-Volume Rural Roads: The Oregon Experience
  Ahmed Al-Kaisy, Montana State University

- Pedestrian Safety Assessment around Schools in Small Cities – Case Study
  Hesham Mahgoub, Engineering and Research International, Inc. (ERI)

- Safety Performance Functions of Low-Volume Roadways
  Subasish Das, Texas A&M Transportation Institution

- Reliability Based Prediction of Number of Crashes on Low Volume Roads in Montana Using the Equivalent Property Damage Only Crash Indicator
  Sudip Bhattacharjee, Alabama A&M University

- Modeling Severities of Motorcycle Crashes at Low-Volume Roadways
  Khaled Ksaibati, University of Wyoming

- A Tool for Improving the Geo-Coordinates of Crashes for Local Roads – CLIP
  Mario Romero, Purdue University
SESSION 20: DEVELOPMENTS IN LVR PAVEMENT DESIGN AND MANAGEMENT
Alex Campbell, Anyway Solutions, moderator

Applying Pavement Preservation Principles in Unpaved Road Management with Specific Reference to Fines Preservation and Dust Control
David Jones, University of California Davis

- Application of New Technologies in Mining Industry to Low-Volume Roads
  Alex Visser, University of Pretoria

- Optimization of Low Volume Road Maintenance Strategies
  Gerrie Van Zyl, Mycube Asset Management Systems

- Comparative Analysis of the DCP-DN Design Approach Against Other Methods Used for Upgrading of Low Volume Roads: Case of Uganda And Zambia
  Joseph Chibwe, Road Development Agency

SESSION 21: POOLED FUND STATES PART 2: LOCAL BRIDGE PROGRAMS IN 10 STATES
Eric Cowles, Iowa Department of Transportation (IowaDOT), moderator

- Illinois
  Stephanie Seck-Birhame, Illinois Department of Transportation (IDOT)

- Iowa
  Eric Cowles, Iowa Department of Transportation (IowaDOT)

- Kansas
  Tod Salfrank, Kansas Department of Transportation (KDOT)

- Ohio
  Steve Luebbe, Fayette County Engineers Office

- Wisconsin
  David Stertz, Wisconsin Department of Transportation (WisDOT)

10:00 a.m. – 10:30 a.m.
BREAK
SESSION 22: PAVEMENT EVALUATION

Alondra Chamorro, Pontificia Universidad Catolica de Chile, moderator

Integrating Unmanned Aerial System Based Road Corridor Canopy Mapping with Real-Time Dust Monitoring
Eric Chase, Center for Dirt and Gravel Road Studies - Penn State University

Use of Cell Phone Apps to Evaluate Low Volume Roads in Illinois
Mohammad Hossain, Bradley University

Utilizing Smartphones and Image Processing Analysis for Evaluating Dust on Gravel Roads
Khaled Ksaibati, University of Wyoming

Do-It-Yourself Street View - Using 360° Camera Technology for Managing Low-Volume Roads
John Coburn, Olsson

Evaluation and Performance of Low Volume Roads
Richard A. Reid, South Dakota State University

Correlating Visual/Windshield Inspection Pavement Condition to Distresses from Automated Surveys Using Classification Trees
Georges Bou Saab, Arcadis U.S., Inc.

SESSION 23: AUTONOMOUS VEHICLES ON LOW VOLUME ROADS

Laura Fay, Western Transportation Institute, moderator

Overview and National Level Perspective of Autonomous Vehicles on Low Volume Rural Roads
Chris Albrecht, The Narwhal Group

Perspectives on Autonomous Vehicles in National Parks and Other Public Lands
Steve Suder, National Park Service

Getting Into the Specific Challenges of Autonomous Vehicles on Low Volume Rural Roads
Chris Albrecht, The Narwhal Group

Autonomous Truck Platooning on Forest Roads
Glen Legere, FPInnovations
SESSION 24: ReCAP: RESEARCH FOR COMMUNITY ACCESS PARTNERSHIP
Samuel Ampadu, Kumasi National University, Ghana, moderator

Introduction
Nkululeko Leta, Cardno UK /ReCAP

Transport Sector Leadership Development Programme (TSLDP) – Establishment of Centre for Sub-Saharan Transport Leadership
Nkululeko Leta, Cardno UK /ReCAP

Establishment and Growth of a Road and Transport Research Centre in Uganda
Mark Henry Rubarenzya, Uganda National Roads Authority

Establishment of a Road and Transport Research Center in Mozambique
Irene Simoes, The Road Fund

Research Capacity Building Intervention in Rural Road Sector in Myanmar
Soe Htun Naing, Chief Engineer (Director of RDU)

Outcome of Research Capacity Building in Tanzania
Fikiri Magafu, Researcher and Administrator

12:00 p.m. – 1:30 p.m.
LUNCH

1:30 p.m. – 3:00 p.m., Concurrent Mini Workshops
SESSION 25: MINI WORKSHOP – UNPAVED ROADS
Ben Worel, Minnesota Department of Transportation (MnDOT), moderator

Unpaving material design
Stefan Louw, University of California, Davis

Chemical treatment selection
David Jones, University of California, Davis

Mobile Dynamic Cone Penetrometer Analysis Program
Ernest Berney, US Army Corps of Engineers (ERDC)

SESSION 26: MINI WORKSHOP – PAVEMENT MANAGEMENT
Ricky Mitchell, Mobile County, Alabama

Determining Dust Levels on Gravel Roads Using Image Processing
Omar Albatayneh, University of Wyoming
Optimization Tool for Selecting Gravel Roads Maintenance Strategies  
Omar Albatayneh, University of Wyoming

Roadresource.Org Recycling and Preservation Guidance  
Stefan Louw, University of California, Davis

SESSION 27: MINI WORKSHOP – SAFETY  
Jamie Sullivan, Western Transportation Institute

Crash Tree Program  
Dick Albin, Federal Highway Administration

Work Zone Pocket Guide  
Mark J. Eicher, Muskingum County, Ohio

Traffic Sign Installation Guide  
Geoffrey Scott, Cornell Local Roads Program

3:00 p.m. – 3:30 p.m.  
BREAK

3:30 p.m. – 5:00 p.m.  
CLOSING PLENARY SESSION

A Look to the Future of Low Volume Roads: Wrapping Up a Career  
Ken Skorseth, South Dakota, (retired)

A Look to the Future of Low Volume Roads: Just Starting a Career  
Alize Le Roux, Council for Scientific & Industrial Research

Resolutions and Closing Remarks  
David Jones, University of California Davis

Thursday, September 19

8:30 a.m. – 10:00 a.m.  
LVR 2019 CONFERENCE COMMITTEE MEETING (members only)
The Transportation Research Board (TRB) 99th Annual Meeting will be held January 12–16, 2020, at the Walter E. Washington Convention Center, in Washington, D.C. The information-packed program is expected to attract more than 13,000 transportation professionals from around the world.

The meeting program will cover all transportation modes, with more than 5,000 presentations in nearly 800 sessions and workshops, addressing topics of interest to policy makers, administrators, practitioners, researchers, and representatives of government, industry, and academic institutions. A number of sessions and workshops will focus on the spotlight theme for the 2020 meeting: *A Century of Progress: Foundation for the Future.*

**TRB CALENDAR OF UPCOMING EVENTS**

Visit the TRB Calendar website at [http://www.trb.org/Calendar/Calendar.aspx](http://www.trb.org/Calendar/Calendar.aspx)
(Conferences cosponsored by TRB are denoted with an asterisk.)

- 9th International Visualization in Transportation Symposium: Visualization in Action; November 5-6, 2019; Washington, DC
- Transportation Resilience 2019: 2nd International Conference on Transportation System Resilience to Natural Hazards and Extreme Weather; November 13-15, 2019; Washington, DC
- First International Conference on 3D Printing and Transportation; November 20-21, 2019; Washington, DC
- Conference on Health and Active Transportation; December 11-12, 2019; Washington, DC