



An Introduction to: **Void Reducing Asphalt Membrane (VRAM)**

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Specialty Products Area Manager | April 2025





HERITAGE

CONSTRUCTION + MATERIALS



HERITAGE

CONSTRUCTION + MATERIALS

3,000+ Employees

68
Locations

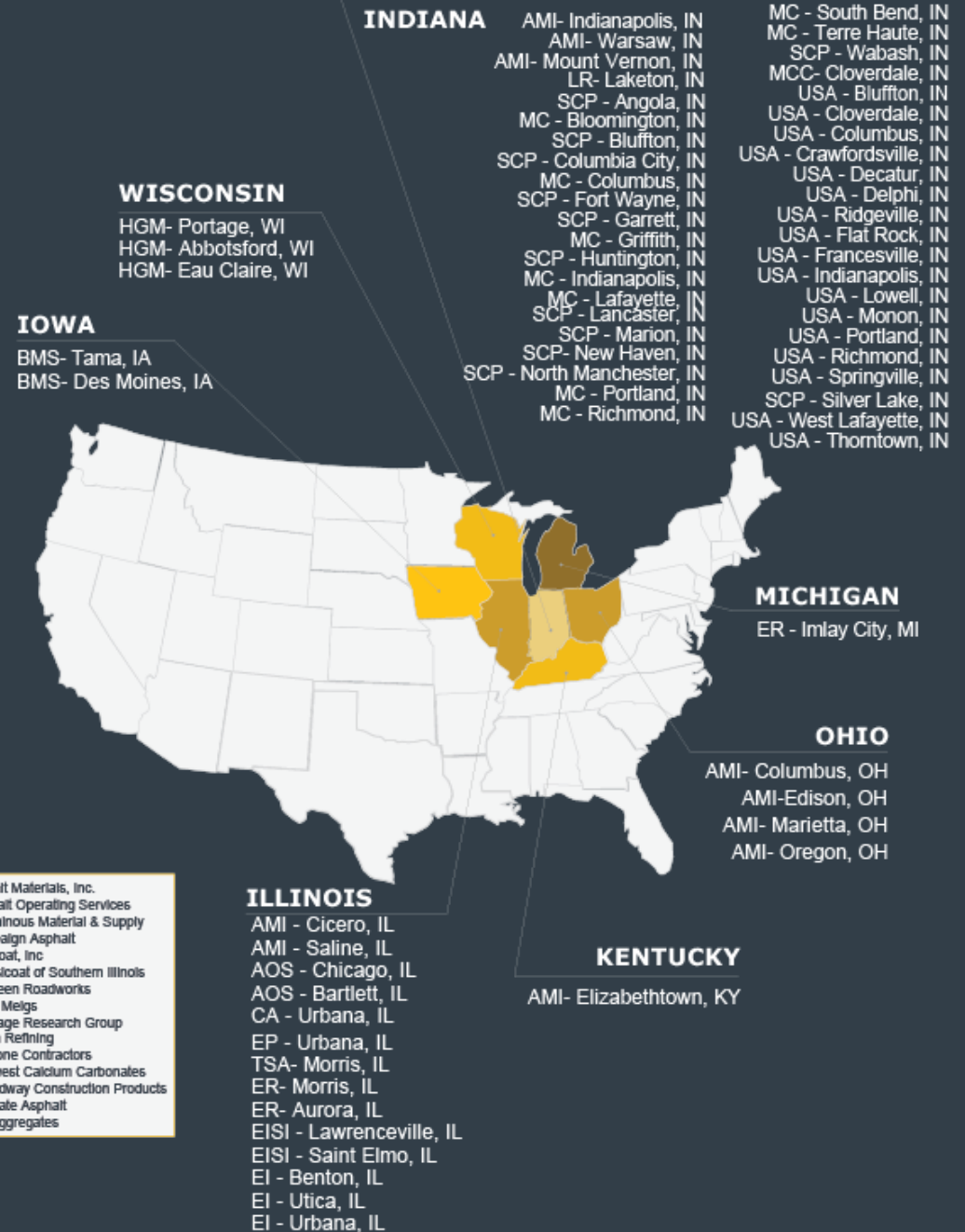
7
States

For more than 65 years, HC+M companies have been an integral part of building roads, bridges and commercial projects across the Midwest. You'd be hard-pressed to find someone who isn't touched by our kind of work every day. From the roads they drive on to the household products they use, we take our impact on people seriously. That's why we never cut corners and give our all for the individuals, families and communities depending on us.

Our Brands



EMULSICOAT, INC.



Longitudinal Joint Improvement Plan

- Early 2000's timeframe
- Illinois DOT recognized need for improving joint performance
- Failure mechanism = Permeability
- **Concept** – How to fill a portion of the voids with an asphalt product from bottom up?
- Heritage proposed the development of a Void Reducing Asphalt Membrane (VRAM)



Falling head permeameter

Terminology

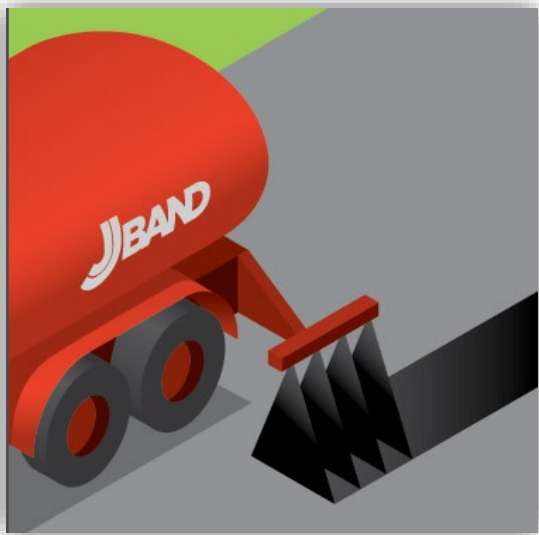
VRAM

Void Reducing
Asphalt Membrane

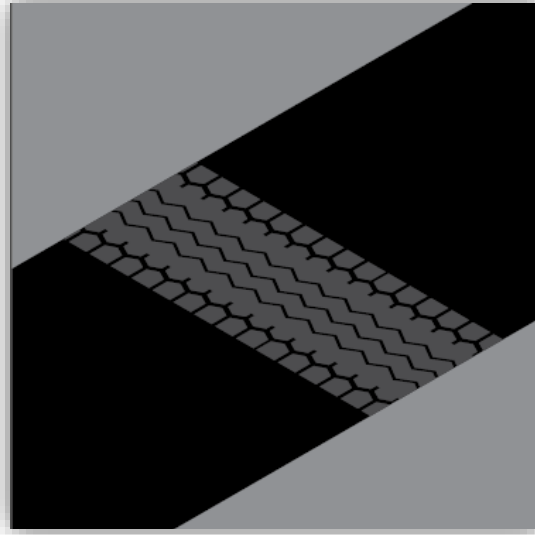
J-Band[®]

Asphalt Materials,
Inc. Trade Name

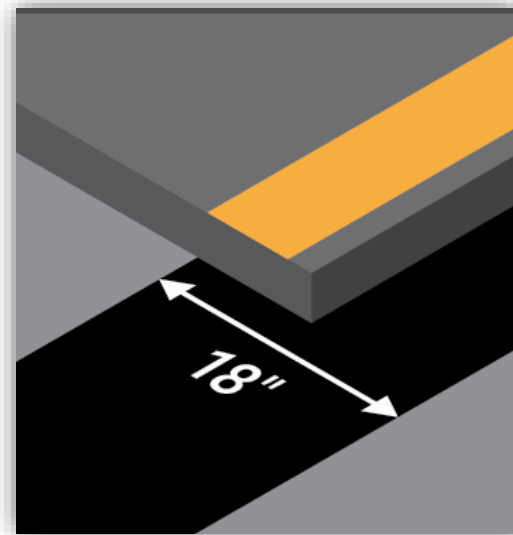
Preserving/Maintaining Centerline Joints At Time of Construction



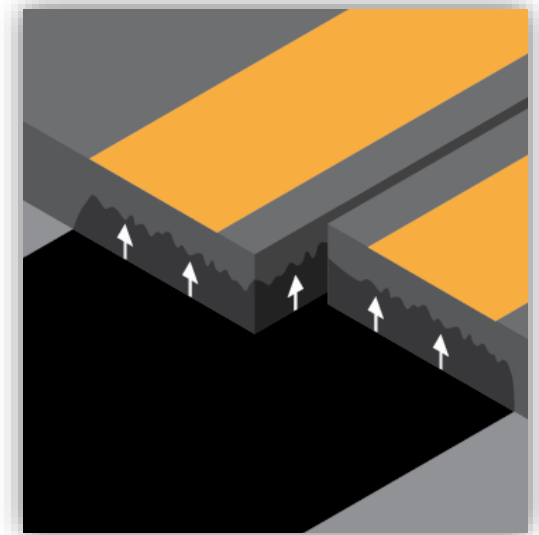
Apply a heavy band of polymer-modified binder in the area where the new paving joint will be placed.



Fast acting, the road is ready for construction traffic, keeping the installation process efficient and traffic flowing.

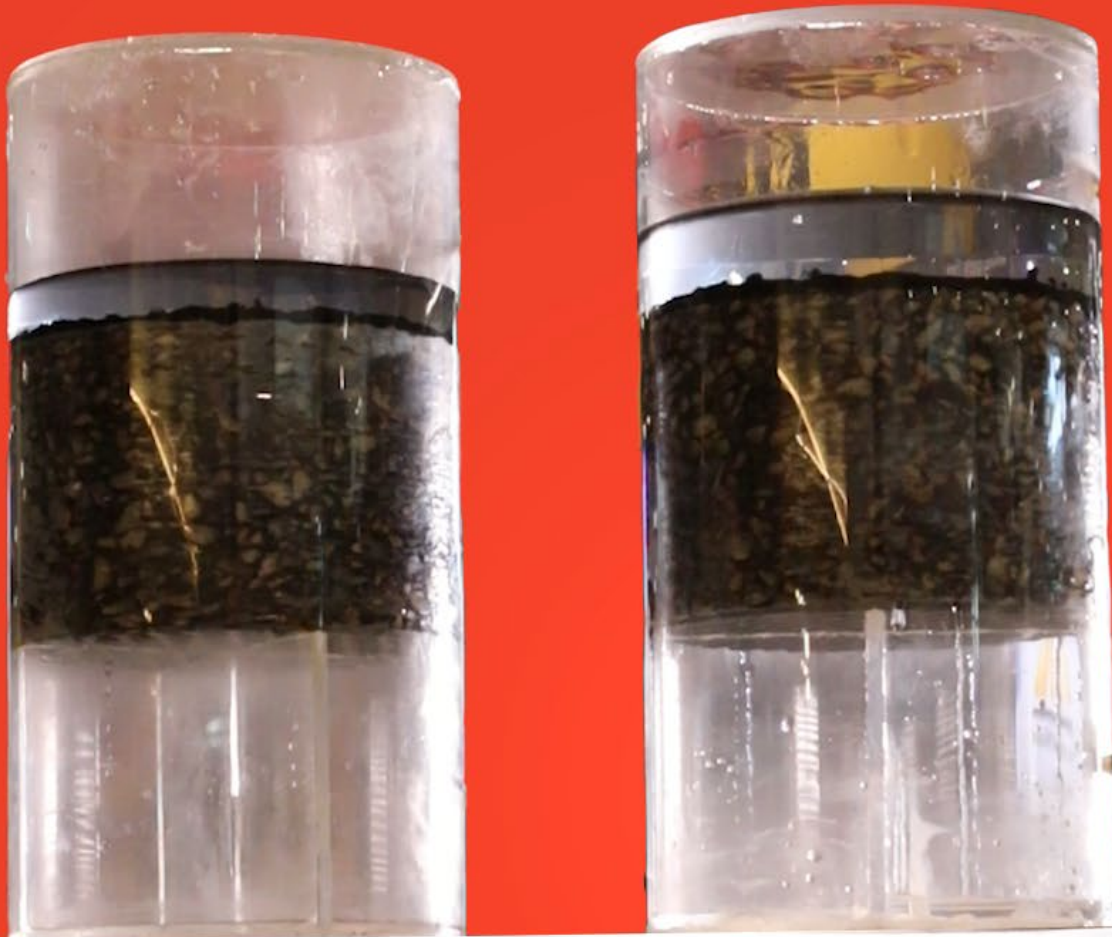


Place the first paving pass over half the width of the band of polymer-modified binder.



Polymer-modified binder migrates into the HMA at the joint.

Water Permeability Demonstration



J-Band

Control

- Time lapse is 6.5 minutes
- Cores built with 9.5mm Coarse-Graded HMA, 12% Air Voids
- Barrier created by VRAM prevents water from permeating
- Proven and reliable!
 - J-Band is a proven solution for more durable longitudinal joints
- This is PRE-PRESERVATION!

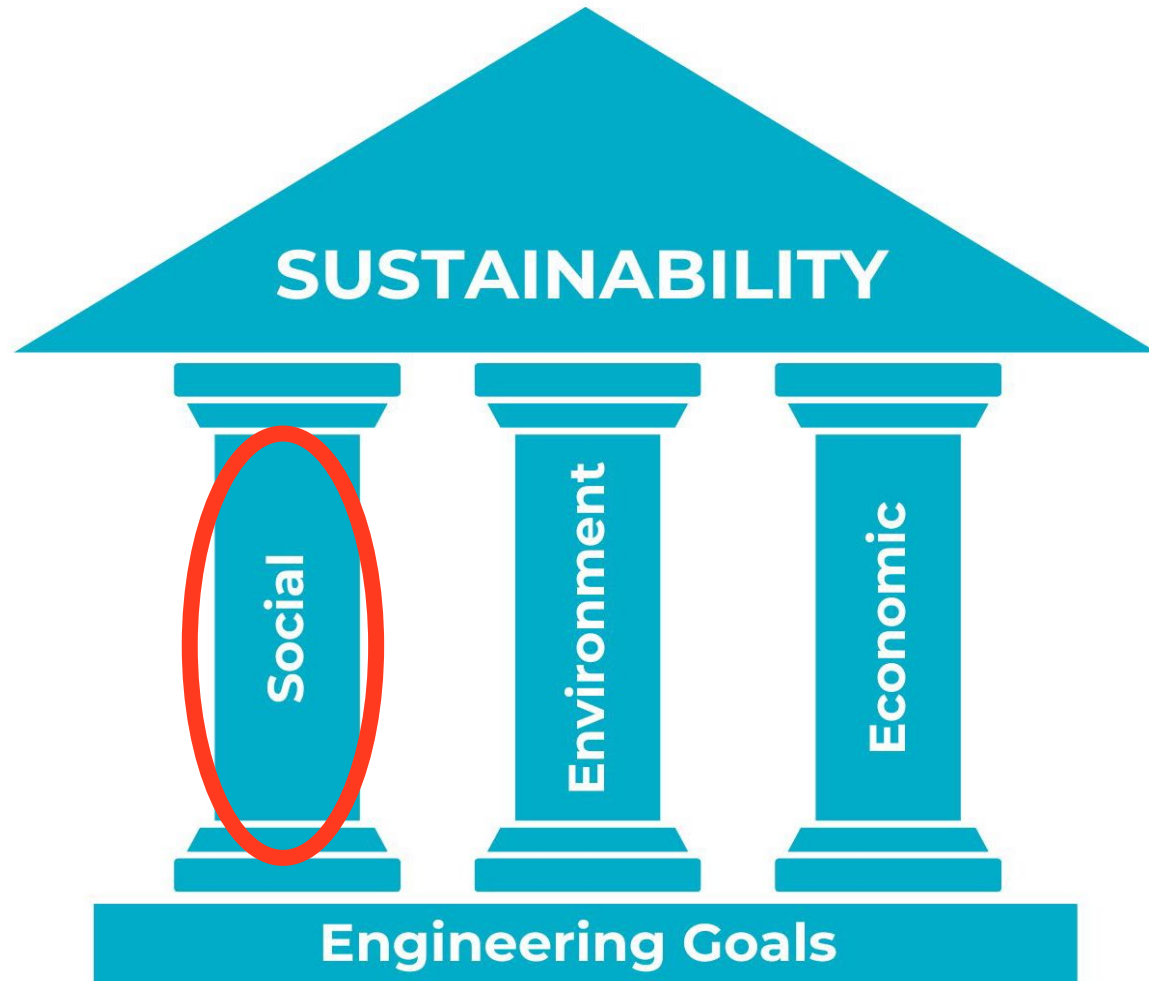


Sustainability

**Social = Safety and
Economics**

The

VRAM - Pillars of Sustainability



Achieve Engineering goals while achieving Sustainability goals



VRAM Under Rumble Strips

- Rumble strips/corrugations
 - Used on an increasing basis for safety (Distracted Driving)
 - Placed in the weakest area of the pavement, centerline joint or outside edge of paving creating early failure
- VRAM under centerline or edge rumble strips to reduce air/water permeability
- Sealed after milled in to reduce water penetration

Quiz Time:

- _____ of fatal crashes are a result of lane or roadway departure.
- _____ of opposing direction crashes occur on undivided 2-lane roads.
- _____ of these crashes involve overtaking (passing) maneuvers.
- _____ of drivers *admitted* to “dozing off” while driving.

Centerline rumble strips reduce head on crashes by as much as _____.

Answer Bank

A 20% B 65% C 75% D 55% E <5%

Rumble Strips Can Help Save Lives

In 2019:

7,389

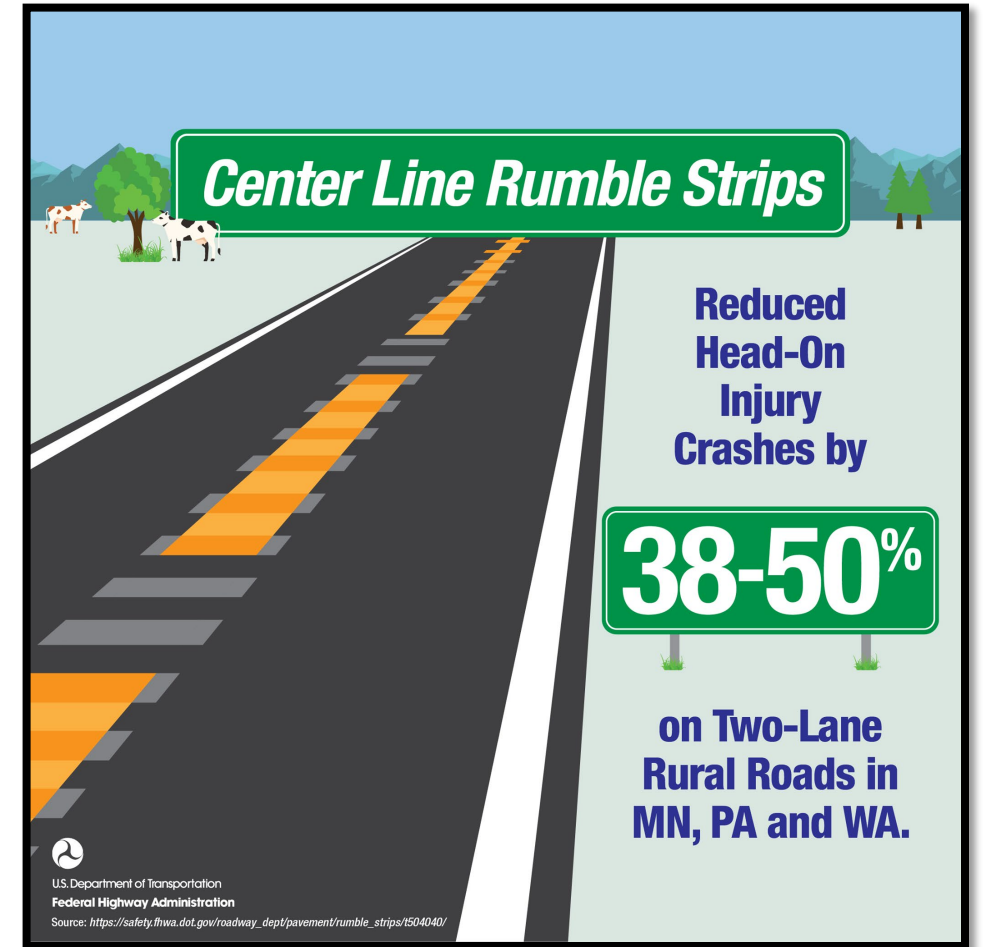
Crashes in left of center accidents in Ohio

160

Fatalities in left of center accidents in Ohio

16,261

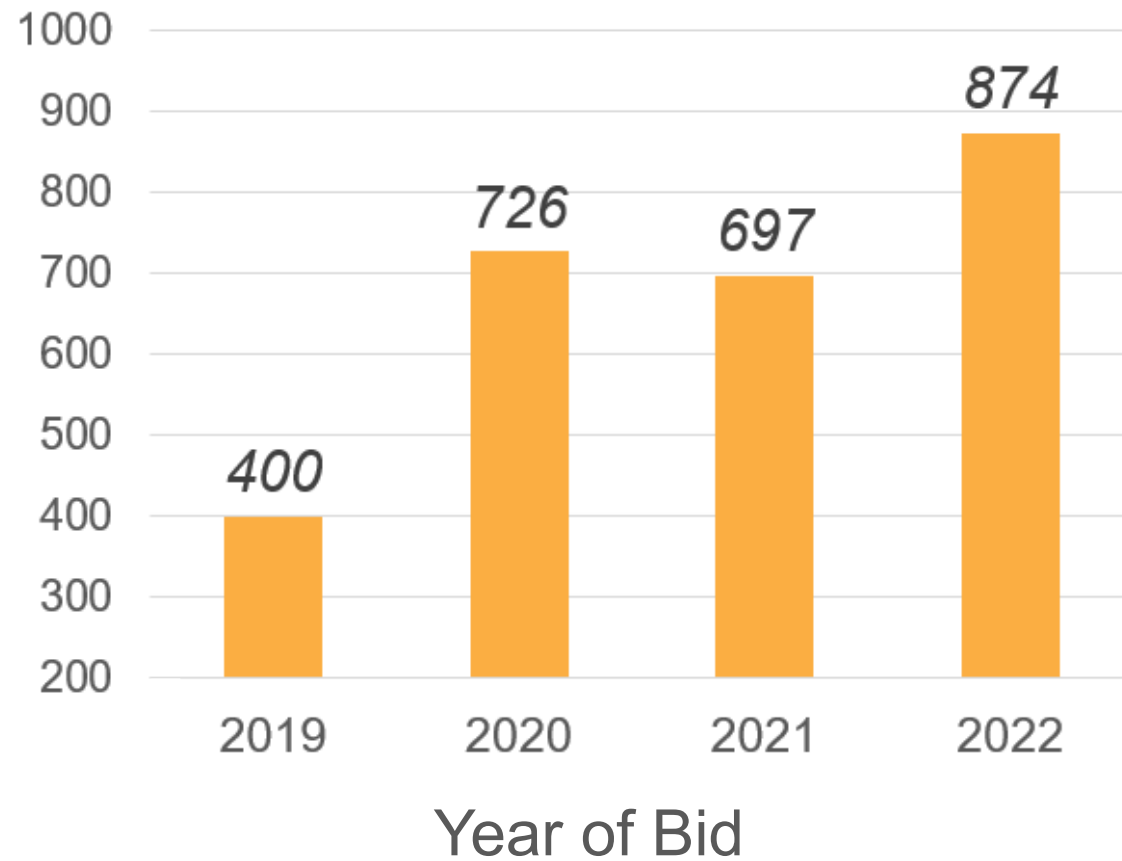
Roadway departure fatalities nationally





Use of CLRS in Wisconsin:

Let Miles, Centerline Only (Includes Sinusoidal)



AGENCY EXPERIENCE: INDIANA - SR 26, Jay Co.

Constructed Nov. 2016
Reviewed Feb. 2024

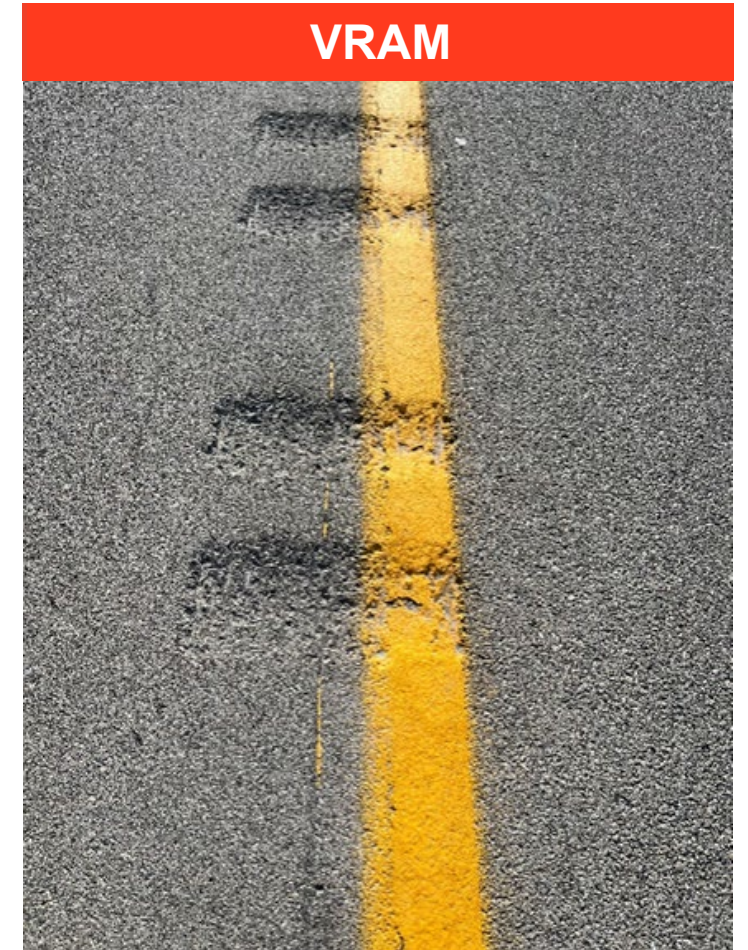
Control

- Cracking – 1/2"
- Some double crack filled

Majority of job crack filled

VRAM

- Minor cracking ~1/8"
- Some crack fill – not needed



AGENCY EXPERIENCE : Wayne Co., New Pittsburg

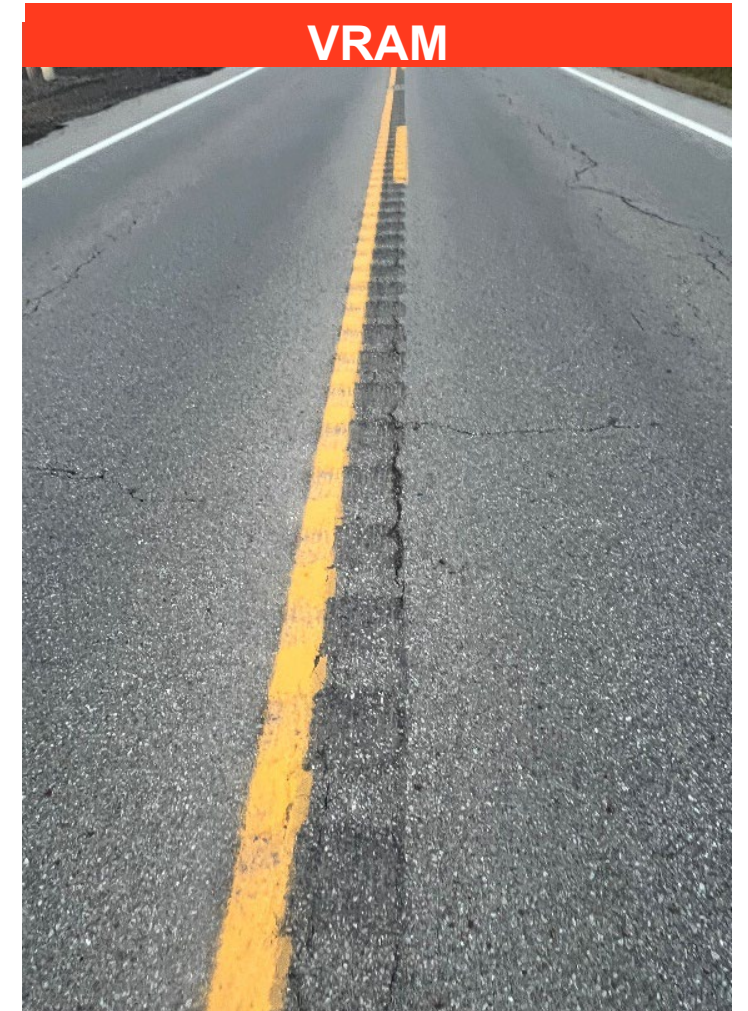
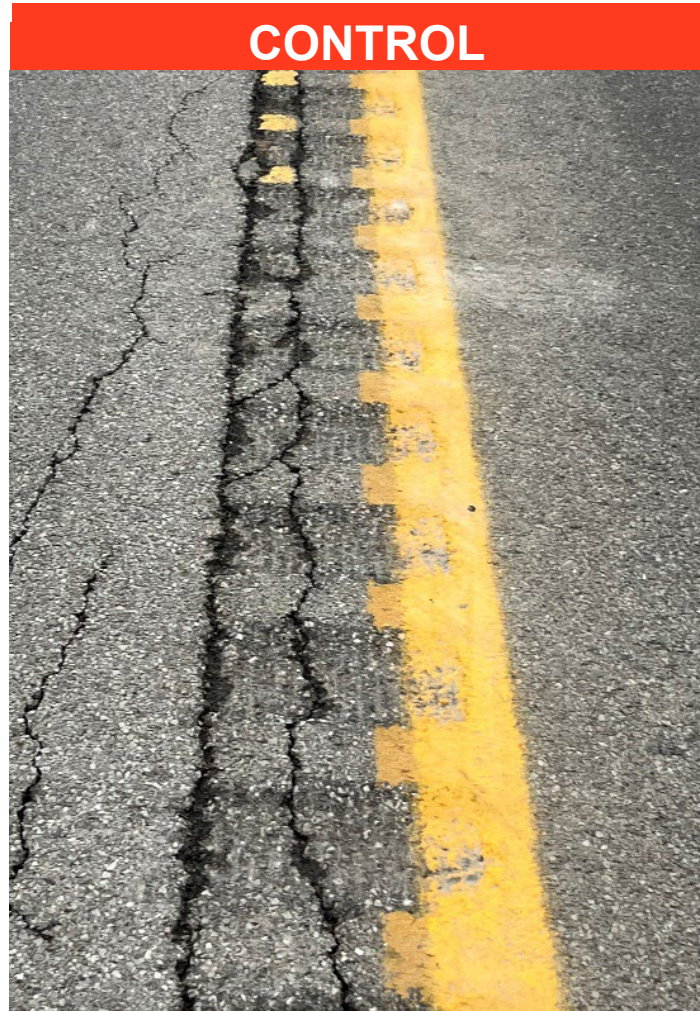
Constructed Aug. 2017
Reviewed Dec. 2023

Control

- Cracked 100% of length
- Multiple 1/2"-1" cracks

VRAM

- Cracked 100% of length
- 1/4" and some 1/2" cracks



National Road Research Alliance (NRRRA)

- Pooled fund, “cooperative implementation”
- 14 State DOTs, > 80 industry/academia
- “Materials-Based Methods to Improve Rumble Strip Durability”



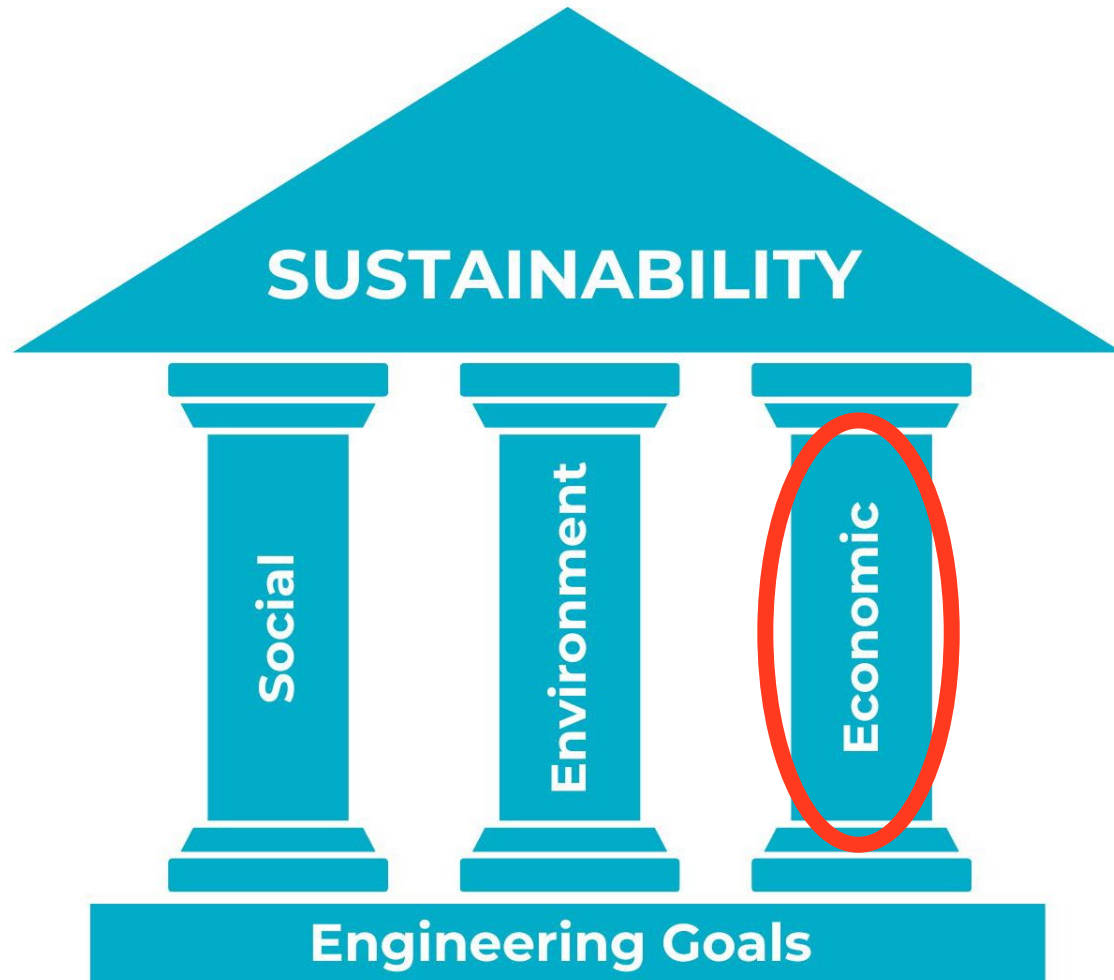
The screenshot displays the NRRRA website interface. At the top, there is a blue header with the Minnesota Department of Transportation (MnDOT) logo and the SJI logo. Below the header, a green navigation bar contains links for 'Search', 'MnDOT A to Z', and 'General Contacts'. The main content area is titled 'Road Research' and 'NRRRA Preventive Maintenance and Flexible Teams'. A secondary navigation bar includes links for 'MnROAD Home', 'Partnerships', 'NRRRA', 'NCAT Partnership', 'Search Reports', and 'Contacts'. The main content area features a breadcrumb trail: 'MnROAD | NRRRA | Structure & Teams | Preventive Maintenance Team'. The project title is 'Materials-Based Methods to Improve Rumble Strip Durability', with a status of 'In development'. The objective is described as investigating the impact of VRAM and RPE on CLRS durability. Below the text, there is a logo for NRRRA (National Road Research Alliance) and a map of the United States with 14 states highlighted in orange. The principal investigators listed are Dan Swiertz, PE; Asphalt Materials, Inc.; Katie DeCarlo, PhD; Heritage Research Group; and Signe Reichelt, PE; Behnke Materials Engineering.

Principal Investigator(s): Dan Swiertz, PE; Asphalt Materials, Inc., dswiertz@bitumixsolutions.com; Katie DeCarlo, PhD; Heritage Research Group, kdecarlo@hrglab.com; Signe Reichelt, PE; Behnke Materials Engineering, smreichelt@behnkematerialsengineering.com



Read the Project

VRAM - Pillars of Sustainability



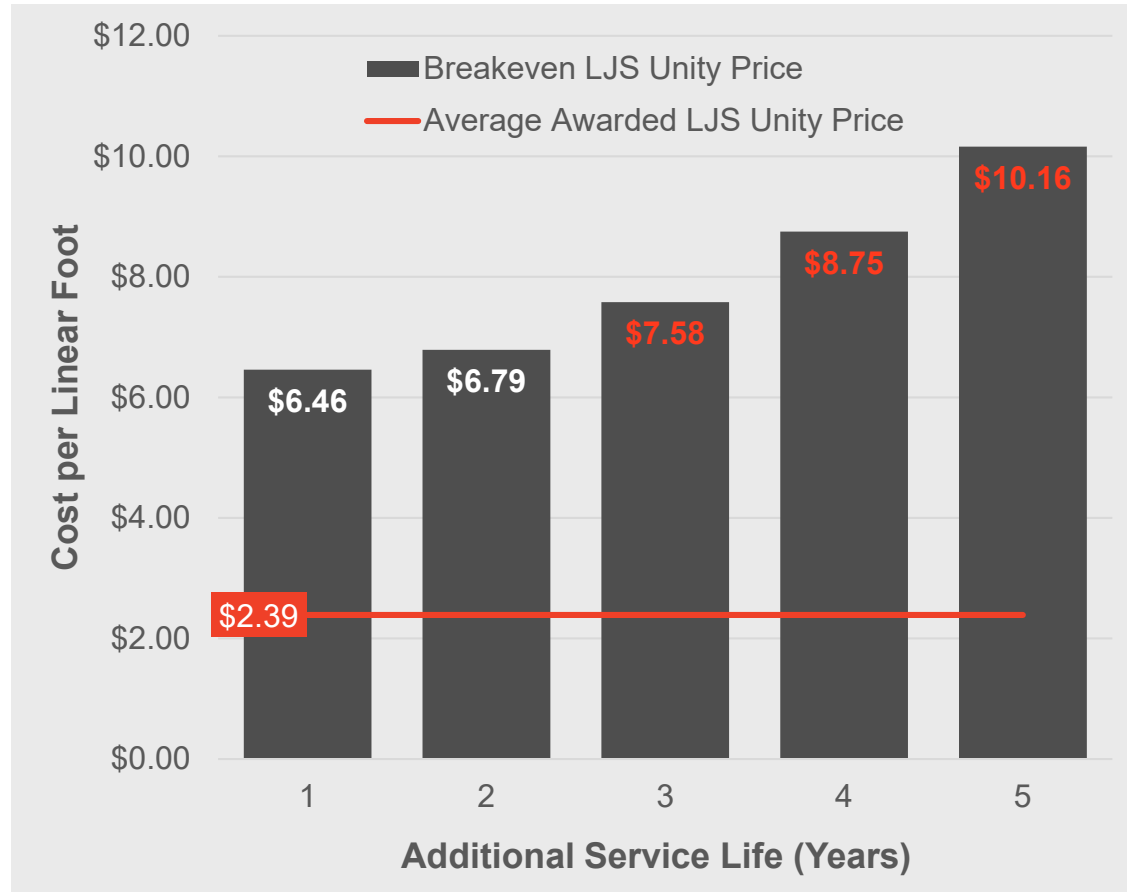
Achieve Engineering goals while achieving Sustainability goals

VRAM - Economic Pillar

IDOT's ROI: 3-5 times the cost of VRAM

IDOT VRAM Life Cycle
Cost Analysis

2-lane roadway
15-year basis



IDOT expects VRAM to provide a life extension of 3-5 years

The benefit of this technology is 3-5 times the cost, per IDOT

LJS Experimental Projects



Control



Control



Control



**IDOT US-51 VRAM
section at 15 yr old**



**IDOT IL-26 VRAM
section at 14 yr old**



**IDOT IL-50 VRAM
section at 14 yr old**

Indianapolis Motor Speedway



- Last resurfaced in 2004 using VRAM
- Prior to '04, resurfaced every 8 to 9 yrs
- Through 2024 Race – No resurfacings
 - Surface seals with RPE (Rapid Penetrating Emulsion)



Summary: VRAM's Value

- Rumble Strips increase safety
 - VRAM Reduces or eliminates the need for joint maintenance, which increases safety
 - The presence of CLRS compounds importance
- VRAM adds Sustainability benefits
 - Agency Calculated Life Cycle Cost Savings
 - Documented long-term performance



Questions about VRAM?



For more information go to
<https://www.thejointsolution.com>
Or Reach out to me Directly:
303-218-8058 | dhenderson@thgrp.com

J-BAND[®] APPLICATION - OTTERVILLE RD
Jersey County, IL



Asphalt Materials, Inc.



HSIP. Get Them Home Safely.

The Highway Safety Improvement Program (HSIP) connects communities and transportation agencies with funding to make safety improvements that reduce fatalities and serious injuries on our nation's public roadways. The HSIP maximizes safety benefits for all modes by allowing agencies to accelerate the adoption of the most effective transportation safety practices. Put your HSIP funds to work and get everyone home safely.

HSIP. Invest in the future. Save lives today.

Photo Source: @Getty Images.

Resources Available To Help You Apply For HSIP

- USDOT Federal Highway Administration trainings
- Your state DOT
- Consulting engineers



Scan for USDOT Resources