Live Webinar Series

THE ROAD TO 100% TIRE CIRCULARITY:
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Using RMA to Advance Sustainability and Durability in Roadways in the Midwest

January 21, 2026

Host:

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Panelists:

- **Dr. Punyaslok Rath**, Assistant Research Professor, Department of Civil and Environmental Engineering, University of Missouri-Columbia
- **Dr. Zhanping You**, Distinguished Professor and Director, Michigan Tech Transportation Institute, Michigan Technological University
- **Kirsten Clemens,** Scrap Tire Coordinator, Michigan Department of Environment, Great Lakes and Energy
- **John Lavallee**, Operations Manager, S.T.A.T.E. Testing, LLC

Key Takeaways

The Midwest faces distinct pavement challenges: extreme cold and heat, freeze-thaw cycles, and heavy industrial traffic. Rubber-modified asphalt (RMA) addresses these conditions through superior cold weather performance that keeps pavements flexible rather than brittle, cost-effectiveness compared to polymer alternatives, and extended service life that reduces maintenance burdens. Success across the region demonstrates multiple pathways:

- Missouri's engineering-driven specifications, see the Missouri DoT Specification Report and RMA SOK for details.
- Michigan's grant-funded market development, and
- Illinois Tollway's performance-based procurement.

These examples show that RMA adoption requires cooperation between agencies willing to issue specifications, contractors ready to produce mixes, and researchers providing local performance data for risk mitigation.

Midwest-Specific Benefits

Superior Cold Weather Performance

- Rubber-modified asphalt excels in cold weather because rubber keeps pavements flexible when conventional asphalt becomes stiff and brittle. This flexibility allows pavements to bend rather than crack under temperature stress from harsh freeze-thaw cycles. Laboratory testing confirms

rubber mixes absorb more energy before cracking and resist crack growth better than conventional mixes. Field observations demonstrate the real-world impact: after multiple winters, rubber asphalt sections in counties like Bay County (Michigan) show minimal or no cracking even after four to five years of service. For Midwest counties and local agencies managing extensive road networks with limited budgets this winter, durability provides substantial value and cost-savings where conventional pavements would require earlier intervention.

Cost-Effectiveness and Return on Investment

- In low-bid environments, economics drive adoption. Dry process RMA technologies cost several dollars less per ton than polymer-modified asphalt while delivering equivalent performance, creating immediate savings when replacing polymers in heavy traffic applications. Beyond initial cost, life cycle analysis demonstrates RMA benefits through lower maintenance, reduced repair costs, and extended time before rehabilitation. For maintenance applications, rubber-modified chip seal offers highly affordable pavement life extension, particularly valuable for county roads and municipalities managing large networks with limited funding.

Regional Success Stories

Missouri: Engineering-Driven Adoption

- Missouri's RMA adoption grew organically through engineering evidence rather than environmental mandates. The state developed both wet and dry process specifications through sustained cooperation among the DOT, contractors, and University of Missouri researchers.
- Beginning in 2017, laboratory testing demonstrated performance benefits and enabled DOT approval for demonstration sections.
- Multiple field installations followed, generating local performance data on Missouri roads, materials, and weather conditions.
- By 2022-2023, this evidence supported formal specifications. The timeline illustrates that specification development requires patience; DOTs need confidence generated by local data showing how technologies perform under specific conditions.

Michigan: Grant-Funded Market Development

- Michigan Department of Environment, Great Lakes and Energy (EGLE) transformed its tire program from cleaning up stockpiles to genuine market development, funding over 300 lane miles of RMA projects.
- The program strategically targets counties and municipalities, which manage 74% of Michigan's road miles yet face severe budget constraints and deteriorating infrastructure.
- Grant funding enables these agencies to pilot RMA while researchers document performance, building confidence through hands-on experience.
- The results speak clearly: Bay County, Saginaw County, Dickinson County, and multiple other jurisdictions now actively seek RMA projects.
- Michigan has expanded beyond conventional paving to include over 100 miles of rubber-modified chip seal across 11 counties, demonstrating that maintenance-first applications provide cost-effective entry points for resource-limited agencies.

- Michigan also addressed challenges with adoption: contractors will not invest in equipment without demand, while DOTs will not create demand without contractor readiness.
- The state's 2024 STIC grant partnered with the County Road Association to develop specifications, creating a bottom-up pathway to adoption.
- County road commissioners who experienced RMA success through pilot projects became direct advocates to their state association for specification development.
- When state DOTs remain hesitant, this collaborative approach among road owners, county associations, researchers, and DOT creates a pathway from pilot projects to formal specifications.

Illinois Tollway: Performance-Based Leadership

- The Illinois Tollway operates as a performance-based laboratory, recognizing rubber as a polymer equivalent that must meet identical specifications including Hamburg rutting and DCT cracking requirements.
- Their active new technology process enabled dry process RMA to move from literature review through laboratory testing, shoulder trials, and mainline evaluation to full specification approval between 2015 and 2017.
- A 2018 head-to-head comparison placed dry process and terminal blend products side-by-side over 20 miles in each direction, with both performing exceptionally well.
- Contractors have increasingly adopted rubber-modified stone matrix asphalt because it eliminates the flushing problems that create penalties with polymer alternatives—99% of Tollway rubber-modified mixes use SMA.
- The Tollway succeeds by offering contractor choice, demanding equivalent performance, and using DCT testing where rubber demonstrates advantages.

Call Action: What's Next?

Policy Makers

- Allocate funding for demonstration projects and grant programs that enable local agencies to pilot RMA
- Support STIC grants and similar collaborative programs that bring together road owners, researchers, and DOTs to develop specifications
- Position RMA as both an environmental solution and economic development opportunity for regional manufacturing and job creation

DOTs and Municipal Leaders

- Request demonstration sections with local materials and weather conditions to generate performance data for your jurisdiction
- Recognize rubber as a polymer equivalent, requiring the same performance specifications rather than mandating specific materials
- Consider side-by-side test sections comparing rubber-modified to polymer-modified and conventional mixes to document performance differences

- Adapt proven specifications from Missouri, Illinois Tollway, or other regional states rather than starting from scratch

County Road Commissions and Local Agencies

- Explore grant funding opportunities for pilot projects, particularly for maintenance applications like chip seal
- Partner with state universities and research institutions to document pilot project performance
- Advocate for statewide or regional specifications by sharing successful project results with state DOTs and road associations

Contractors and Asphalt Producers

- Participate in demonstration projects with DOTs and researchers to gain hands-on experience with RMA production
- Advocate for specifications that recognize rubber as a polymer equivalent, allowing RMA to compete based on performance rather than material prescription
- Invest in plant equipment when clear ROI opportunities exist, particularly for high-volume projects and polymer replacement applications
- Document cost savings and performance benefits from completed projects to strengthen the business case for broader adoption
- Partner with research institutions for mix design support and quality control guidance, recognizing that rubber is different but not difficult

Civil Engineers and Researchers

- Use balanced mix design testing that evaluates both rutting and cracking performance to demonstrate RMA's cold weather advantages
- Generate local performance data through pilot projects, as DOTs require evidence from their own roads and materials
- Reference the upcoming updated USTMA State of Knowledge report for guidance on quality control procedures and specification development
- Provide risk mitigation for contractors by explaining that rubber is different but not difficult compared to polymer modification

Recyclers

- Work with asphalt producers to meet quality specifications and ensure consistent material supply
- Engage with state environmental agencies about market development funding opportunities for processing infrastructure

Conclusion

The Midwest proves rubber-modified asphalt (RMA) delivers practical solutions for extreme weather and heavy traffic. Success across Missouri, Michigan, and Illinois demonstrates multiple pathways to adoption: engineering-driven specifications, grant-funded market development, and performance-based procurement. The region's experience confirms that cold weather performance, cost-effectiveness, and extended service life address the fundamental challenge of managing extensive road networks with limited budgets. Moving forward requires sustained collaboration among state DOTs, county road

commissions, contractors, researchers, and policymakers to expand specifications, fund demonstration projects, and document performance data across the diverse Midwest climate.

Resources on Rubber-Modified Asphalt

Visit the ELT Knowledge Hub, presented by the Tire Recycling Foundation, for the webinar recording and more resources on this topic, including:

- USTMA Rubber Modified Asphalt State of Knowledge (2021)
- Summary of State Specifications for RMA
- Link to webinar recording: https://tirerecyclingfoundation.org/RMAMarketResource#RMANAT2025Recording

Tire Recycling Foundation Conference:

- Date: May 12-14, 2026
- Location: Denver, Colorado
- Registration: Now Open

Additional Resources

- **ELTs Knowledge Hub:** https://tirerecyclingfoundation.org/marketsresources
- https://tirerecyclingfoundation.org/webinars
- https://www.ustires.org/webinars

Questions or Feedback:

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