

IN THE KNOW?

NDOT, in partnership with FHWA, fund many research projects every year with topics in four different focus groups:



Materials, Pavement, Maintenance and Construction



Roadway, Hydraulics, and Environmental

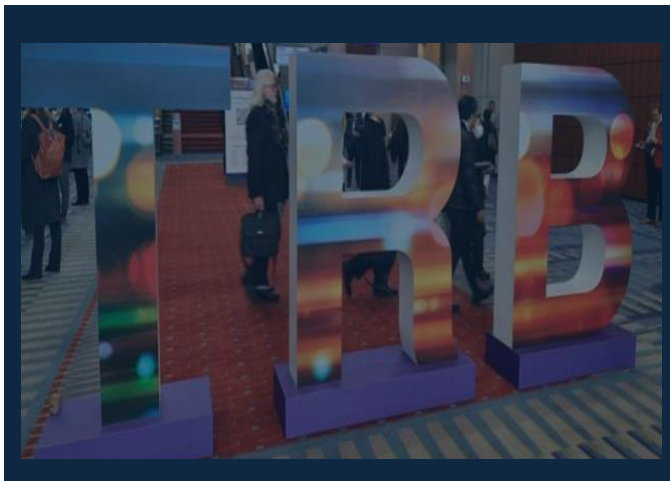


Traffic, Safety, Planning, and Technology Structures and Geotechnical

Every year the Department sponsor Transportation Research Board (TRB) to best serve the activities of interest to the entire transportation community.

TRB

TRANSPORTATION RESEARCH BOARD



Nebraska Department of Transportation Funded Projects Presented at The 2025 Transportation Research Board

**10 PROJECTS
WERE
HIGHLIGHTED**

The transportation research community consists of numerous partnerships to aid in the conduct of research and the implementation of technologies and innovations. The Federal Highway Administration (FHWA), the State Departments of Transportation (DOTs), and the National Academies of Sciences, Engineering, and Medicine (NASEM) are among these partners, who work closely in many facets of the national research program.

The TRB's mission is to provide independent analysis and advice on transportation issues.

NEBRASKA

Good Life. Great Journey.

DEPARTMENT OF TRANSPORTATION



U.S. Department of Transportation
Federal Highway Administration

Nathan Huynh and Li Zhao
University of Nebraska – Lincoln



Nathan Huynh

Framework for Quantifying Benefits to Disadvantaged Communities: Application to Nebraska’s National Electric Vehicle Infrastructure (NEVI) Plan

NDOT: Curtis Nosal



Li Zhao

Assessment of Truck Parking Demand and Safety During Normal and Severe Weather Conditions in Nebraska

NDOT: Ryan Huff and Jarrod Walker

Li Zhao and Aemal Khattak
University of Nebraska - Lincoln



Aemal Khattak

Guidance for Left-Turn Flashing Yellow Arrow (FYA) Implementation in Nebraska

NDOT: Alan Swanson and Don Butler

Jamilla Teixeira
University of Nebraska - Lincoln

Effect of Antioxidant Additives and Recycling Agents on Performance of Asphalt Binders and Mixtures—Phase I

NDOT: Robert Rea

Asphalt Binder Laboratory Short-Term Aging—Phase II

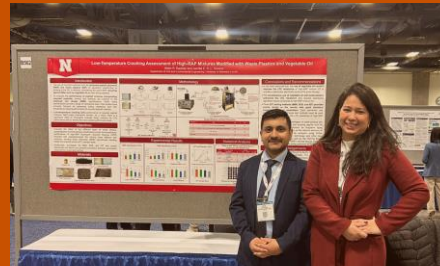
NDOT: Robert Rea

The Use of Recycled Plastic in Asphalt Pavements: Feasibility Study

NDOT: Robert Rea



Jamilla Teixeira



WANT TO GET INVOLVED?
NDOT.RESEARCH@NEBRASKA.GOV



George Morcouc

George Morcouc and Jiong Hu
University of Nebraska - Lincoln

Low –Cement Concrete Mixture for Bridge Deck and Rails

NDOT: Wally Heyen and Fouad Jaber



Jiong Hu

Ultra-High-Performance Concrete (UHPC) for Bridge Deck Overlay and Structural Deck Repair

NDOT: Fouad Jaber and Wally Heyen

Michael Perez
Auburn University



Michael Perez

Evaluation of NDOT’s Sediment Barrier Practices Using Performance Data

NDOT: Ron Poe



Ronald Faller

Ronald Faller, Scott Rosenbaugh, and Robert Bielenberg

University of Nebraska – Lincoln

Midwest Roadside Safety Facility



Scott Rosenbaugh

Development of a Post-to-Deck Connection for a TL-4 Steel-Tube Bridge Rail



Robert Bielenberg

Poster

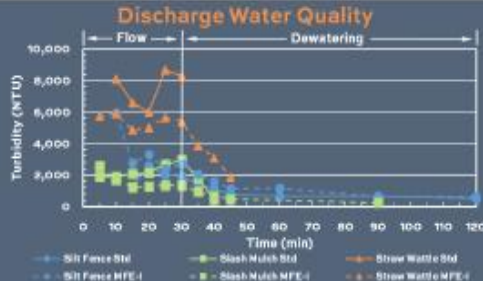
Large-Scale Performance Evaluation of Sustainable Sediment Barrier Installations

Brian G. Roche, E.I., Michael A. Perez, Ph.D., P.E., CPESC, Wesley Donald, Ph.D., & J. Blake Whitman, Ph.D., P.E., CPESC



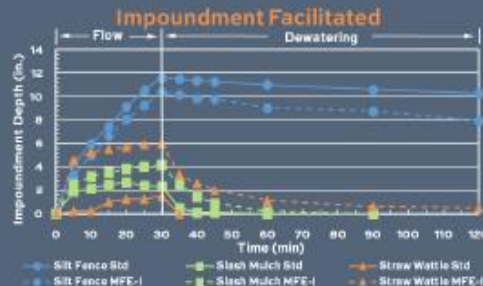
Research Objectives

- Little research on alternative, more sustainable sediment barriers to silt fence (SF)
- Evaluate Nebraska DOT standard wattle (SW) and slash mulch berm (SMB) installations
 - To determine if feasible as sediment barrier practices
- Develop modifications resulting in most feasible & effective installations (MFE-I)
- Compare results of testing to silt fence (SF) under same conditions



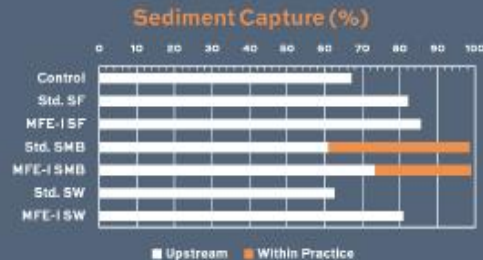
Background

- Silt fence are typically composed of materials that can be harmful to the environment
 - Emissions during production of geotextiles and metal
 - Risk of microplastic pollution if silt fence left on site
- Sediment barrier performance in the past has been shown to be due to sedimentation within impoundments formed upstream
 - Primarily has been on silt fence
- Research on wattles has primarily been in ditch check applications
- No research on improving slash mulch berm sediment barrier installations



Methodology

- Nebraska flow & sediment introduction conditions:
 - Sediment: 26.6 lb/min
 - Flow: 0.086 ft³/s
- Measured: impoundment, flow-through rates, water quality, & sediment capture
- Modifications were developed based on results



Conclusions

- Testing of slash mulch berms and wattles in sediment barrier conditions indicate that they are viable alternatives to silt fence
 - Despite facilitating less impoundment
- Increased compaction of slash mulch berm installations statistically significantly reduced discharge turbidity
- improved discharge water quality
- Increased ground contact of wattle installations led to increased impoundment and sediment capture

Recommendations

- Slash Mulch Berms:**
 - Prioritize if the material is available
 - Compact installation to facilitate impoundment
- Wattles:**
 - Add 6 in. sod staples every foot on both sides of wattle installations
 - Increase joint overlap of wattles from 1 ft to 2 ft
 - Eliminate use of trenching due to undermining risk

Impact

- Development of more sustainable sediment barrier practices can reduce emissions caused by production of plastic-based products such as silt fence
- Improvements to practices can reduce risk of failure & replacement/repair, saving taxpayer funds
- Decreasing discharge turbidity protects waterways and reduces need for mitigation efforts



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Submit a Statement of Need



For more information
visit [Nebraska Department of Transportation Research Website](https://www.transportation.gov/research)