



National Road
Research Alliance

January
Flexible Team
Meeting
Minutes



Meeting Agenda

- Welcome and Introduction: Curt
- General NRRRA Updates: Ben/Lauren
- Research Pays Off: Lauren
- Research Project Updates
- Discussion on re-structuring project pages and updating project pages
- Discussion on implementation of Completed NRRRA Research by Member Agencies and Potential Topics for the 2024 NRRRA Conference

General NRRA Updates

No new attendees present today at the meeting

General NRRRA Updates

Ben

TRB annual Meeting

When we attend the TRB annual meeting it will be great to see everyone and see all the great research being done. We will have a Sunday night NRRRA meeting scheduled from 5:30 – 6:30 EST in the 102 B at the convention center. I plan to have a 30-minute talk. If you have other people from other states or friends let them know about the meeting as well.

NRRRA Contracting

There are still projects out there that are still trying to get contracting finished up. The contracting people should be up and running now after the holiday break. There are also a couple of RFP's that also need to be put out.

General NRRA Updates

Ben

Team Meetings

Any of you that have a topic to share please put your hand up and volunteer and share with the rest of the team what is going on. This invitation is for both Associate and Agency members. We do a lot of good research at NRRA, but the sharing aspect helps a great deal as well.

NRRA Spring Conference

30th of April – May 1st! Lauren is setting up the website and a draft agenda. The focus is on implementation. The first day is a full day. We are not going to break into separate groups. We will be setting up speakers and highlighting what has been implemented or how it should be implemented, so it is up to the separate teams to choose what speakers and topics they want discussed.

MNROAD Construction (2024)

There will be 10 Concrete test sections built on the mainline.

Research Pays Off

Lauren:

February 20, 2024

TBD

March 2024

TBD

April 2024

Effect of Low and Moderate Recycled Concrete Aggregate Replacement Levels on Concrete Properties presented by Rita Lederle, Ph.D., P.E., University of St. Thomas

Michael: For those attending TRB, if you see any good presentations while attending, please consider them as possible “Research Pays Off” topics.

[Research Pays Off Webinar Series - NRRA - MnDOT \(state.mn.us\)](https://state.mn.us)

NRRA Research Project Updates

Mix Rejuvenator Test Sections (Phase II)

Jo Sias: Received year 4 field cores and are in the process of testing those. We will be doing some pavement evaluation and expect to see the draft final report towards the end of spring.

Validation of Loose Mix Aging Procedures for Cracking Resistance Evaluation in Balanced Mix Design

Joseph: Working on putting together Phase 2A and will send it out to the TAP and set up a meeting in February.

NRRA Research Project Updates

Reclamation and Recycling Techniques to Achieve Perpetual Pavement Characteristics

Eshan: We are on Task 5 (Lab Testing). Thank you for the cores from the MNROAD sections. They are being extracted for binder recovery. As soon as that is done the binder will be sent to us and we will conduct a binder evaluation. I will also mention that we have pretty much wrapped and analysis as well on the pavement sections using PerRoad and MNPAVE where we used FWD testing and back calculated values that MNROAD provided to us. Also, we had some discussion that while these sections are very good the challenge is they are only going to see a limited amount of traffic for perpetual pavement analysis. Ashley Buss was very helpful with providing us with a data base from the Iowa pavement management system and other data sets as well. Ashely has put together these spread sheets with a lot of data extracted from some of their full depth pavements sections, so we have a good comparison basis to leverage the MNROAD sections which only have a few years of data and traffic. Thank you, Ashley for providing that data to us. The MNROAD sections are still very valuable because they are very well characterized, and we have materials from these and NDT data as well, but this added data from Iowa provides the calibration/verification information to go together with it.

Ashely: Eshan, I will continue to work on getting additional performance curves together also.

NRRA Research Team Discussion

Restructuring and Update Project Pages

- Should we restructure the Flexible Team Project Page similar, to the Rigid Team Page?
- Please continue to update your project pages as the research progresses!

The Flexible Team discussed re-structuring the flexible team webpage. It was the consensus to re-structure it like the Rigid team did. We discussed separate categories to put the current research projects under.

NRRA Research Team Discussion

2024 NRRA Conference

- April 30-May1 (1.5-day conference with a focus on implementation with Tours/Meetings on the second day in the PM after the meeting)
- Planning Committee (Team and Assistant Chairs, Ben Worel, Jeff Brunner, Curt Turgeon, Lauren Dao)
- Draft Agenda attached (teams are asked to develop)
 - 75 min on projects being implemented or what is needed to implement them
 - 30 min update on current team activities and selected project highlight
- Conference Location: Shoreview Community Center

The team also discussed potential speakers for the 1st day (Implementation Track) and for the 2nd day (update and Highlighted Project Track).

Ashly Buss suggested having a Balanced Mix Design implementation track. Elli Hajj University of Nevada Reno suggested asking Derek-Nanner Plant from FHWA to kick off the table discussion.

Ashley: I like the Balanced Mix Design discussion Idea. I think that would generate a lot of interest and then all states can talk about where they are with it and where they are going as far as further implementation. I think it would be interesting to see where everyone is at with it.

NRRA Research Team Discussion

On the following slides I have included Ben Worel's slides used for his presentation at the NRRA January 7th meeting held the 2024 TRB annual meeting

NRRA

**National Road
Research Alliance**



2024 NRRA TRB Meeting

Benjamin Worel, P.E.^(MN)

MnDOT

MnROAD Operations Engineer

NRRA Executive Director

CLICK TO EDIT MASTER

Welcome

Group Introductions

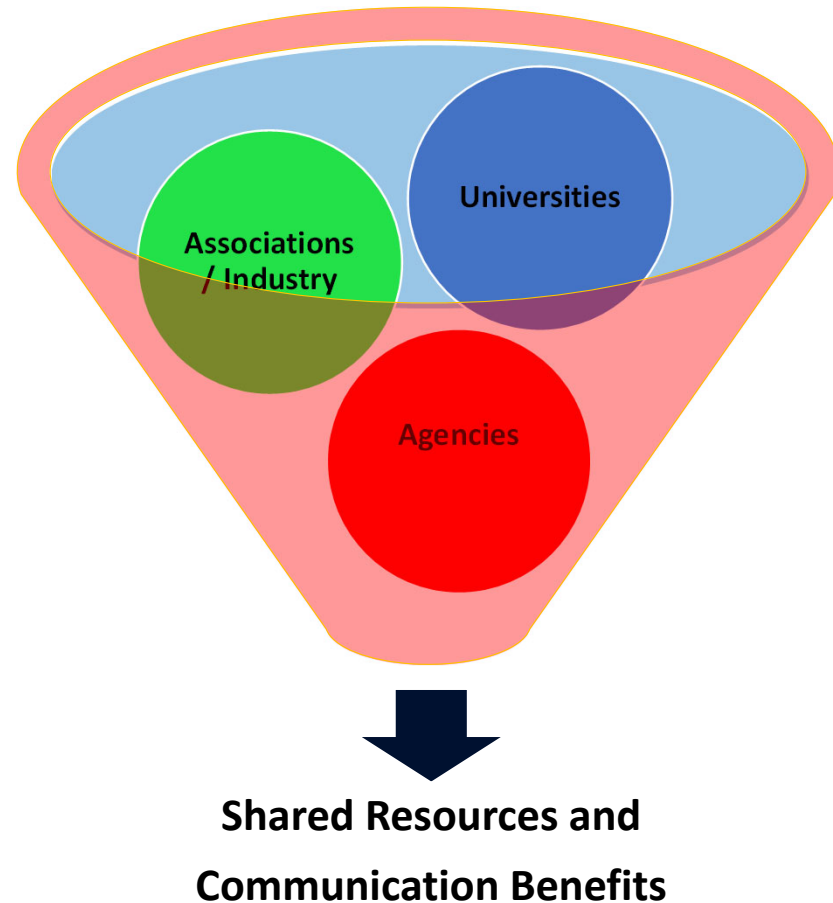
Report on NRRA related TRB sessions you know of
or what you like about NRRA



Agenda

Brief Overview of NRRRA

Focus on People, Data, and Partnership Opportunities



Why NRRA was initially Developed?

• History

- 4 state consortium (CA, MN, TX, WA)
- Frozen Four (IL, MI, MN, WI)
- TERRA (IA, MN, MI, NY, NY, WI)
- NRRA

Benefits

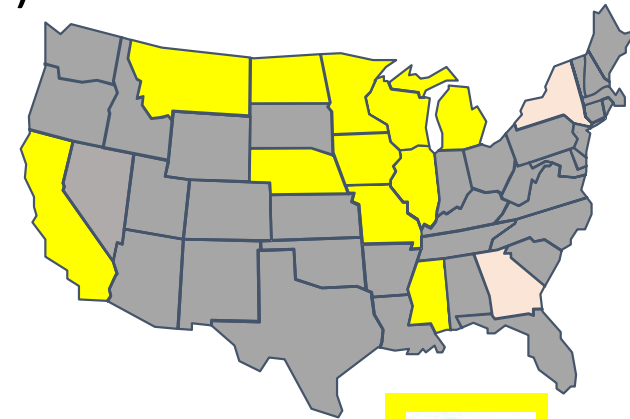
- Strength in numbers
- Less costly for doing research
- Allow states to cross borders
- Less project duplication (we all don't do the same project)
- Greater Communication (State/Consultant/University/Associations)
- Buy-In (everyone is apart of the process)
- Shared Resource (MnROAD)



Pooled Fund Membership Commitments

TPF-5(466) - Fee Structure / year (five years)

- **Phase-1 complete (5 yr) – Now into Phase-2 (year 2/5)**
- **13 Full Agency Commitments (yellow)**
 - \$75K /\$150K Annual Commitment
 - 11 States, Illinois Tollway, LRRB
 - FHWA is also a contributing partner
- **2 ICT Commitments (Green)**
 - \$25K (ICT Team only – Veta Efforts)
 - GA and NY
- **~85+ Associate membership**
 - 2K/year - Associations, Industry, Consultants, Universities



Current Activities

- **NRRA has averaged ~\$1 million research/year**
- **NRRA Funded 48 projects (phase1) and 29 projects (phase2)**
 - Short and long term research
 - Multiple Universities and Consultants Contracted

- **NRRA Project Development**
 - Ideas developed and prioritized in technical teams
 - Executive Committee reviews and approves
- **2017 & 2022 MnDOT provided MnROAD construction funding**
- **2024(+) MnDOT has budgeted 1 million annual I-94 construction funding**

Organizational Structure

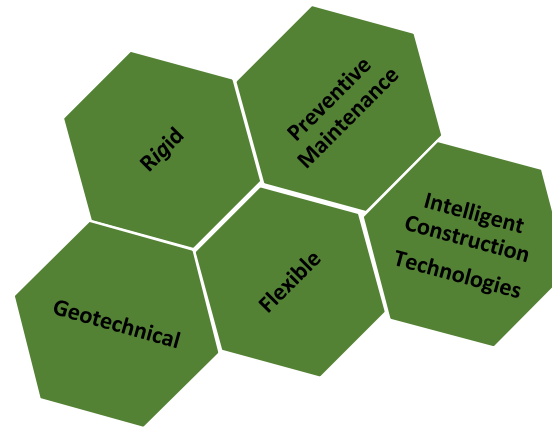
- **Executive Committee (2 reps/agency)**
- **5 Technical Teams (agency and associate reps)**
 - Technical Chairs
 - MnDOT Representative
- **MnROAD Facility Utilized as needed**
- **Outreach is done in the technical teams**
 - Lauren Dao, MnDOT



Outreach Activities

Monthly

- Research Pays off Seminars (online)
- Team Meetings (online)
 - NRRRA General Updates
 - Project Status Reports
 - Common Topic of Interest



Yearly

- Transportation Research Board (2 per agency)
- NRRRA focused Meeting (2+ per agency)



NRRRA Website

- Best Information on Team Members and Funded Project Tracking



Executive Committee Membership

Caltrans

Reimond Garcia*
Tom Pyle*

FHWA

Steve Cooper
Peter Eakman

Illinois

Brian Pfeifer*
Charles Wienrank*

Illinois Tollway

Dan Gancarz*
Cindy Williams*

Iowa

Chris Brakke*
Jeff De Vries*

Michigan

Kevin Kennedy*

Minnesota

Jeff Brunner
Lauren Dao
Duane Hill*
Ben Worel*

Minnesota LRRB

Jim Foldesi* (St. Louis
County)

Mississippi

Alex Middleton*
Cindy Smith*

Missouri

Brett Trautman*

Montana

Oak Metcalfe*
Matt Needham*

Nebraska

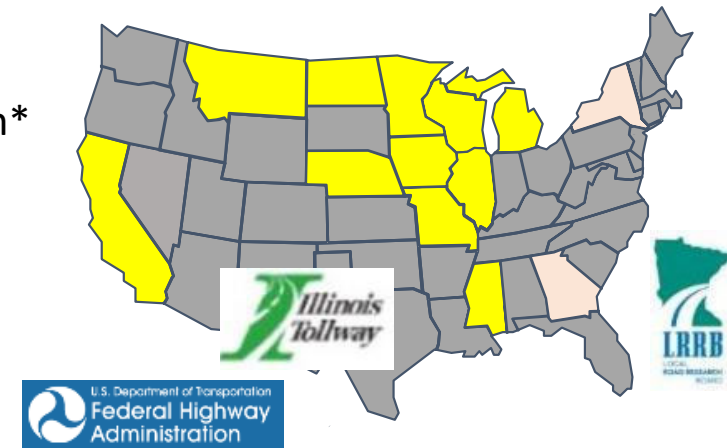
Wally Heyen*
Robert Rea*

North Dakota

Amy Beise*
Aaron Perez*

Wisconsin

Eric Lyngdal*
Barry Paye*



GA and NY → ICT Only

Geotechnical Agency Membership

Caltrans

Deepak Maskey*

FHWA

Peter Eakman

Illinois

Heather Shoup*

Andrew Stolba*

Illinois Tollway

Supraja Reddy*

Michigan

Ryan Snook*

Minnesota

Tim Anderson

Emil Bautista

Terry Beaudry*

Bernard Izevbekhai

Eddie Johnson

Joseph Podolsky

Dave Van Deusen

Raul Velasquez, chair

Ben Worel

Eyoab Zegeye Teshale

Missouri

Lydia Brownell*

Zachary Troesser*

Montana

DJ Berg*

Cameron Kloberdanz*

Miles Yerger

Nebraska, none

North Dakota

Amy Beise

Brent Flaa*

Matt Kurle

Colter Schwagler*

Wisconsin

Haluk Sinan Coban*

David Staab*



* indicates voting agency member

Geotechnical Associate Membership

Bex Abylkhani, First State Tire
Sirous Alavi, Fugro Land USA
Ceren Aydin, Michigan State University
Aritra Banerjee, South Dakota State University
Thomas Bennert, Rutgers University
Andrea Blanchette, Terracon
Jenna Bowers, Ingevity
Aaron Budge, Minnesota State University Mankato
Bora Cetin, Michigan State University
Halil Ceylan, Iowa State University
Denis Charland, Fugro USA Land, Inc.
Surya Congress, NDSU
Tuncer Edil, University of Wisconsin-Madison
Daba Gedafa, University of North Dakota
Majid Ghayoomi, University of New Hampshire
Ali Khosravi, Auburn University
Bill Likos, University of Wisconsin--Madison
Danial Mirzaiyanrajeh, Solmax
Soheil Nazarian, Center for Transportation Infrastructure Systems (UTEP)

Monte Nieme, First State Tire
Chibuike Ogbo, Terracon
Eric Olson, Solmax
Heidi Olson, Braun Intertec
Matt Oman, Mathy Construction
John Puls, Ingios
Anand J. Puppala, Texas A&M University
Hadi Rashidi, National Stone Sand and Gravel Association (NSSGA)
Farhad Reza, Minnesota State University - Mankato
Mohammad Sabouri, Braun Intertec
Mohammadhossein Sadeghiamirshahidi, Michigan Tech
Md Sadiq, Michigan State University
David Saftner, University of Minnesota Duluth
Dan Schellhammer, Midstate Reclamation
Derek Tompkins, American Engineering Testing
Brett Towns, Tricor Refining
Mark Tufenkjian, Cal State LA
David White, Ingios Geotechnics, Inc.
Mohammad Yamin, Minnesota State University - Mankato

Geotechnical Projects

Recycled Aggregates in Aggregate Base and Larger Subbase Materials	Iowa State
Mechanistic Load Restriction Decision Platform for Pavement Systems Prone to Moisture Variations	UNH
Environmental Impacts on the Performance of Pavement Foundation	Michigan State
Permeability of Base Aggregate and Sand	University of Wisconsin
Improve material inputs into mechanistic design properties for reclaimed HMA Roadways	Michigan State University
Continuous Moisture Measurement during Pavement Foundation Construction	UTEP
Performance Evaluation of Wicking Geotextiles for Improving Drainage and Stiffness of Road Foundation	Michigan State Michigan Tech/ Ingios
Flooded Pavements Assessment App–Phase 2	UNH
Improving Moisture Resistance/Control of Pavement Foundation Systems via Engineered Water Repellency	Michigan State University
Instrumentation and data management/analyses for Measurement While Drilling (MWD) technology	MTU
Larger Subbase Materials - Done by Iowa State	SRF
Subgrade Design for New and Reconstructed	SRF

Flexible Agency Membership

Caltrans

Kee Foo*
Raghubar Shrestha*

Illinois

Brian Hill*
James Trepanier
Charles Wienrank*

Illinois Tollway

Jay Behnke*
Ross Bentsen*
John Lavallee

FHWA

Peter Eakman

Minnesota LRRB

James Foldesi*

Michigan

Andrew Bennet
Tyler Hunt
Kevin Kennedy
Nathan Maack*

Minnesota

Michael Vrtis, MnDOT
Ryan Baasen
Emil Bautista
Shongtao Dai*
John Garrity*
Jerry Geib
Joseph Podolsky
Dave Van Deusen
Ben Worel
Eyoab Zegeye Teshale

Iowa

Chris Brakke*
Ashley Buss*

Mississippi

Heath Patterson*
Griffin Sullivan*

Missouri

Jason Blomberg*
Paul Denkler
Willie Johnson*
Dan Oesch

Montana

Josh Heck*
Oak Metcalfe*
Matt Needham

Nebraska

Bruce Barrett*
Wally Heyen
Robert Rea
Brandon Varilek

North Dakota

Curt Dunn, chair
Andy Ayash
Amy Beise
Brandon Bennes
Matt Kurle
Matt Linneman
Arlen Norris
Korby Seward
Tyler Wollmuth*

Wisconsin

Ali Arabzadeh*
Dan Kopacz*
Tirupan Mandal
Ali Morovatdar
Barry Paye*



* indicates voting agency member

Flexible Associate Membership

Mohiuddin Ahmad, University of Texas-El Paso (UTEP)
Riaz Ahmad, iENGINEERING Corporation
Allen Akowicz, Pacific Geosource
Edith Arambula, Texas A&M Transportation Institute
Jason Bausano, Ingevity
Thomas Bennert, Rutgers University
Jay Bianchini, Collaborative Aggregates
Justin Black, Cargill
Andrea Blanchette, Terracon
Brandon Brever, Minnesota Asphalt Pavement Association (MAPA)
Tom Brovold, Testquip
Bill Buttler, University of Missouri - Columbia
Mike Byrnes, Mathy Construction Co.
Douglas Carlson, Liberty Tire Recycling
Eshan Dave, University of New Hampshire
Jonathan Davis, Uberbinder
Mohamed Elkashef, University of California Pavement Research Center
Amy Epps Martin, Texas A&M Transportation Institute
Rouzbeh Ghabchi, South Dakota State University
Oliver Giraldo-Londono, University of Missouri - Columbia
Stacy Glidden, Payne & Dolan
Jonathan Groeger, iENGINEERING Corporation
Fan Gu, NCAT
Elie Hajj, University of Nevada - Reno
Bill Hall, Resource Recycling Systems
Katie Hasslett, HRG Lab
Majeed Hayat, Marquette University
David J. Jones, University of California Pavement Research Center
Dennis Kelley, J. Rettenmaier USA LP
Lev Khazanovich, University of Pittsburgh

Candice Kohn, Asphalt Materials
Emin Kutay, Michigan State University
Brett Lambden, Husky Energy
Fabricio Leiva, Pacific Geosource
Chad Longcore, J. Rettenmaier USA LP
Rajib Mallick, UTEP
Todd Mansell, Caterpillar Paving Products
Mihai Marasteanu, University of Minnesota - Twin Cities
Ken Maser, Infrasense
Luke Meyer, Bio-Based Spray Systems
Danial Mirzaiyanrajeh, Solmax
Kiran Mohanraj, The Transtec Group
Pete Montenegro, Collaborative Aggregates
Raquel Moraes, NCAT
Chibuike Ogbo, Terracon
Eric Olson, Solmax
Brian Orr, BASF
Andrew Peterson, South Dakota State's Local Transportation Program
Hadi Rashidi, National Stone Sand and Gravel Association (NSSGA)
Dave Rettner, American Engineering Testing
Farhad Reza, Minnesota State University - Mankato
Roger Roberts, GSSI
Mohammad Reza Sabouri, Braun Intertec
Baris Salman, Syracuse University
Michael Scardina, Surface Tech
Nick Schaefer, Surface Systems and Instruments, Inc. (SSI)
Debbie Schwerman, Wisconsin Asphalt Pavement Association
Jo Sias, University of New Hampshire
Dan Staebell, Asphalt Pavement Alliance (APA)
Dave Stanczak, Asphalt Materials, Inc.
Brandon Strand, Asphalt Pavement Alliance (APA)
Nabil Suleiman, University of North Dakota
Hassan Tabatabaee, Cargill

Cheng Thao, Payne & Dolan
Chris Theriot, Resource Recycling Systems
Kim Tolzmann, Hardrives
Derek Tompkins, American Engineering Testing
Feng Wang, Texas State University
Hao Wang, Rutgers University
Randy West, National Center for Asphalt Technology (NCAT)
Jason Wielinski, ARRA
R. Chris William, Asphalt Materials & Paving Program (Iowa State)
Richard Willis, National Asphalt Pavement Association (NAPA)
Trey Wurst, Ingevity
Jett Yang, Uberbinder
Fan Yin, NCAT
Hao Yin, Horizon Engineering Consulting
Zhanping You, Michigan Tech Transportation Institute
Fujie Zhou, Texas A&M Transportation Institute



Flexible Projects

Just funded – Balance Mix Design (2nd phase)

Asphalt Mix Rejuvenator Test Sections (added 50K in April 2020)	UNH
Asphalt Mixture Rejuvenator Synthesis	WSB
Cold Asphalt Recycling Technologies using Rejuvenating Asphalt Emulsion: Impact; Implementation; Specification	UNH
Cold Central Plant Recycling	AET
Continued Monitoring of Original I-94 Westbound Asphalt Overlay Sections	UNH
Continued Monitoring of TH6 RA Field Sections	UNH
Field Validation of Using Warm Mix Asphalt at Reduced Production Temperatures for Balanced Mix Design	Auburn University
HMA Overlay and Rehab of Concrete and Methods of Enhancing Compaction	UNH
Impact of Polymer Modification on IDEAL-CT and I-FIT for Balanced Mix Design	NCAT
Innovative Practical Approach To Assessing Bitumen Compatibility As A Means Of Material Specification	Cargill
Longitudinal Joint Construction Performance	SRF
Maintaining Poor Pavements	SRF
MnROAD Reflective Cracking Challenge (NRRRA)	UNH / Auburn
Novel Methods for Adding Rejuvenators in Asphalt Mixtures with High Recycled Binder Ratios	Auburn University
Perpetual Pavements in Wet Freeze Climate	RFP
Reclamation and Recycling Techniques to Achieve Perpetual Pavements Characteristics	Braun Intertec
Recycled Binder Availability	RFP
Reflective Cracking Challenge Coordination (Missouri - 400K)	University of Missouri-Columbia
Standardization of SIP Calculation for Hamburg Wheel Tracking Test	Auburn University
Tack Coats	SRF
Understanding and Improving Pavement Milling Operations	University of New Hampshire
Validation of Loose Mix Aging Procedures for Cracking Resistance Evaluation in Balanced Mix Design	Auburn University / UNH - TTI

Preventive Maintenance Agency Membership

Caltrans

Leo Mahserelli*

FHWA

Peter Eakman

Illinois

Mark Gawedzinski*

John Senger*

Illinois Tollway

Max Barry*

Tom Wilson*

Iowa

Ashley Buss*

Michigan

Andre Clover

Robert Green*

Tyler Hunt*

Kevin Kennedy

Minnesota

Emil Bautista

Melissa Cole

Jerry Geib*, MnDOT contact

Eddie Johnson

Clark Moe

Joseph Podolsky

Joel Ullring*, chair

Michael Vrtis

Ben Worel

Tom Zimmerman

Mississippi

Alex Middleton*

Heath Patterson*

Missouri

Paul Denkler

Phil Ruffus*

Kaupena Villanueva-Kaeo

Montana

DJ Berg*

Oak Metcalfe*

Miles Yerger

Nebraska

Mike Mattison

Tom Renninger*

North Dakota

Amy Beise

Curt Dunn

Bryon Fuchs*

Aaron Perez

Stephanie Weigel*

Wisconsin

Haluk Sinan Coban*

Pete Kemp*

Minnesota LRRB

Phillip Schmalz*



* indicates voting agency member

Preventive Maintenance Associate Membership

Riaz Ahmad, iENGINEERING Corporation
Allen Akowicz, Pacific Geosource
Başak Bektaş, Minnesota State University - Mankato
Thomas Bennert, Rutgers University
Robert Betsold, All States Material Group
Rod Birdsall, All States Material Group
Andrea Blanchette, Terracon
Brandon Brever, Minnesota Asphalt Pavement Association (MAPA)
Daron Brown, Expanded Shale, Clay and Slate Institute
Douglas Carlson, Liberty Tire Recycling
Bouzid Choubane, Michigan State University
Eshan Dave, University of New Hampshire
Jolee Dominowski, Dow Chemical
Sattar Dorafshan, University of North Dakota
Matheus Dorneles De Mello, Dow Chemical
Bryan Downing, Caterpillar
Colin Durante, Pavement Technologies, Inc
Michael Durante, Pavement Technologies, Inc.
Tyler Eckenrode, Flint Hills Resources
Judith Espinosa Perez, Dow Chemical
Michael Freisthler, Bio-Based Spray Systems
Rouzbeh Ghabchi, South Dakota State University

Jonathan Groeger, iENGINEERING Corporation
Andrew Hanz, Mathy Construction
Katie Hasslett, HRG Lab
Majeed Hayat, Marquette University
Jialuo He, TriDurLE (Washington State University)
Dale Heglund, North Dakota State University
Ken Holton, Pavement Technologies, Inc
Paul Imbrock, Indiana Soybean Alliance
Candice Kohn, Pacific Geosource
Fabricio Leiva, Pacific Geosource
Madeline Lilly, Indiana Soybean Alliance
Danial Mirzaiyanrajeh, Solmax
Miguel Montoya Rodriguez, University of Texas-El Paso (UTEP)
Kenneth Nunley, Expanded Shale, Clay and Slate Institute
Chibuike Ogbo, Terracon
Eric Olson, Solmax
Buzz Powell, National Center for Asphalt Technology (NCAT)
Farhad Reza, Minnesota State University - Mankato
Timo Saarenketo, Roadscanners, USA
Dan Swiertz, Asphalt Materials, Inc.
Brett Towns, Tricor Refining
Greg Vavra, South Dakota State's Local Transportation Program
Baolin Wan, Marquette University
Feng Wang, Texas State University
Dan Wegman, Braun Intertec
R. Chris William, Iowa State University

Preventive Maintenance Projects

NRRA Spray on Rejuvenator Synthesis	WSB
Concrete Pavement Restoration (CPR) for BCOA	WSB
Service Life Enhancement of Substrates Overlaid with Thin Overlays	WSB
Spray on Rejuvenator Test Sections	NCAT - 100k
Bio-material Maintenance Treatments	Iowa State
Thinlays as a PM Treatment	Terracon
Hot rubber seal coating to survive wet and frozen environments	MTU
Materials-Based Methods to Improve Rumble Strip Durability	Asphalt Materials
Use of Recycled Materials in Pavement Preservation	Auburn University
Pavement preservation approaches for lightly surfaced roadways	SRF

Rigid Agency Membership

Caltrans

Reimond Garcia
Allen King
David Lim
Leo Mahserelli*
Dulce Rufino Feldman*
Hamed Sadati

FHWA

Peter Eakman

Illinois

James Krstulovich*
Charles Wienrank*

Michigan

Chris Byrum*
Timothy Stallard*

NRRA National Road
Research Alliance

Iowa

Chris Brakke*

Illinois Tollway

Jay Behnke
Dan Gancarz*
Jake Sumeraj*

Minnesota

Emil Bautista
Tom Burnham, Chair
Bernard Izevbekhai*
Maria Masten*
Tom Nordstrom
Joseph Podolsky
Curt Turgeon
Michael Wallace
Ben Worel

Mississippi

Alex Middleton*
Tucker Stafford*
Giffin Sullivan

Missouri

Brett Trautman*

Montana

Wes Dess
Oak Metcalfe*
Matt Needham*

Nebraska

Bruce Barrett*
Lieska Halsey
Wally Heyen*
Brandon Varilek

North Dakota

Amy Beise
Brian Bennes
Matt Luger
TJ Murphy*

Wisconsin

Peter Kemp*
Tirupan Mandal*



* indicates voting agency member

Rigid Associate Membership

Riaz Ahmad, iENGINEERING Corporation
Aritria Banerjee, South Dakota State University
Manik Barman, University of Minnesota - Duluth
Fatih Bektaş, Minnesota State University - Mankato
Andrea Blanchette, Terracon
Daron Brown, Expanded Shale, Clay and Slate Institute
Adam Carmichael, Infrasense
Bouzid Choubane, Michigan State University
John Cunningham, Aggregate & Ready Mix Association of Minnesota
Jonathan Davis, Uberbinder
Igor De la Varga, CarbonCure
Glenn Engstrom, Aggregate Ready Mix of Minnesota
Alf Gardiner, Braun Intertec
Daba Gedafa, University of North Dakota
Jonathan Groeger, iENGINEERING Corporation
Majeed Hayat, Marquette University
Jake Hiller, Michigan Tech Transportation Institute
Paul Imbrock, Indiana Soybean Alliance
Bill Jin, Michigan State University
Rita Lederle, University of St. Thomas
Jessica Levin, Dow Chemical
Madeline Lilly, Indiana Soybean Alliance
Angel Mateos, University of California Pavement Research Center
Kevin W. McMullen, Wisconsin Concrete Pavement Association

Danial Mirzaiyanrajeh, Solmax
Sean Monkman, CarbonCure
Evan Monroe, Topcon Positioning Systems
Somayeh Nassiri, University of California - Davis
Soheil Nazarian, Center for Transportation Infrastructure Systems (UTEP)
Kenneth Nunley, Expanded Shale, Clay and Slate Institute
Matthew Offenber, Owens Corning
Chibuike Ogbo, Terracon
Eric Olson, Solmax
Hadi Rashidi, National Stone Sand and Gravel Association (NSSGA)
Farhad Reza, Minnesota State University - Mankato
Nick Schaefer, Surface Systems and Instruments, Inc.
Xianming Shi, Ph.D., TriDurLE (Washington State University)
Xijun Shi, Texas State University
Jackie Spoor, Wisconsin Concrete Pavement Association
Mike Taylor, Surface Tech
Peter Taylor, Iowa State University
Paul Tennis, Portland Cement Associate
Cesar Tirado, University of Texas-El Paso (UTEP)
Derek Tompkins, American Engineering Testing
Anthony Torres, Texas State University
Julie Vandebossche, University of Pittsburgh
Baolin Wan, Marquette University
Hao Wang, Center for Advanced Infrastructure and Transportation (CAIT), Rutgers University
Leif Wathne, Iowa State University
James Wilde, Texas State University
Michelle Wilson, Portland Cement Association
Hao Yin, Horizon Engineering Consulting

Rigid Projects

Just funded - Concrete Sustainability / Cement Alternatives
(Research / Lab Testing / Material Selection)

Automated 3DGPR Analysis for Concrete Pavement Evaluation	Infrasense
Blending of Higher Strength Aggregates with Recycled Concrete and Marginal Aggregates to Improve Concrete Properties	St Thomas
Compacted Concrete Pavement Construction (not in construction) - \$50K original	Missouri DOT Hired University
Concrete Early Opening Strength to Traffic	UofPitt
Construction Report for Jointless FRC Roundabout in Minnesota	Iowa State
Engineered Dowel and Tie Bars combined with LTPP SPS-2 Determination of Causes for Cracking Over Dowel Bars	ERES Consulting
Enhanced Entrained Air Void System Characterization for Durable Highway Concrete	TSU
Fiber Reinforced Concrete Pavements	UMD
Incorporate Joint Faulting Model Into BCOA-ME	University of Pittsburg
Optimizing the Concrete Mix Components for Contractors	Iowa State
Partial Depth Repair	Braun Inertec
Pavement-Specific Structural Synthetic Fibers	UMD
Performance of Concrete Overlays over Full Depth Reclamation (FDR)	ARM
Reducing Embodied Carbon with Mineral-Blended Polymeric Microspheres	CP Tech Center
Repair of Joint Associated Distress Pavements	Iowa State
The Use of Alternative Cementitious Materials in Concrete Pavements	APT - NCE
Use of Alternative Pozzolanic Materials Towards Reducing Cement Content in Concrete Pavements	Nichols Consulting / APT
Use of Carbon Dioxide for Sustainable and Resilient Concrete Pavements	Iowa State
Design and Performance of Concrete Unbonded Overlays	SRF
Repair of Joint Associated Distress Pavements	SRF
Surface Characteristics of Diamond Ground PCC Surfaces	SRF
Partial Depth Repairs of Concrete	SRF

Intelligent Construction Technology Agency Membership

Caltrans

Imad Basheer
Deepak Maskey*
Ragu Thangavelautham*

FHWA

Stephen Cooper
Peter Eakman
Chu Wei

Georgia**

John Hancock*
Jacob Walker*

Illinois

Brian Hill*
Heather Shoup*

Illinois Tollway

Signe Reichelt*
Supraja Reddy
Cindy Williams*

Iowa

Chris Brakke*
Jeff DeVries*

Michigan

Jason Clark*
Lindsey Renner*

Nebraska

Lieska Halsey
Wally Heyen

Minnesota

Emil Bautista
Rebecca Embacher*
Shongtao Dai
Kyle Hoegh, Chair*
Joseph Podolsky
Jason Richter
Curt Turgeon
Dave Van Deusen
Raul Velasquez
Ben Worel
Eyoab Zegeye Teshale

Mississippi

Alex Middleton

Wisconsin

Drew Kottke*

Missouri

Jacob Graessle*
Jen Harper
Dan Oesch
Jonathan Varner*

New York**

Edward Collins*
Brett Dean*
Michael Heim*

North Dakota

Amy Beise*
David Bruins
Curt Dunn*
Nathan Haaland
Darin Lindblom
Carey Schreiner

Intelligent Construction Technology Associate Membership

Riaz Ahmad, iENGINEERING Corporation
Paul Angerhofer, MOBA Corporation
Aritria Banerjee, South Dakota State University
Eric Baker, Astec Industries
Thomas Bennert, Rutgers University
Brent Bergman, Surface Systems and Instruments, Inc. (SSI)
Andrea Blanchette, Terracon
Brandon Brever, Minnesota Asphalt Paving Association
George Chang, The Transtec Group
Joe Charlesworth, Highway Data Systems (UK)
Ruairi Charlesworth, Highway Data Systems (UK)
Ervin Dukatz, Flyereld Consulting
Jonathan Fischer, Owens Corning
David Ford, Pavement Recycling Systems, Inc.
Kevin Garcia, Trimble
Rouzbeh Ghabchi, South Dakota State University
Bill Hall, Resource Recycling Systems
Adam Hand, University of Nevada - Reno
Majeed Hayat, Marquette University
Daniel Jones, Earth Science Systems, LLC
Kyle Klasen, WSB
Joe Korzilius, SRF Consulting
Tim Kowalski, Wirtgen Group
Devin Laubham, Trimble

Todd Mansell, Caterpillar Global Paving
Ken Maser, Infrasense
Donald Matthews, Pavement Recycling Systems, Inc.
Danial Mirzaiyanrajeh, Solmax
Evan Monroe, Topcon Positioning Systems
Brian Nagel, Caterpillar Global Paving
Laikram Narsingh, Wirtgen Group
Soheil Nazarian, University of Texas at El Paso
Charles Oden, Earth Science Systems, LLC
Chibuike Ogbo, Terracon
Eric Olson, Solmax
Matt Oman, Mathy Construction
Jim Preston, Topcon Positioning Systems
Hadi Rashidi, National Stone Sand and Gravel Association (NSSGA)
Farhad Reza, Minnesota State University - Mankato
Roger Roberts, GSSI
Mohammad Sabouri, Braun Intertec
Baris Salman, Syracuse University
Steve Santa Cruz, Surface Tech
Nick Schaefer, Surface Systems and Instruments, Inc. (SSI)
Dan Schellhammer, Midstate Reclamation & Trucking, Inc.
Dave Shelstad, MOBA
Chris Trboyevich, SRF Consulting
Baolin Wan, Marquette University
Dan Wegman, Braun Intertec
Brett Williams, National Asphalt Pavement Association (NAPA)

Intelligent Construction Projects

Levels 3-4 Intelligent Compaction Measurement Values (ICMV) for Soils Subgrade/Aggregate Subbase Compaction	Transtec Group
Support Importing, Viewing and Analysis of Dielectric Constant Data in Veta (paid by Veta pooled fund)	Transtec Group
HD and VHD Seismic Approaches for Roadway Evaluation	Park Consulting
Asphalt Real Time Smoothness (ARTS) for Asphalt Paving	Transtec Group
Veta Web and Veta MDMS Standardized Platform	Transtec Group
InfoPAVE MnROAD Database Support and Development	i-Engineering
Effective Use of Traffic Speed Deflectometer for Network-based and Project-based Applications	UTEP
Establishing Applicability of NDT Methods for Project-Level Evaluation	UTEP
E-Ticketing	SRF

Also shown in the Rigid List

Automated 3DGPR Analysis for Concrete Pavement Evaluation

Veta Software TPF-5(334) now NRRRA

- HMA Rolling Patterns
- Paver Operations / IR Temperature Bar
- 3D GPR / Rolling Density Meter



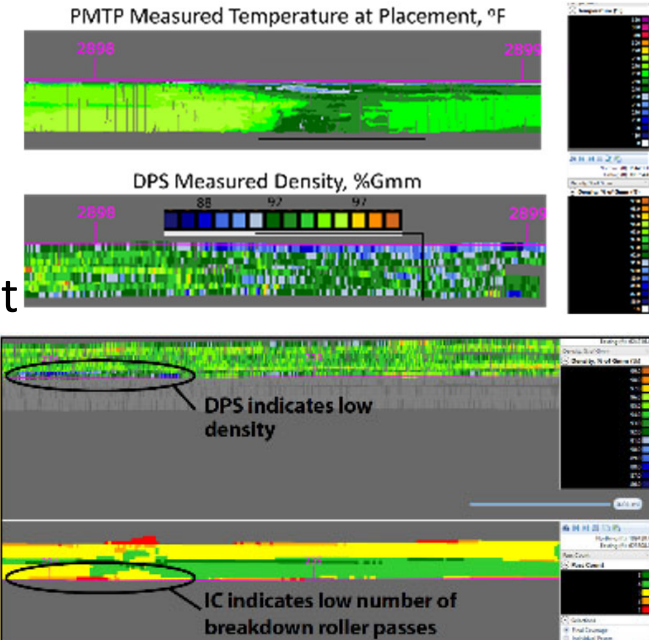
DPS National Pooled Fund Program



DPS Contacts - Materials & Road
Research - MnDOT
www.dot.state.mn.us

Continuous Asphalt Mixture Compaction Assessment Using Density Profiling System (DPS) [TPF-5(443)]

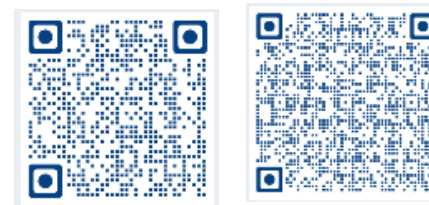
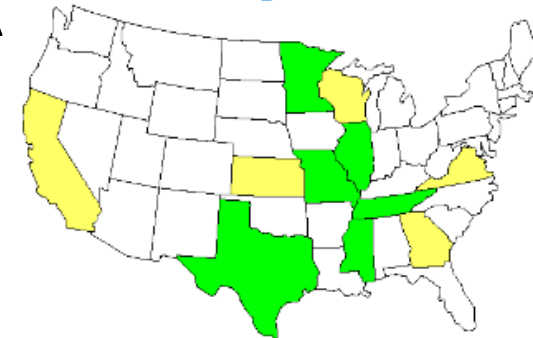
- **Objective:** Use the DPS method to improve asphalt pavement density
 - Increased coverage and comprehensiveness of assessment
 - Timely information to improve construction process
 - Reduce coring
- **Lead Agency:** MnDOT
 - Contact: Kyle Hoegh, kyle.hoegh@state.mn.us (MnDOT)
- **Committed agencies:** MN, FHWA, GA, ID, MD, ME, MO, MS, ND, NY, OH, PADOT, UT, WA, WI
- **Commitment level:** \$25K/year



Continuous Bituminous Pavement Stripping Assessment Through Non-Destructive testing

TPF-5(504): Continuous Bituminous Pavement Stripping Assessment Through Non-Destructive testing (4 years)

- **Objective:** Develop testing and analysis procedures for automatic detection and rating of stripped section for project and network level pavement evaluations
- **Lead Agency:** MnDOT
 - Contact: Eyoab Zegeye, eyoab.zegeye@state.mn.us (MNDOT)
- **Committed agencies:** MN, IL, MO, TN, MS, TX, GA & FHWA
- **Pending:** CA, KS, WI, VA and IN
- **100% SP&R Approval:** Approved
- **Commitment level:** \$25K/year



SCAN US

2024 MnROAD Construction

Completed in 2022

- 39 Mainline Sections - NRRRA supported research

Completed in 2023

- 4 LVR Sections - LRRB HMA Reflective Cracking Study
- 2 LVR Sections – NRRRA and NSF Water Repellency Study



2024 Construction

- 10 Mainline Sections focused on Concrete Sustainability (matches 16 test sections built in 2022 – Rigid Team Lead)
 - Partnerships needed for the cement alternative materials
 - RPF for the research
 - Sampling and Testing
 - MnROAD Staff Monitor performance and instrumentation
- 12 LVR service road - HMA Stripping Calibration Sections – Pooled Fund
- MnROAD: 50-person conference room addition

2024 NRRA Pavement Conference

April 30 - May 1, 2024

- Shoreview Community Center (Minneapolis/St Paul)
- NRRA implementation Focus
 - April 30, 2024
 - General Session
 - Team Lead Sessions on implementation of completed NRRA projects
 - May 1, 2024
 - Morning - Team Lead Updates and project highlight
 - Afternoon – MnROAD Open house / demos / meetings / open to ideas

NRRA Technical Teams are developing the agenda for the 1 ½ day conference and different options for the 2nd day at MnROAD.

Other Partnerships / Ways to get involved

Pavement Preservation – Phase III



- MnDOT Lead State
- Solicitation 1581 - <https://pooledfund.org/Details/Solicitation/1581>

National Road Research Alliance NRRRA

- MnDOT Lead State
- TPF-5(466) - <https://pooledfund.org/Details/Study/693>



Additive Group Study

- NCAT lead pooled fund / NRRRA & MnROAD Ties
- TPF-5(469)- <https://pooledfund.org/Details/Study/696>



DPS National Pooled Fund Program

- MnDOT lead State (15 agencies)
- TPF-5(443)- <https://pooledfund.org/Details/Study/667>



Continuous Bituminous Pavement Stripping Assessment Through Non-destructive Testing

- MnDOT lead State (8 agencies)
- TPF-5(504)- <https://pooledfund.org/Details/Study/733>



NRRA - Request for Proposals (coming out soon)

Flexible - Perpetual Pavements in Wet Freeze Climate

- Supported with MnROAD and Wisconsin test sections

Flexible - Recycled Binder Availability

- Efforts to understand how recycled binders effect new HMA

Flexible – Balanced Mix Design

- NRRA supported second phase of research

Rigid - Concrete Sustainability / Cement Alternatives

- Supported with 2024 MnROAD test sections

Hot Future Topics – NRRRA Flexibility to React

1. Green Pavements
2. Intelligent Systems
3. Innovative Materials

1. Sustainability/ EPD
2. Database/AI
3. Collaborations/ Partnerships

1. What do you think?
2. What is the future?



Thank You - Ben

Thank You for Attending

See you again in
February!!

