

40<sup>th</sup> meeting of the  
**IOWA FREIGHT ADVISORY COUNCIL**

March 10, 2023  
10:00 AM to 2:00 PM  
Courtyard by Marriot  
2405 SE Creekview Dr, Ankeny, IA 50021

**Meeting input objectives**

1. Provide questions and comments related to the state legislative session and IIA implementation.
2. Provide questions and comments on recent Iowa State University research.
3. Discuss ongoing shipping and manufacturing challenges and identify any actions moving forward.

**10:00 AM Safety Briefing**

**Amanda Martin**  
**Iowa DOT**

**Welcome & Introductions**

*Ice breaker: Provide any comments, updates, notable items, etc. related to your business since the last meeting.*

**Mike Steenhoek, Chair**  
**Soy Transportation**  
**Coalition**

**10:30 AM Iowa DOT Update**

General update from the Department, including the 2023 legislative session, continued implementation of the Infrastructure Investment and Jobs Act (IIJA), and current and future Mid America Association of State Transportation Officials (MAASTO) that Iowa DOT is involved with.

**Stu Anderson**  
**Iowa DOT**

**11:15 AM Next generation soybean-based treatments and additives for sustainable pavements**

Overview of our soybean oil related research that has led to the development of rejuvenators, maintenance treatments, and polymer modification systems for asphalt pavements.

**Eric Cochran**  
**Iowa State University**

**12:00 PM Lunch**

**12:45 PM Panel: Shippers and Manufacturers**

A discussion of ongoing challenges and opportunities for Iowa shippers and manufacturers.

**Mike Steenhoek, Chair**  
**Soy Transportation**  
**Coalition**

- Jessica Sprung, Sukup Manufacturing
- John Holterhaus, Pella Corporation
- Matt Leyser, John Deere Des Moines Works

**2:00 PM Adjourn**

**Future meetings:**

- June 16, 2023
- September 8, 2023
- December 15, 2023

40<sup>th</sup> meeting of the  
**IOWA FREIGHT ADVISORY COUNCIL**

March 10, 2023  
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 2405 SE Creekview Dr, Ankeny, IA 50021

**Members**

X	Mike Steenhoek (Chair), Soy Transportation Coalition	X	Jillian Walsh (Vice Chair), Traverro
X	Gabe Claypool, Des Moines Industrial		Joe McConnell, PDI
	Greg Dickinson, Ten D, Inc. Companies	X	Jackson Doud, Iowa Farm Bureau
X	Doug Martin, Amazon DSM5		Allison Meiners, IMTA
X	Bob Rafferty for Delia Meier, I-80 Group	X	Jared Meinhardt for James Niffenegger, Landus
X	James Mattsen for Joe Parsons, IAIS	X	Brad Sabin for Amy Homan, IANR
X	Kelly O'Brien, Union Pacific	X	Mark White, Agribusiness Association of Iowa
	Marty Wadle, Ruan		Ron White, Artco Fleeting Service
	Peter Skosey, BNSF	X	Ty Rosburg, Rosburg Livestock/Iowa Pork

**Ex-Officio Members**

X	Zhi Chen, Des Moines MPO		Colonel Jesse Curry, USACE Rock Island District
	Andrew Goodall, USACE Rock Island District	X	Mike Hadley, Keokuk County Board of Supervisors
X	Mike Harrington, IDALS		Todd Valentine, Iowa DPS (for Michael Kober)
X	Sean Litteral, FHWA Iowa Division	X	Scott Marler, Director, Iowa DOT
X	Tim Marshall, FHWA Iowa Division		Shirley McGuire, Federal Motor Carrier Safety
X	Zach James for Mike Norris, SEIRPC	X	Beth Balzer for Joseph Rude, IEDA
X	Louis Vander Streek, Iowa Utilities Board		Corey Champlin, Iowa State Patrol
X	Jennifer Wright for Aime Davidson, Iowa DNR		

**Iowa DOT**

X	Stu Andreson	X	Blake Wittrock
	Mikel Derby		Brenda Freshour-Johnston
X	Jim Glaspie	X	Sam Hiscocks
X	Maria Hobbs	X	Alex Jansen
	Renee Jerman	X	Garrett Pedersen
X	Amanda Martin	X	Tammy Nicholson
X	Caleb Whitehouse	X	Charlie Purcell

**Guests**

X	Erich Cochran, Iowa State University	X	John Holterhaus, Pella Corporation
X	Jessica Sprung, Sukup Manufacturing	X	Marv Wilson, Soylei Innovations
X	Matt Leyser, John Deere	X	Nacu Hernandez, Soylei Innovations
X	Larry Lloyd, Canadian Pacific		

## Meeting input objectives

1. Provide questions and comments related to the state legislative session and IJA implementation.
2. Provide questions and comments on recent Iowa State University research.
3. Discuss ongoing shipping and manufacturing challenges and identify any actions moving forward.

### 10:00 AM Safety Briefing

**Amanda Martin**  
**Iowa DOT**

Amanda Martin gives the safety briefing. Caleb Whitehouse is designated as the 911 caller with Maria Hobbs as the backup.

#### **Welcome & Introductions**

*Ice breaker: Provide any comments, updates, notable items, etc. related to your business since the last meeting.*

**Mike Steenhoek, Chair**  
**Soy Transportation**  
**Coalition**

Mike Steenhoek welcomes the members to the room and begins introductions with Sam Hiscocks. Following, Mike asks new members Ty Rosburg and Mark White to give longer introductions to the group.

Steenhoek then prompts the railroads to update the group on the status of rail service and the ripple effects from the Norfolk Southern derailment in East Palestine, Ohio.

Kelly O'Brien says that UP has worked with their customers to deal with the embargo situation. O'Brien says rail service is improving but invites members to discuss specific issues with her. O'Brien says that UP is required to carry all hazardous materials and all the railroads are enhancing safety voluntarily. She also says that the rail industry uses an app available to first responders that provides detailed information about the contents of rail cars.

Larry Lloyd adds that derailments and accidents have been reduced by 50% since 2000 due to safety investments. CP is adding 1,000 new wayside detectors and reducing the space between detectors to 15 miles from 40 miles as an industry standard. Lloyd emphasizes that safety is a partnership between the railroad and local first responders. CP anticipates that as part of their merger with KCS, they will continue to invest in training for local jurisdictions.

Brad Sabin says that the Class I railroads are very helpful to the short lines concerning training and assistance for safety. James Mattsen says IAIS is also investing in safety and that public perception of rail safety is being skewed by the media and the industry is still focused on safety.

Steenhoek asks the members whether positive train control (PTC) which is a mandate that allows for the remote control of a train to avert an accident, was present on the Norfolk Southern route in East Palestine. Lloyd says that he would defer to the NTSB. O'Brien says that PTC was a requirement from the government that the railroads had to invest in.

Steenhoek updates the group on the status of the inland waterway system and specifically the rise in water levels since the last meeting. Water levels in St. Louis are higher than they were this time last year. It is predicted that the Missouri river will have an abbreviated shipping season due to low water levels.

### 10:30 AM Iowa DOT Update

**Stu Anderson**  
**Iowa DOT**

General update from the Department, including the 2023 legislative session, continued implementation of the Infrastructure Investment and Jobs Act (IIJA), and current and future Mid America Association of State Transportation Officials (MAASTO) that Iowa DOT is involved with.

Stu Anderson begins with an update on federal funding. Iowa DOT did not receive any funding awards in the latest rounds of the INFRA, Mega, or Rural programs. Anderson says that the Lansing bridge and Wright Brothers interchange projects scored well but didn't make the cut.

The Sac & Fox tribe was awarded \$1.2 million for a Reconnecting Communities grant.

97 counties in Iowa aggressively pursued SS4A funding. Almost every county received funding for safety action plans, and Fayette County received \$10.4 million to implement safety improvements on local roads.

2024-2028 Highway Program development is underway (approval in June 2023). Despite inflated costs, DOT does not anticipate having to remove projects, but some will be delayed by 1-year. Staff are seeing signs that costs are beginning to moderate.

The DOT legislative priorities include a bill to allow local jurisdictions more flexibility in issuing oversize/overweight (OSOW) permits (passed and signed), federal commercial driver's license (CDL) requirements (passed in the house), Driver's Education bill (passed by house and senate), CDL third-party tester expansion (passed by house and senate), and expansion of Restricted CDL for ag purposes (passed in the house).

The Iowa DOT internal business plan includes a 2023 objective to "implement transportation 4.0" which is an initiative to implement new transportation technologies. There is an initial emphasis on freight corridors and freight transportation.

Anderson also provides an explanation of MAASTO and their activities, including the Mid-American Freight Coalition and Truck Parking Information Management Systems (TPIMS).

Finally, Anderson tells the members that the mooring cell project at Lock 14 will have a groundbreaking ceremony later in the spring, but Iowa DOT's contributed funds agreement is still being processed by USACE at their headquarters in DC.

**11:15 AM Next generation soybean-based treatments and additives for sustainable pavements**

**Eric Cochran  
Iowa State University**

Overview of soybean oil related research that has led to the development of rejuvenators, maintenance treatments, and polymer modification systems for asphalt pavements.

Eric Cochran introduces himself to the group. Cochran begins with how soybean oil is used to create other chemicals including several polymers. Cochran is partnering with Soylei to produce soy-based asphalt treatments and asphalt shingles, as well as researching other uses of soy and soybean oil. Specifically, the oils they produce can be used to rejuvenate old, crushed asphalt.

This technology has been a part of demonstration projects throughout the country, but mostly the Midwest with good results. The goal is to avoid pavement from cracking or rutting, which

requires a balance between hardness (to prevent rutting) and flexibility (to prevent cracking). Stu Anderson asks if Cochran or Soylei have done carbon life cycle reduction calculations to estimate its environmental benefits. Cochran said they haven't but would support a third party conducting the calculations.

**12:00 PM Lunch**

**12:45 PM Panel: Shippers and Manufacturers**

A discussion of ongoing challenges and opportunities for Iowa shippers and manufacturers.

**Mike Steenhoek, Chair  
Soy Transportation  
Coalition**

- Jessica Sprung, Sukup Manufacturing
- John Holterhaus, Pella Corporation
- Matt Leyser, John Deere Des Moines Works

Mike Steenhoek begins the panel by introducing the panelists and asking them to briefly describe their supply chain. He also asks the panelists what they make at their facilities. Sukup works with IANR to deliver materials to their facility in Manly.

Steenhoek asks the panelists about trucking regulations. Jessica Sprung says that Sukup lost several of their older drivers after the ELD mandates and is not looking forward to speed limiter requirements. Scott Marler asks what the concern is about the speed limiters. Sprung says that the restriction on the drivers irritates them, and passenger vehicles do not have speed limiters, and the speed differential that it creates is dangerous. Matt Leyser says that John Deere works with TMC for freight transportation. TMC says they have issues replacing older drivers.

Steenhoek asks the panelists if they are reexamining a "just in time" supply chain mentality. Sprung said Sukup is adding redundancies to their supply chain such as additional suppliers, keeping more raw materials in house, and building extra products preemptively. John Holterhaus says that Pella is not moving away from "just in time" because their business model is effectively "make to order". However, they are adding suppliers and being more selective about choosing suppliers with resiliency in mind. Leyser says that John Deere is also rethinking which suppliers they use with resiliency in mind.

Steenhoek asks the panelists about workforce issues such as finding drivers and workers. Sprung says that there has been turnover because of daycare costs so Sukup has built a daycare center on site. Sprung says that a lot of the labor issues have come down to raising wages to attract workers, and scheduling for drivers. Holterhaus echoes Sprung's statement on wages and scheduling, as well as local/onsite childcare. Leyser says John Deere has been hiring for a while before and after the labor strike in 2021. He said that many new hires quit very soon after being hired, which is irritating. Holterhaus and Leyser both say that they must compete with other manufacturers for labor.

Scott Marler asks if getting CDLs has been a bottleneck for new drivers. Sprung says yes and that Sukup has been looking to hire younger drivers. Holterhaus says that Pella does not have a CDL training program, but they've considered starting one. They also have had to lessen their requirements for new drivers to attract younger people.

Steenhoek asks what the most frequent complaint is from their drivers. Holterhaus says that it is ELDs and that he doesn't hear much about infrastructure issues, but voiced support for the

Super-2 improvements planned for US 34 in southern Iowa. Steenhoek asks Leyser if John Deere runs into regulatory issues with OSOW loads. Leyser says that Deere must have it figured out because he doesn't run into any issues.

Steenhoek asks if they have any opinion on new trucking technologies like automated drivers or platooning. Holterhaus says they aren't looking into anything beyond electric vehicles for onsite equipment. He also says that they have implemented forward facing and driver facing cameras implemented into the ELD. He claims that the drivers see the benefit of the surveillance technologies.

Steenhoek asks if failed drug test issues have impacted the panelists. Holterhaus and Sprung say they haven't had this issue.

Steenhoek asks about their sustainability efforts. Leyser says that John Deere has set several goals surrounding Co2 and water usage. They haven't yet seen it translate to change in behavior from their suppliers.

Garrett Pedersen asks if there are disincentives for dual-source supplying. Holterhaus says that there are some quality control concerns by expanding suppliers because a new supplier might not be able to keep up with their demand. Sprung says that Sukup just got a bad batch of bolts from a new supplier. Leyser says that John Deere focuses on multiple factories getting in the way of each other when choosing suppliers. They have also been turned down from suppliers recently because of their own issues finding parts or labor. Holterhaus follows up saying that distributors have been having labor issues in warehouses.

Tammy Nicholsen asks if they have pursued different demographics for drivers. Sprung says that Sukup hasn't purposely sought-after new demographics. Holterhaus says that Pella has sought more diversity throughout the corporation as part of their DEI initiative. Leyser says John Deere is looking everywhere.

Steenhoek asks broadly "how is business" and where each panelists companies hope to grow in the next 5 years. Sprung says that sales of Sukup's commercial grain bins have grown recently. Steenhoek says that farmers have been seeking more storage to weather out supply chain disruptions. Leyser says that John Deere's technological advancements within the machinery is continuing to grow. John Deere has been having internal discussions about whether they should identify as a tech company because of the growth of their abilities in software and computers. Holterhaus says that since 2019, Pella has been attempting to double their business by 2025 and has experienced a lot of expansion into the vinyl sector.

## **2:00 PM Adjourn**

### **Future meetings:**

- June 16, 2023
- September 8, 2023
- December 15, 2023

# IOWA DOT UPDATE

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Iowa Freight Advisory Council

March 10, 2023



# Topics

- Federal Funding Update
- Five-Year Program Development
- Business Plan Objectives
- 2023 Legislative Session
- MAASTO Overview
- Mooring Cell Update

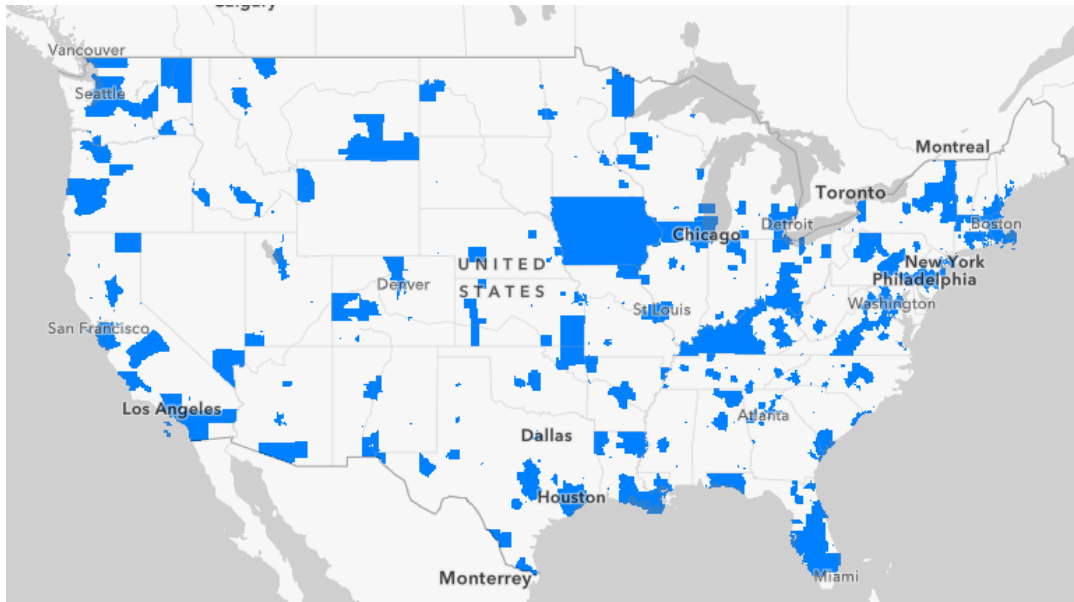


# Federal Funding Update

- Discretionary Programs
  - INFRA/Mega/Rural
    - INFRA: Announced in September – no Iowa awards
    - Mega/Rural: Announced in January - no Iowa Awards
    - Expect another round of funding availability for INFRA/Mega/Rural to be announced Spring 2023
  - RAISE: 2023 Applications were due Feb. 28, 2023
  - CRISI – Rail Infrastructure Applications were due Dec. 1, 2022
  - Reconnecting Communities Awards announced in February
    - Planning Grant Award: Sac & Fox Tribe (Meskwaki) awarded \$1.2 million

# Federal Funding Update

- Discretionary Programs (continued)
  - Railroad Crossing Elimination Program
    - Applications were due October 4, 2022
    - Several applications were submitted by Iowa communities
  - Safe Streets and Roads for All (SS4A): Announced Feb. 1
    - Action Plan Awards: 7 grants for \$3.8 million
    - Implementation Award: Fayette County for \$10.4 million



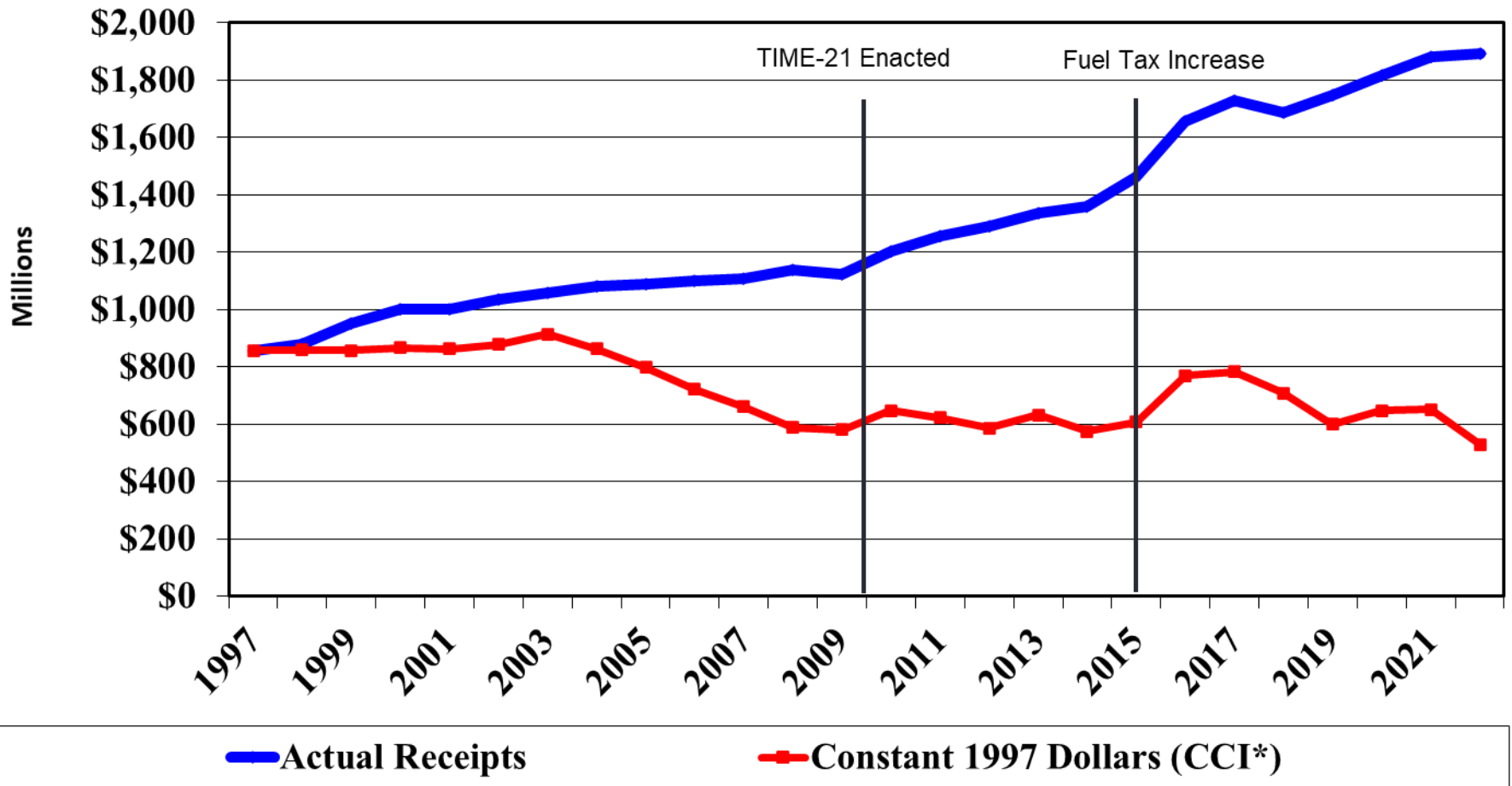
# 2024-2028 HIGHWAY PROGRAM

- Development is underway (approval in June 2023)

## CHALLENGES

- No additional funding this cycle
- Federal funding uncertainty
  - FY 2027 and 2028 are beyond Infrastructure Bill authorization
- Construction cost increases

# RUTF Revenue



\*CCI= Iowa Construction Cost Index. This reflects the inflation of roadway construction costs in Iowa and corresponding loss in buying power.

# 2023 Legislative Session

- FY 2024 Budget
- Legislative Priorities Status
  - Overweight Permits in Special or Emergency Situations
  - Federal CDL Compliance
  - Driver's Education – Behind-the-Wheel Instructors to provide final driver's education drive test
  - CDL Third-Party Tester Expansion
  - Expansion of Restricted CDL for Agricultural Purposes

## ONE YEAR OBJECTIVES FOR 2023

- Implement transportation 4.0
- Implement advanced customer service
- Improve recruitment, hiring, onboarding, and retention
- Develop new approaches to resource management and prioritization
- Support innovation

## Implement transportation 4.0

**5-Year Priority Goal:** *Improve transportation system safety and performance*

**Exec Sponsors:** *Stu Anderson, Dave Lorenzen*

- Implement technologies/strategies that move products and goods to market safer and more efficiently
- Develop statewide strategy supporting economic development
- Target manufacturing, agriculture, and bioscience industries
- Partner with Iowa Economic Development Authority
- Focus on freight corridors
- Find ways to integrate plans and policies
- Partner with business stakeholders to refine strategies and tactics

# MAASTO Overview

- Mid America Association of State Transportation Officials (MAASTO)
- Originally organized in 1907 (Prior to the national organization – AASHTO)



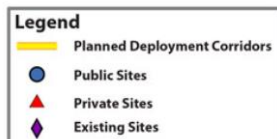
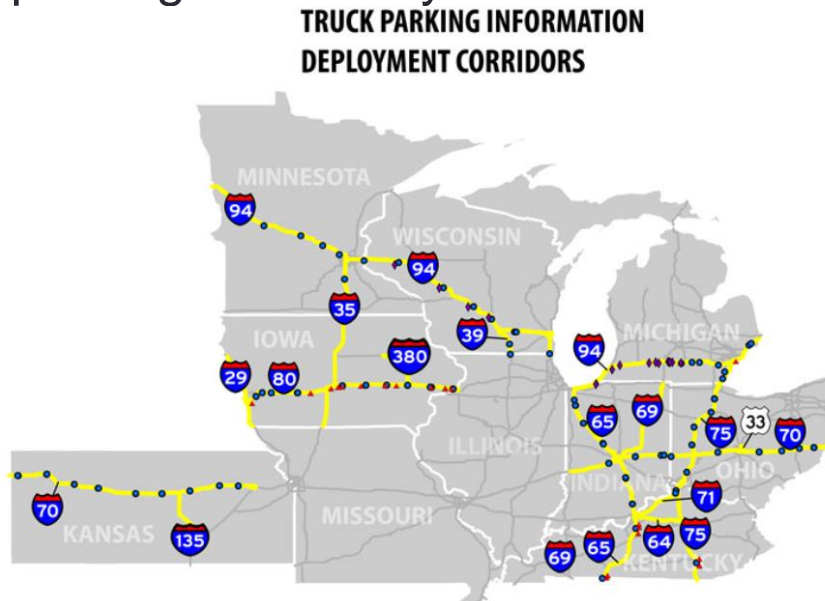


# MAASTO Overview (continued)

- Collaboration/Coordination
  - Annual meeting
  - Board of Directors
  - Committees
    - Chief Counsel
    - Chief Engineers
    - Connected and Automated Vehicle
    - Diversity and Inclusion
    - Electric Vehicles
    - Motor Carrier (and Subcommittee on Highway Transport)
    - Planning
    - Strategic Transportation Issues Committee
  - Mid America Freight Coalition

# MAASTO Overview (continued)

- Regional Truck Parking Information Management System
  - Eight of 10 MAASTO states (including Iowa) awarded a \$25 million grant to develop a system where drivers can monitor parking availability and make better-informed parking decisions.



# MAASTO Overview (continued)

- Emergency Divisible Load Management
  - Memorandum of Understanding signed to define acceptable emergency divisible load truck weights and agreed to expedite these shipments across state lines during presidentially declared disasters
- Ongoing initiatives
  - Regional Freight Resilience Project
  - Freight Electrification Project

# Mooring Cell Update

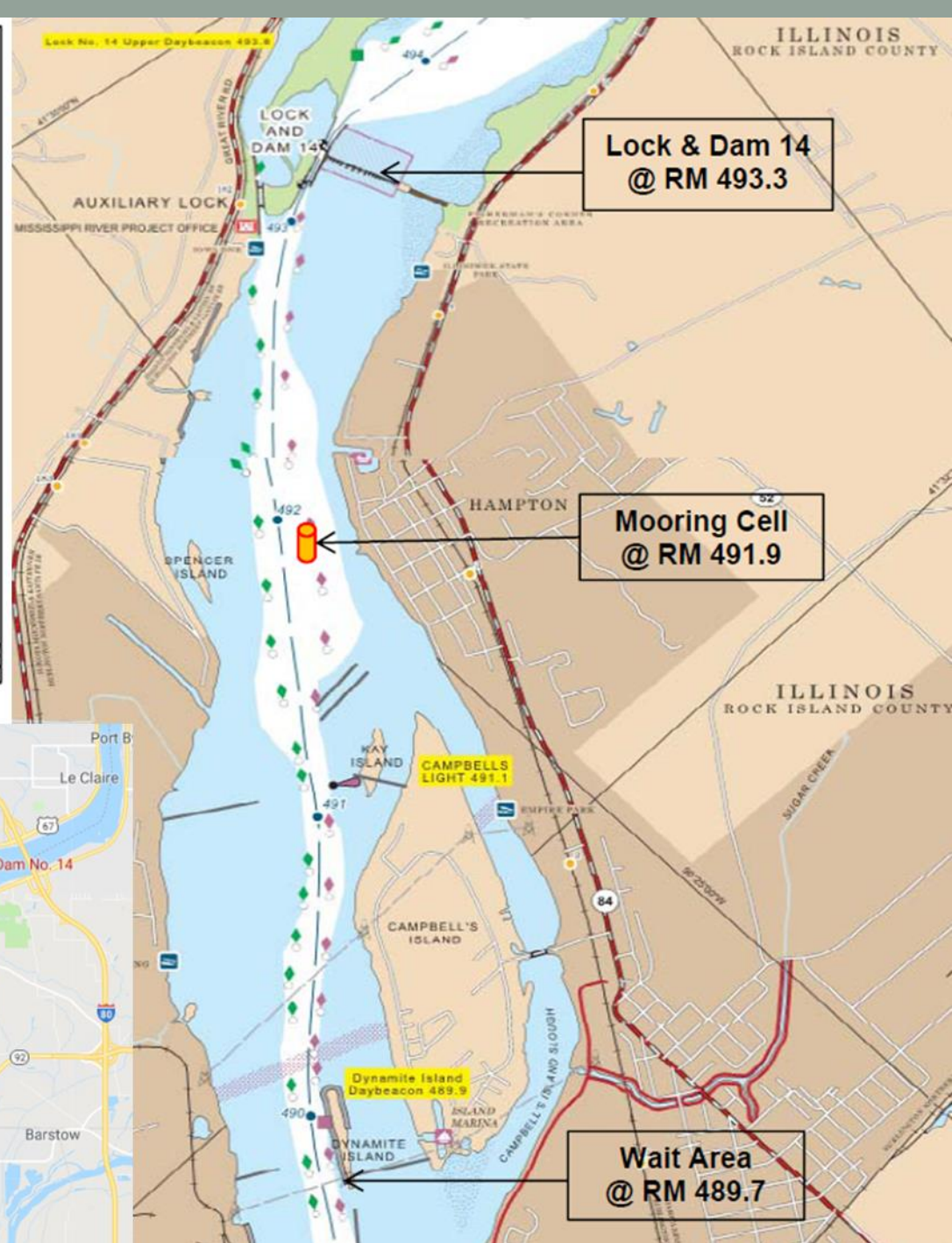
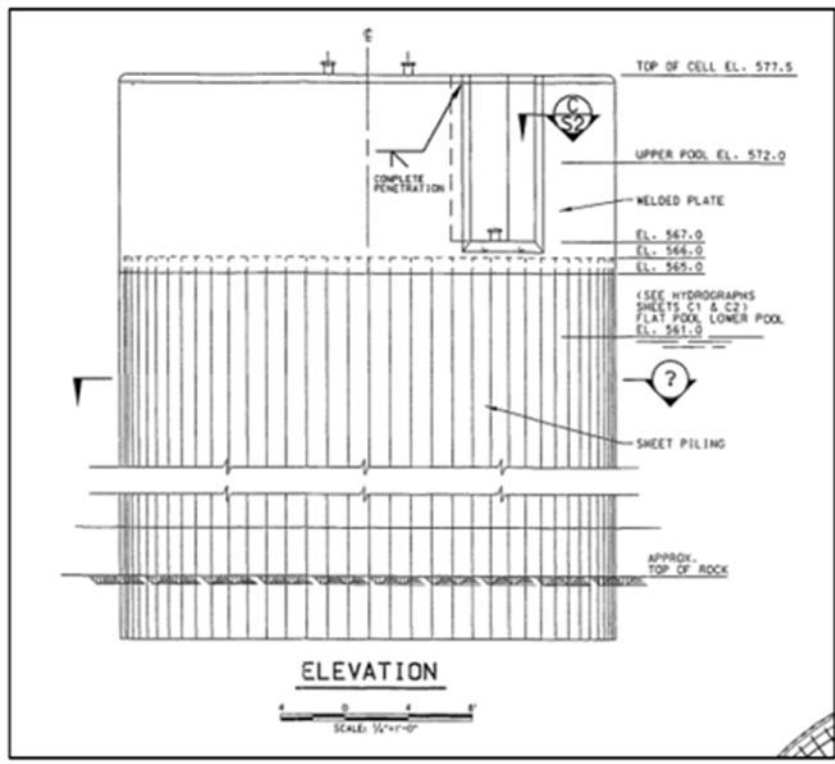
- What is a mooring cell?
  - Efficient and environmentally friendly facility for tows approaching a L&D to moor (tie off) while waiting for the lock to be available
  - Typically located adjacent to main navigation channel
  - Constructed of sheet-piling driven into a circular cell and filled with earth and/or concrete
  - Without mooring facility, towboats must move close to shore and ground barges, tie off to bankline trees, or maintain engine power
- Benefits
  - Improved lock approach times for exchange lockages
  - Reduced environmental impacts
  - Improved operational safety
  - Replicability



# Mooring Cell Update (cont.)

- USACE Mooring Cell UMR Working Group identified top priority locations: L&D 14 lower pool was #1
  - Waiting area currently 3.6 miles downstream
  - Proposed mooring cell location would be only 1.4 miles downstream = 2.2 mile difference





Source: USACE



# Mooring Cell Update (cont.)

- Costs: \$2 million for L&D 14 lower pool site
- Pilot funding proposal
  - Contributed funds agreement with USACE
  - 80% National Highway Freight Program (NHFP)
  - 20% State Infrastructure Bank

Source	Amount
NHFP allocated funds (Federal)	\$1,600,000
State Infrastructure Bank (Non-Federal)	\$400,000
<b>Total</b>	<b>\$2,000,000</b>

- Groundbreaking this spring!

# Questions?

Stu Anderson

[stuart.anderson@iowadot.us](mailto:stuart.anderson@iowadot.us)

515-239-1661



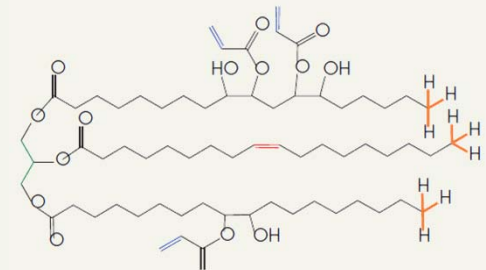
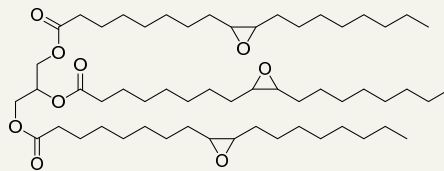
# Next generation soybean-based treatments and additives for sustainable pavements

Hulf# #rfkudg#

IOWA STATE UNIVERSITY  
OF SCIENCE AND TECHNOLOGY



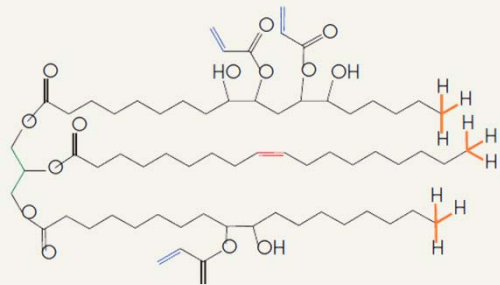
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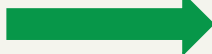
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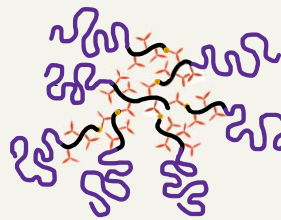
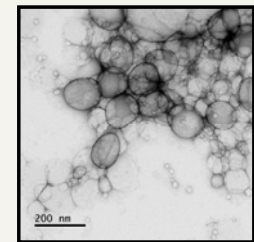
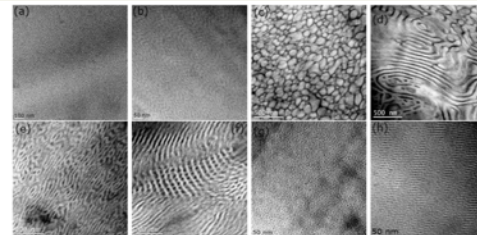


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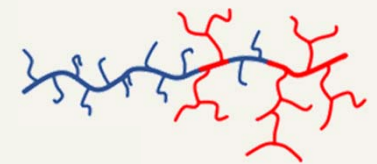
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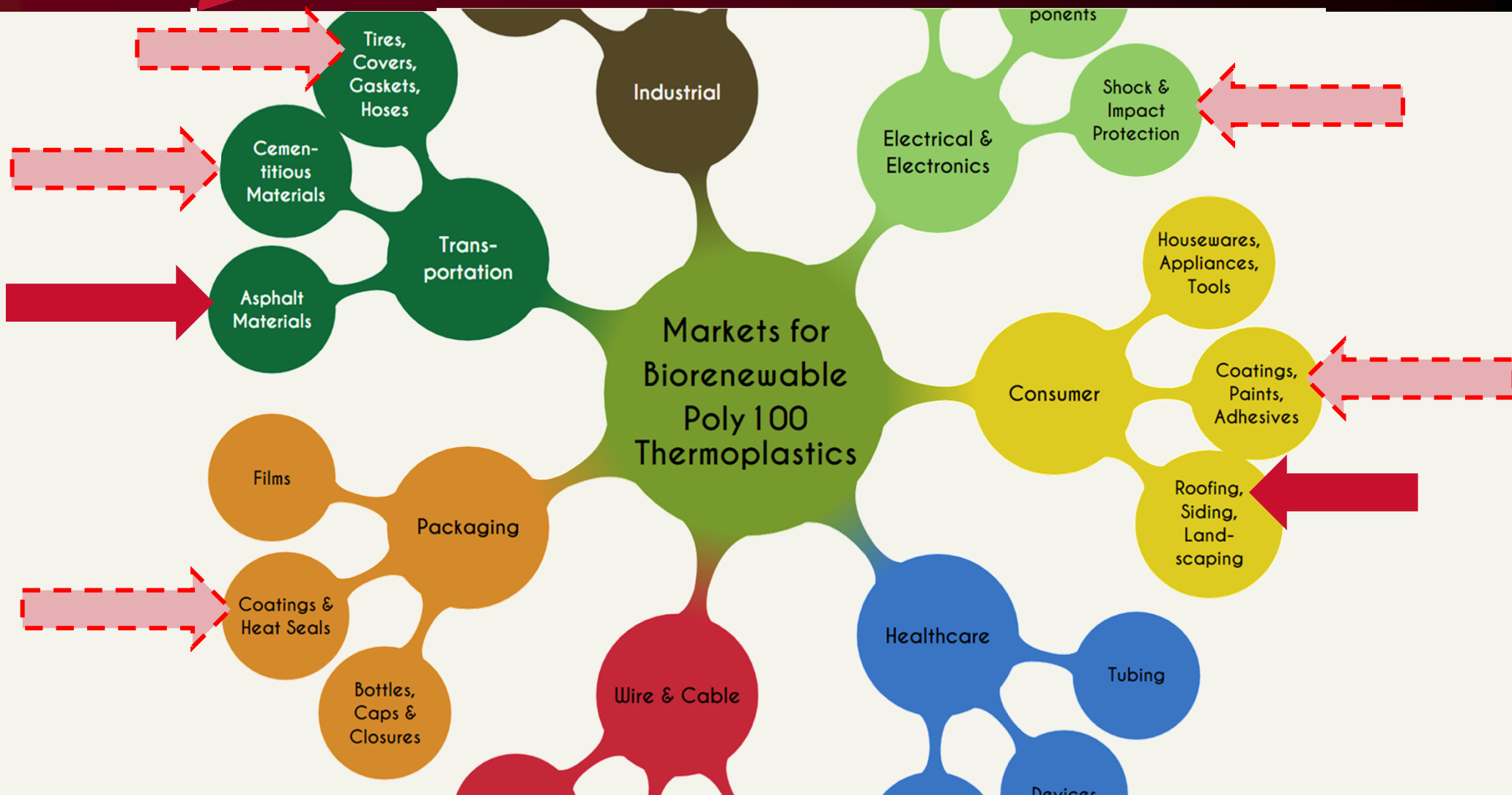


## Polym er m anufacturing – The Poly100 process

- Recovery of polym ers from solution is capital and resource intensive.
- PAEHOSO can be m ade in 1 pot
  - EHOSO → AEHOSO
  - AEHOSO → AEHOSO + Solvent
  - AEHOSO → AEHOSO + Biosolvent
  - AEHOSO + Biosolvent → PAEHOSO + Biosolvent

PAEHOSO +  
Biosolvent





IOWA STATE UNIVERSITY  
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**Invigorate**<sup>®</sup>

**Peak 301**<sup>®</sup>

**Biomag**<sup>™</sup>  
HOT MIX  
**Biomag**<sup>™</sup>  
TOPICAL+  
**Biomag**<sup>™</sup>  
EASY PAVE  
**Invigorate**<sup>®</sup>  
TOPICAL

**Biomag**<sup>™</sup>  
EASY PMAC

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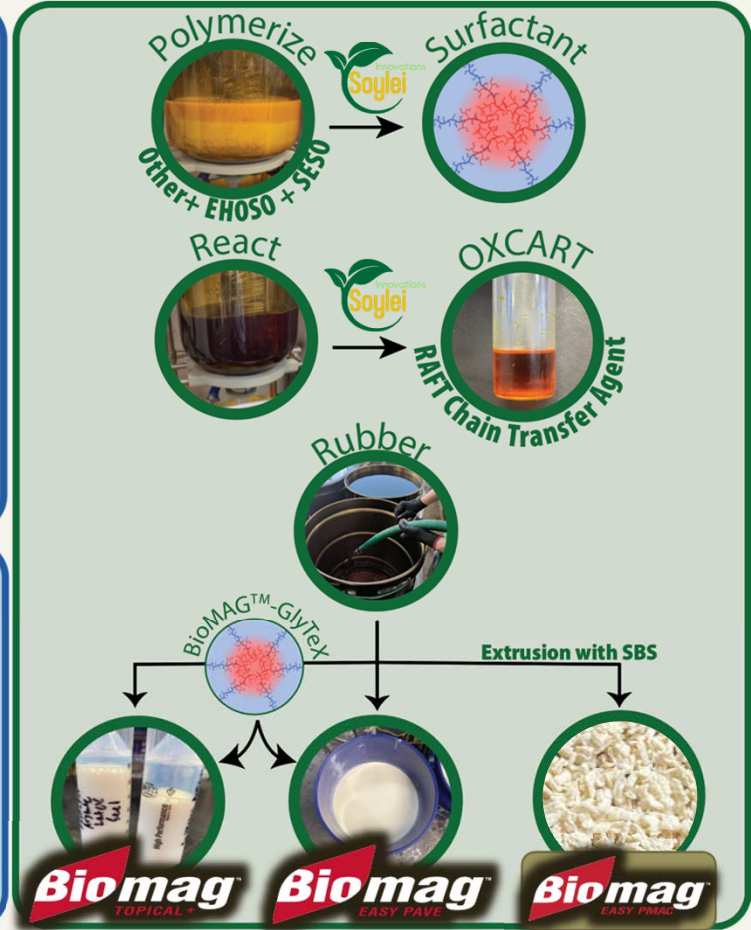
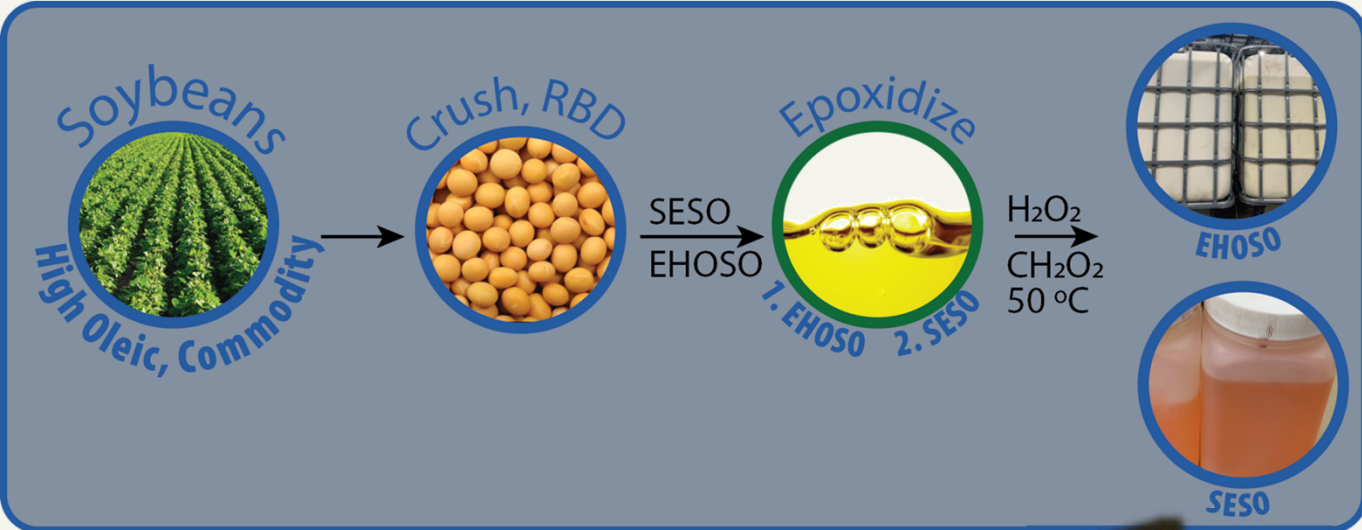
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# ACS

TECHNICAL PRODUCTS





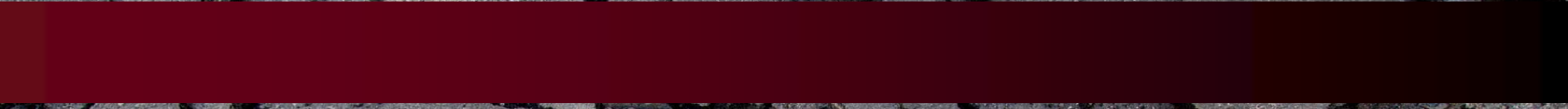
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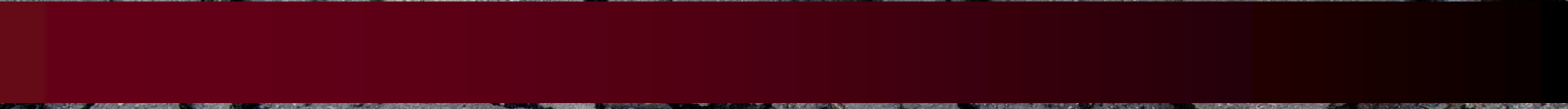
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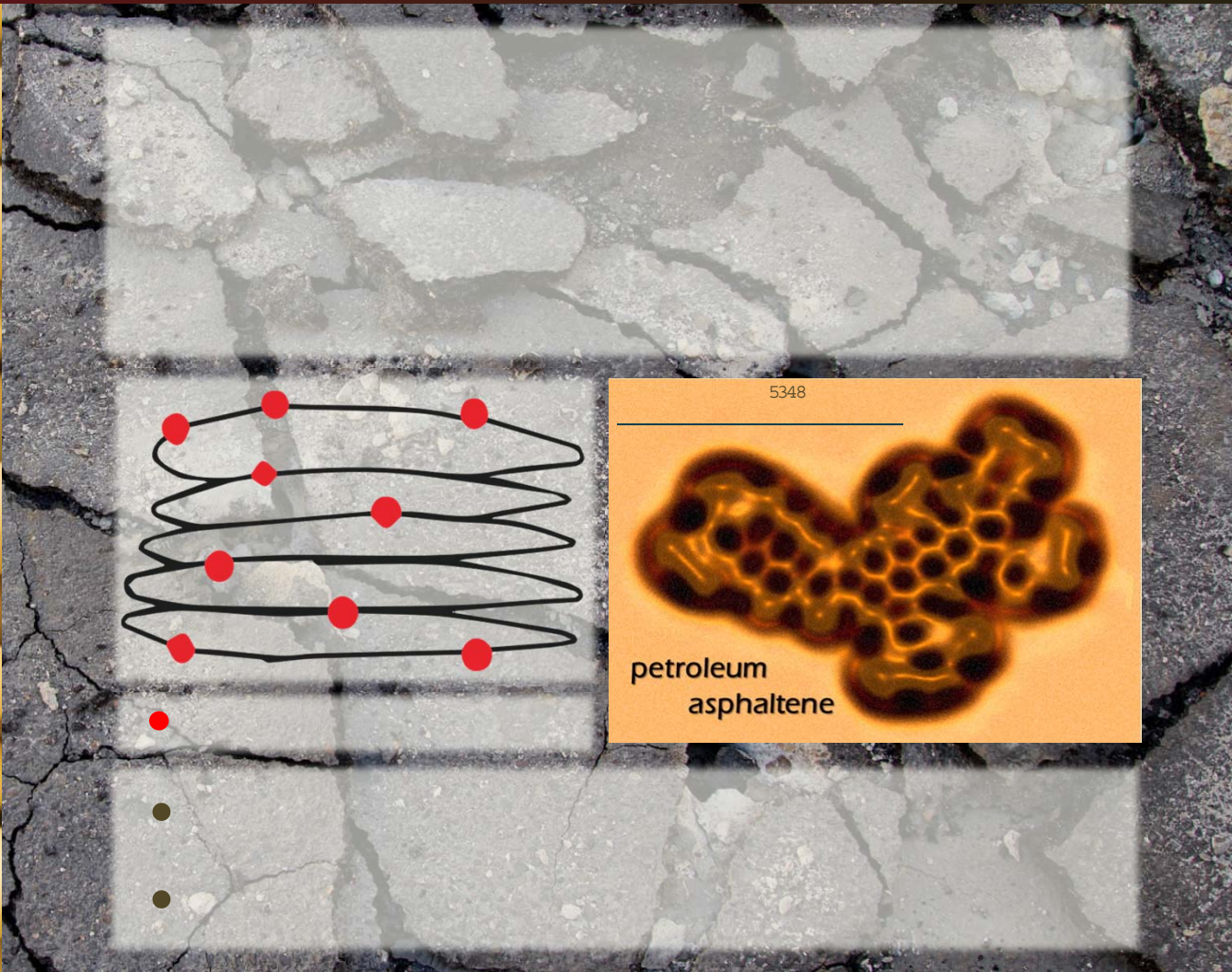
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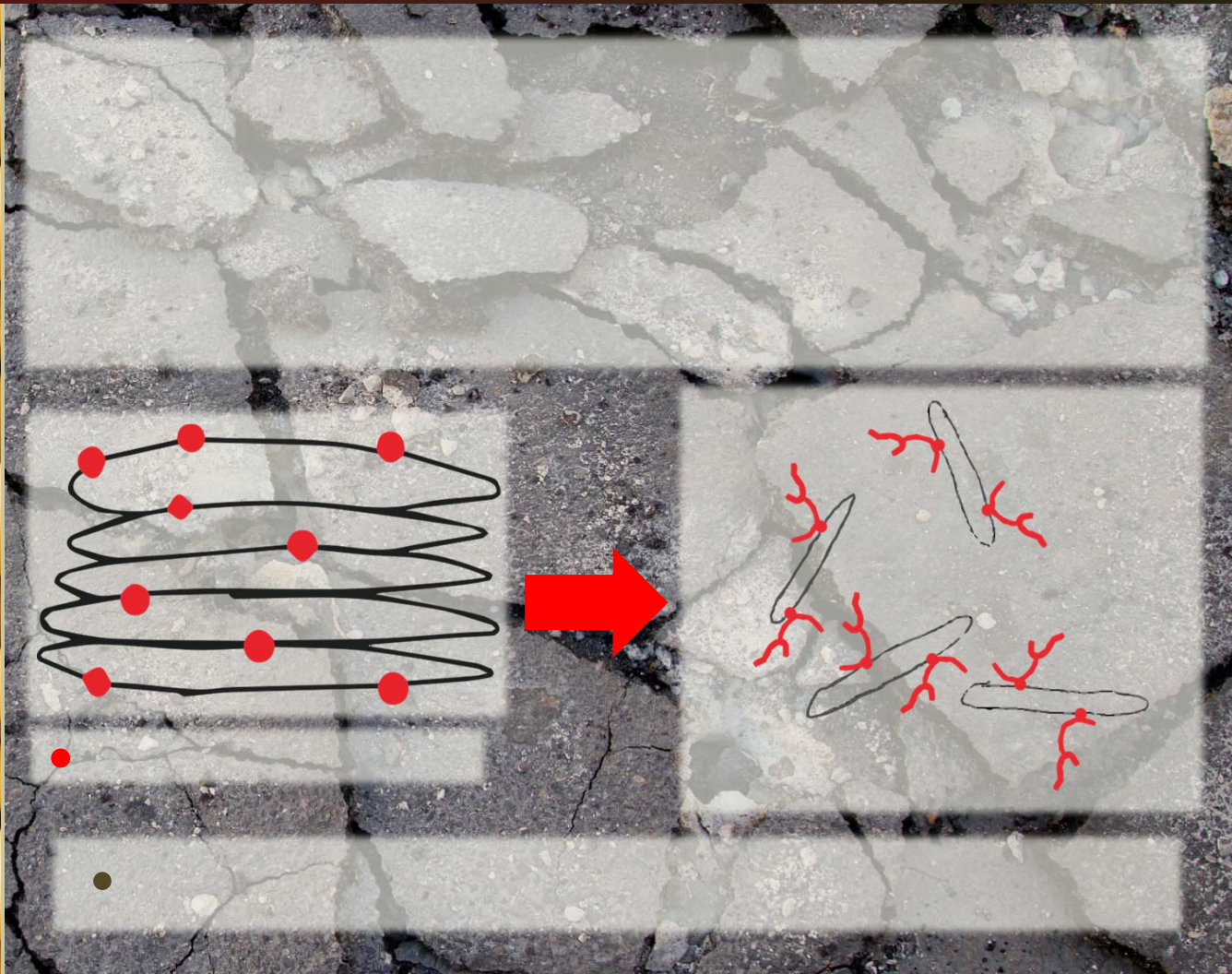




petroleum  
asphaltene



**Invigorate™**  
REJUVENATOR

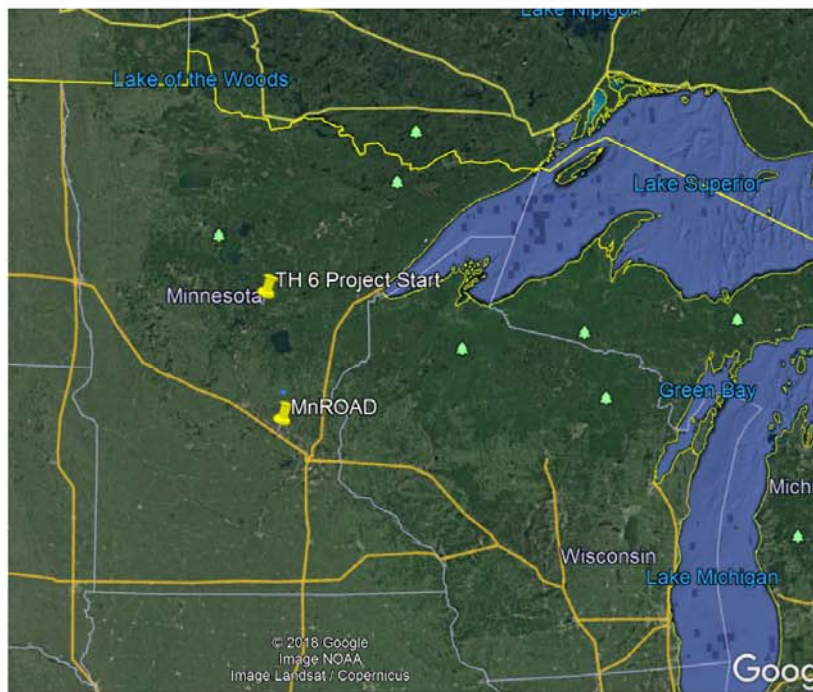


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Jrrjd#vhhw#lhz #dxjvw#534;



### Climatic Data (Step 3 of 6)

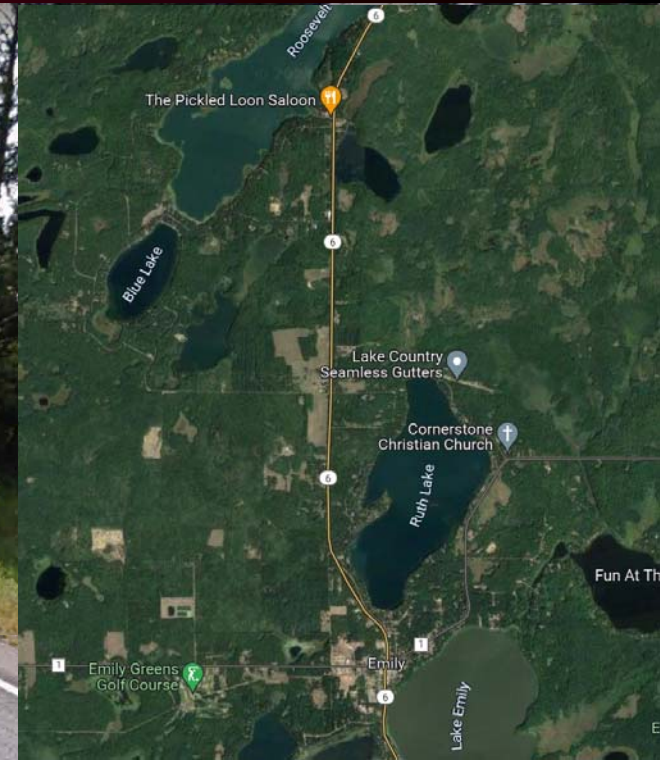
Lowest Yearly Air Temperature, °C:	-45.90
Low Air Temp Standard Deviation, °C:	4.22
Yearly Degree-Days > 10 Deg. °C:	2009.49
High Air Temperature of high 7 days:	30.71
Standard Dev. of the high 7 days:	2.66
Low Pavement Temperature 50%:	-34.50
Low Pavement Temperature 98%:	-42.10
High Avg Pavement Temperature of 7 Days 50%:	52.14
High Avg Pavement Temperature of 7 Days 98%:	56.62

Target PG xx-34 even though MnDOT would use 58-28  
For this job

# Invigorate™

REJUVENATOR

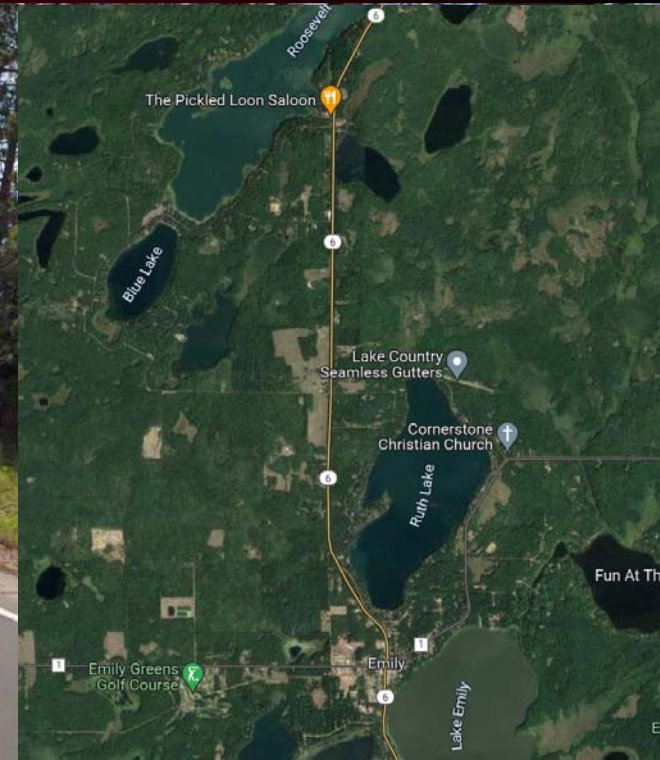
Jrrjd#vhhw#lhz #dxjxw#534;



# Invigorate™

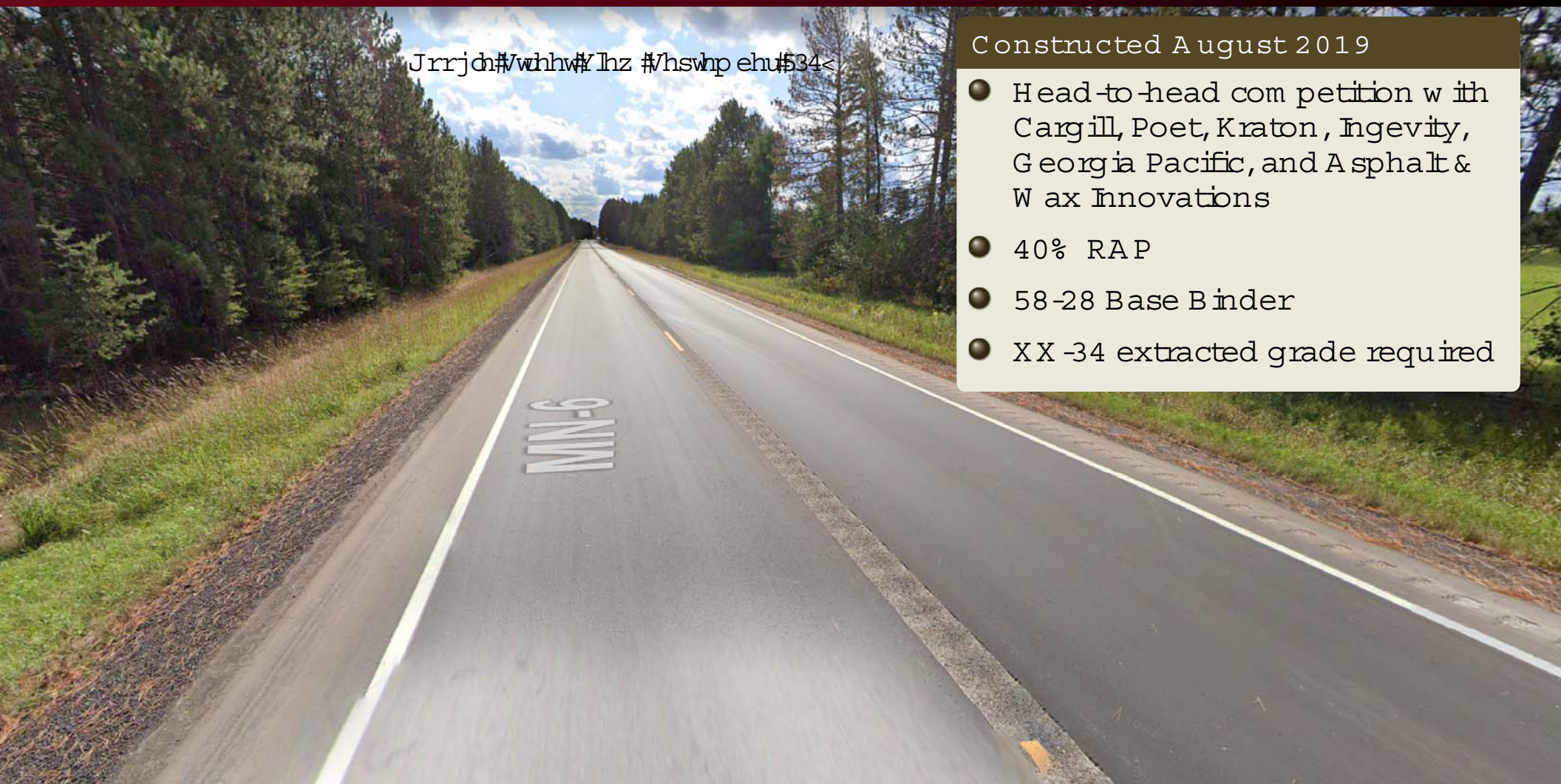
REJUVENATOR

Jrrjd#whhw#lhz #hswp ehuf34<



# Invigorate™

REJUVENATOR



Jrrjd#whhw#lhz #hswp ehuf\$34<

Constructed August 2019

- Head-to-head competition with Cargill, Poet, Kraton, Ingevity, Georgia Pacific, and Asphalt & Wax Innovations
- 40% RAP
- 58-28 Base Binder
- XX-34 extracted grade required





LONG-TERM TESTING AND ANALYSIS ON ASPHALT MIX REJUVENATOR FIELD SECTIONS

MnDOT Contract 1036343

TPF-5(341) National Road Research Alliance

Task 5: Annual Interim Update 2nd Year

*Prepared by:*

Zheng Wang (Graduate Student)

Jo E. Sias (PI)

Eshan V. Dave (Co-PI)

Department of Civil and Environmental Engineering

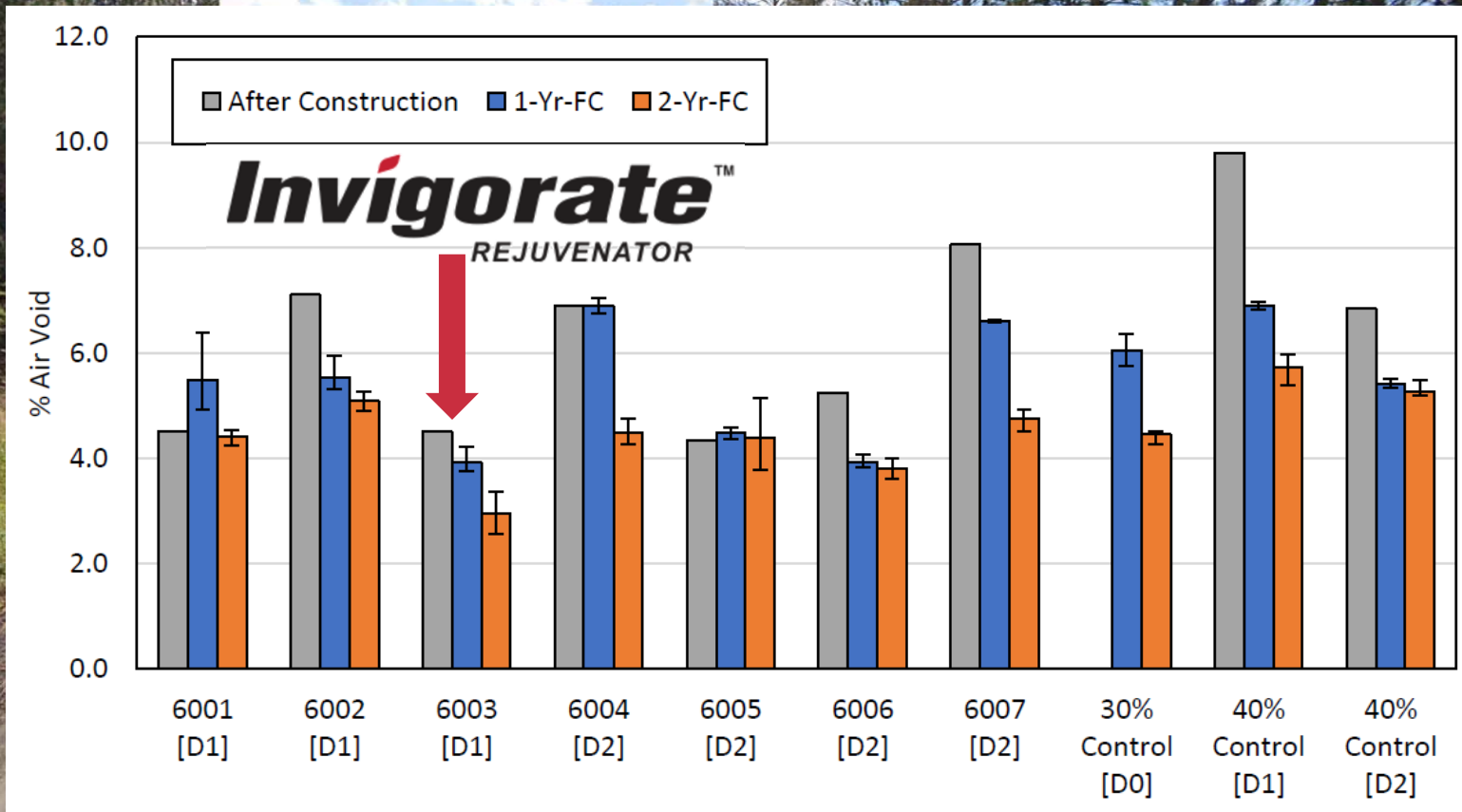
University of New Hampshire

Gerald Reinke

Andrew Hanz

MTE Services, Inc

1x0#Jhsru#Dydkedh#rqdqh



dh#rqdgh

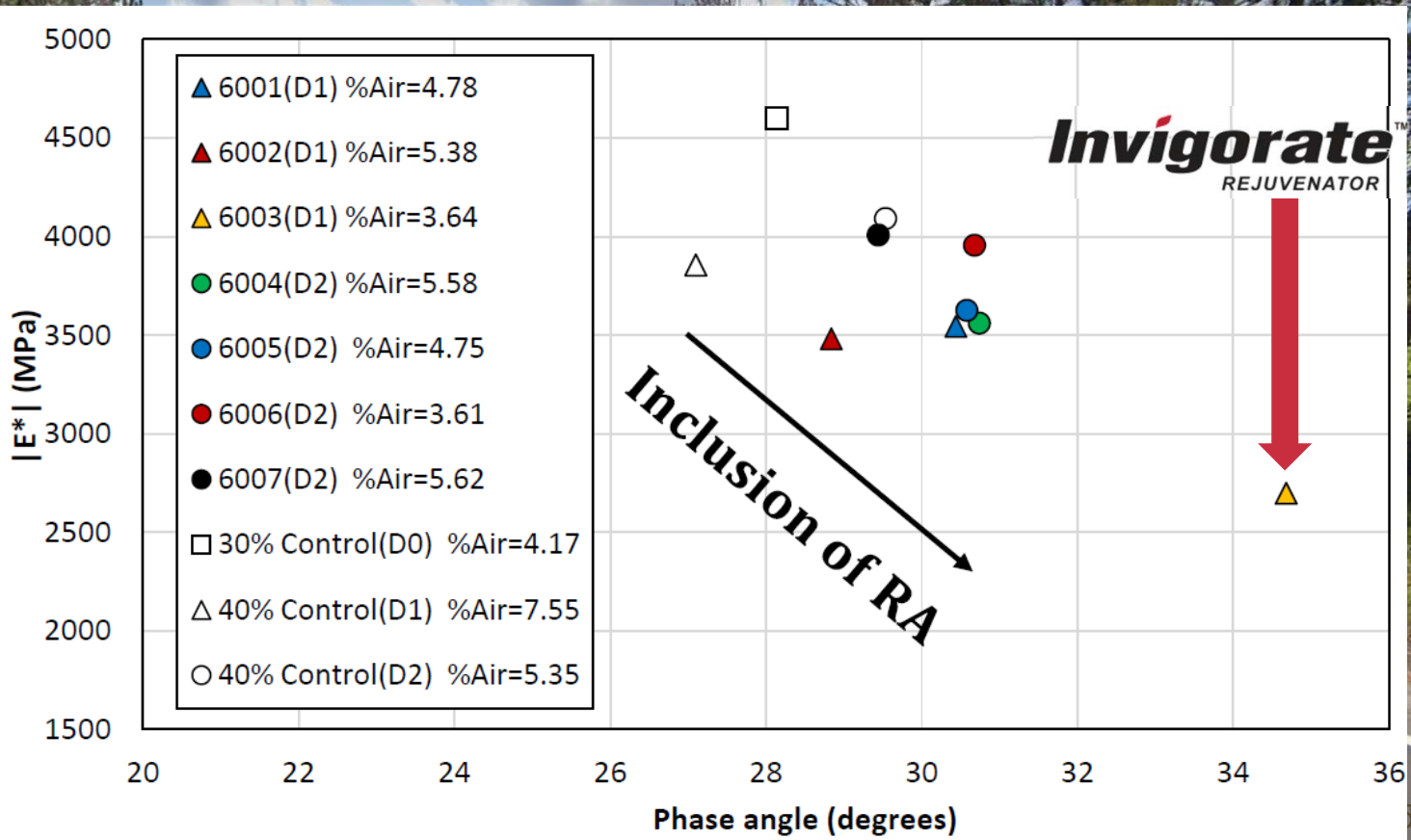


Figure 3-10 Mixture Black Space Plot for 2-Year FC (Temperature=20°C; Frequency=5Hz)

tech#rqdbjh

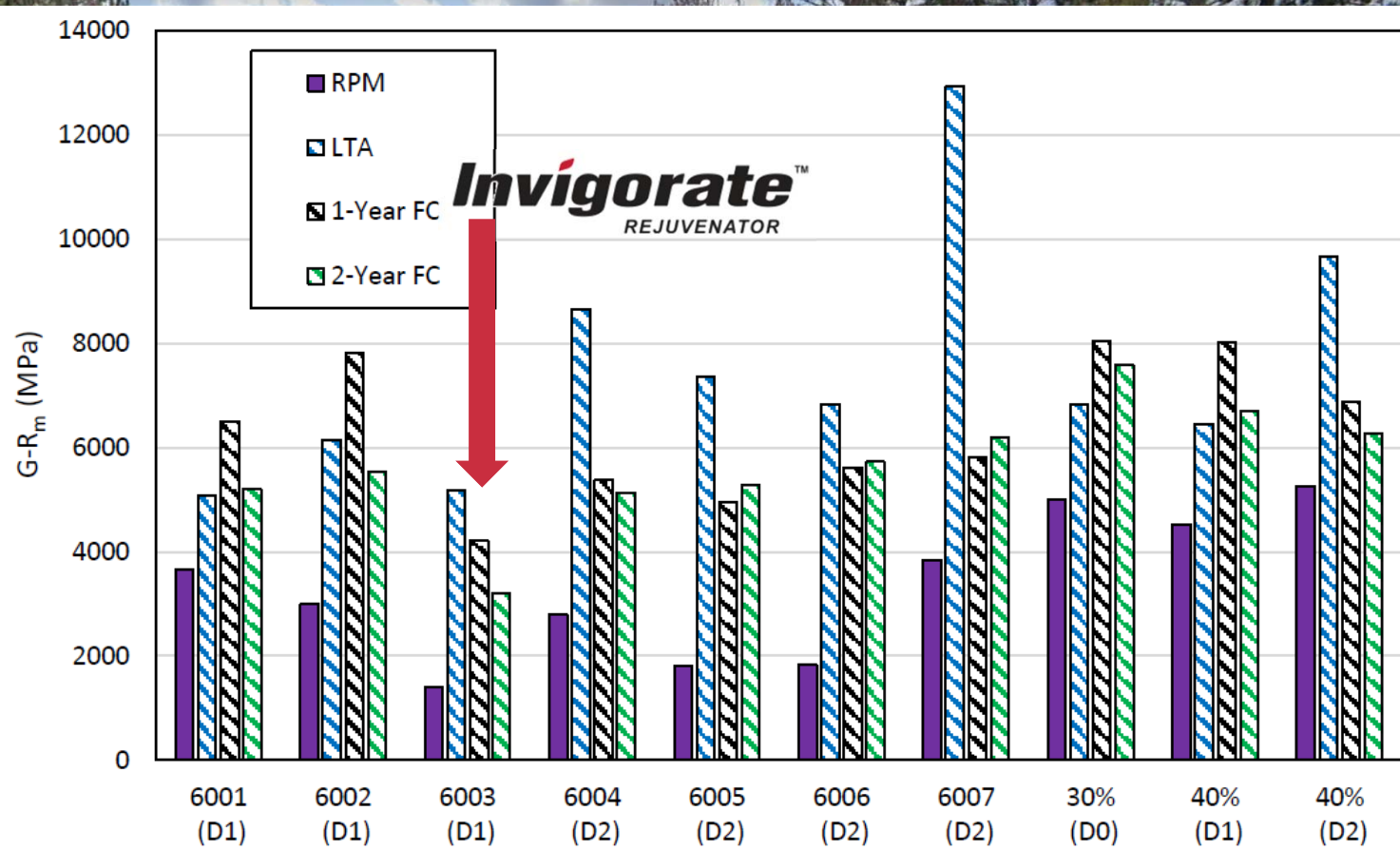


Figure 3-11 G-R<sub>m</sub> Parameter for 2-Year FC (Temperature=20°C; Frequency=5Hz)

Dvskdowp dw huldov ghv ljq #hvvhqwido | #lgguhvhvhwz r#suredhp v

### Cracking

- Brittle fatigue
- Low temperatures
- Many loadings
- Exacerbated by stiff binders



### Rutting

- Plastic deformation
- High temperatures
- Many loadings
- Problematic in pliable binders



Can Low Quality Asphalts be modified to prevent cracking without rutting?

Uhf | fdhg#Dvskdow#Sdyhp hqW#UDSv,



Ydfxxp #Wrz hu#Erwrp v#YWEv,

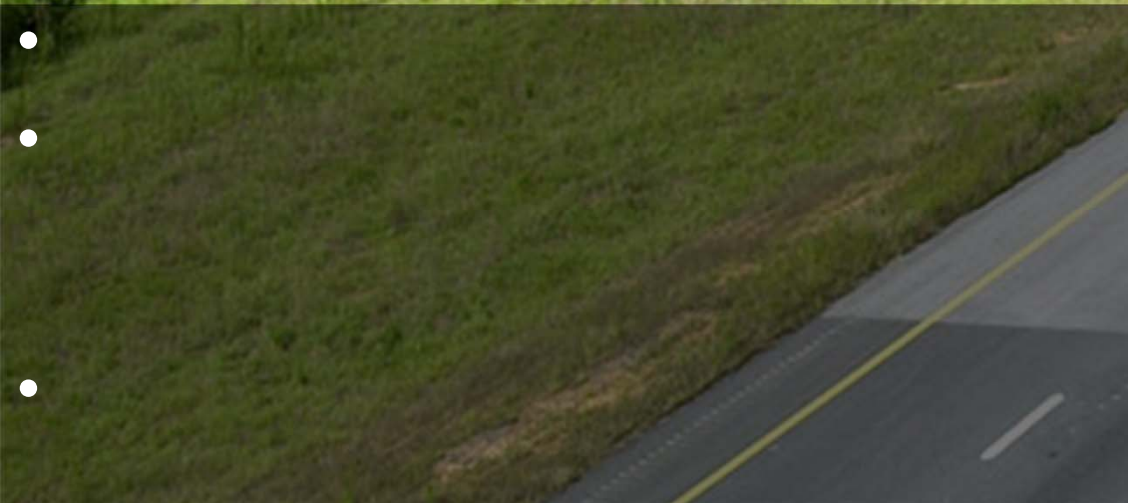


K.ljk#Shuirp dqfH#Sdyhp hqW



Sdyloj 0judgh#edvh#elgghu.





**Biomag**  
HOT MIX

National Center for  
Asphalt Technology  
**NCAT**

at AUBURN UNIVERSITY







- 40 % RAP (\$aving\$)
- PPA -spiked binder (70-22S)
- 5.4% BioM AG (totalAC basis)
- 1.8% Extra Rejuvenator

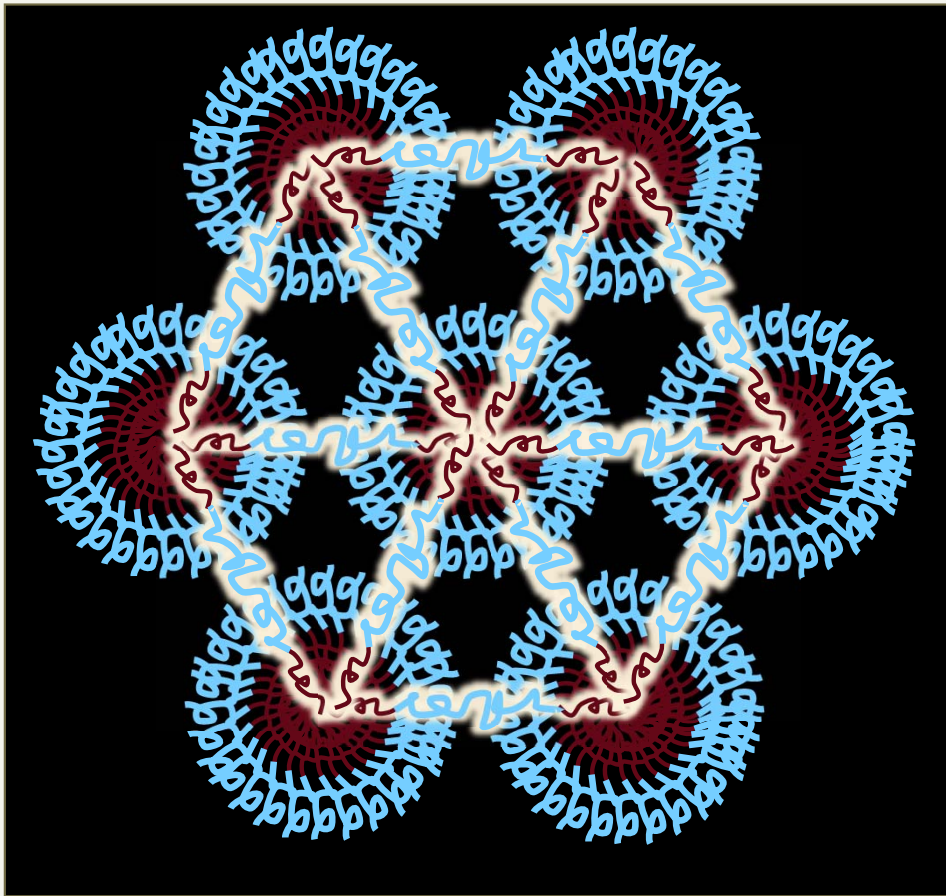
≈ 97K 05;

$\Delta T_c$  @ 05 #A# 08 #w# sdvv,

LIW #15 #A# ,

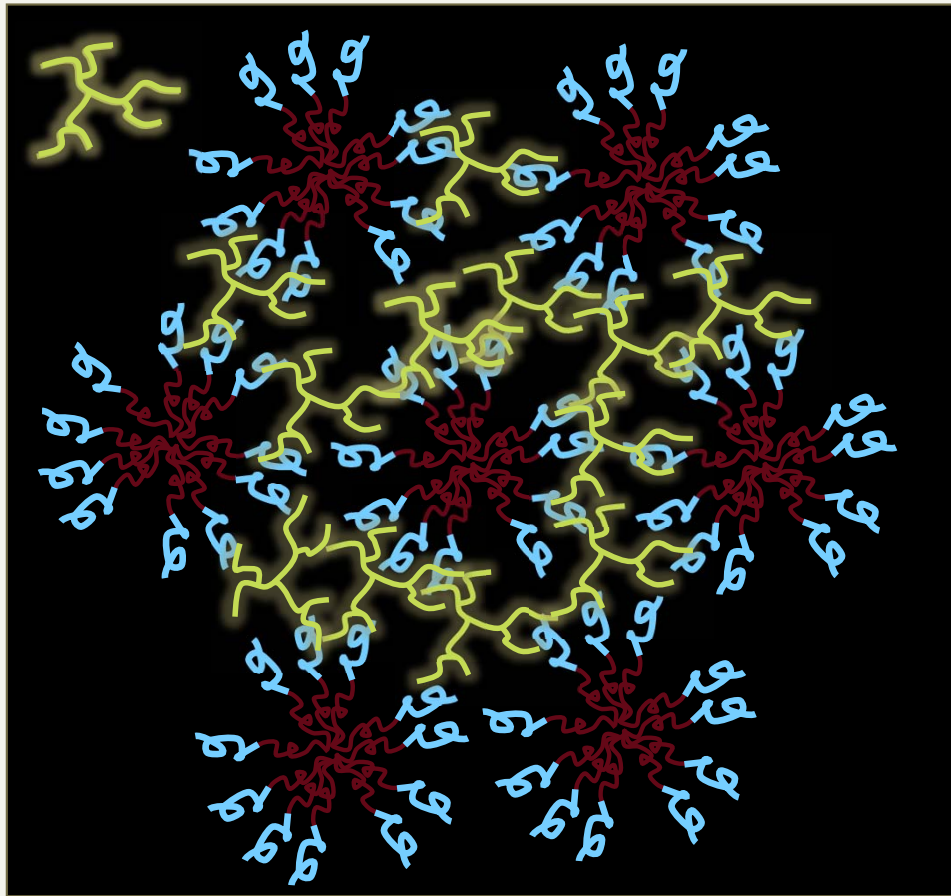
FW<sub>lggh</sub> { @ #155 #A# 3 ,

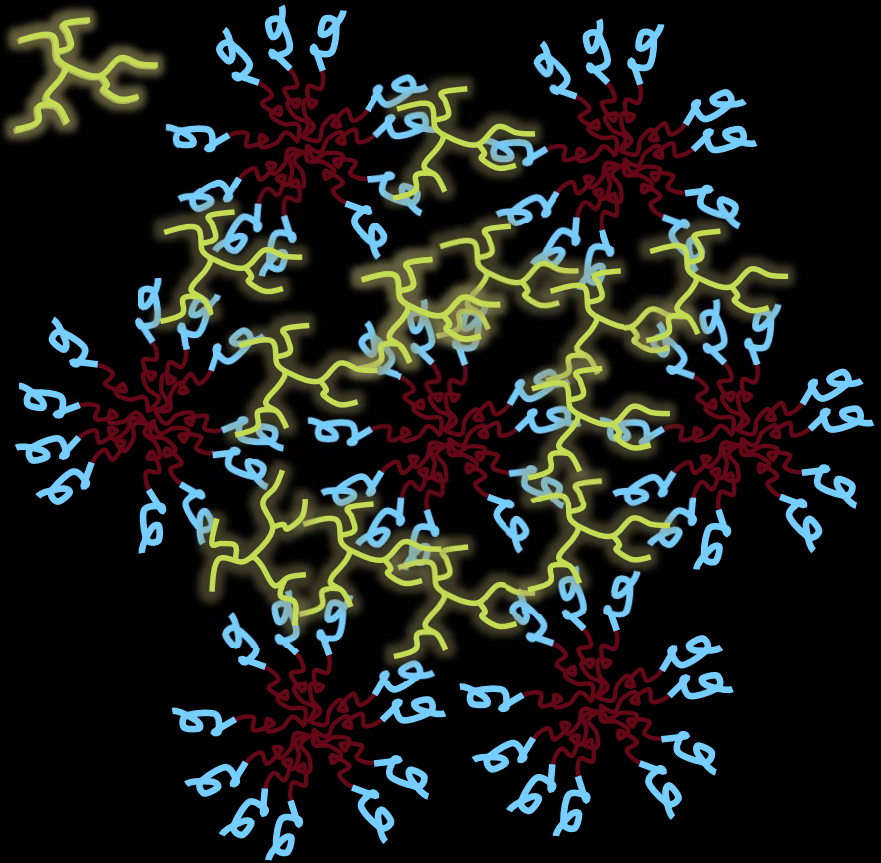
GFW # @ #387 #A# 733 ,



#### How does SBS work?

- High shear, high temperature disperses S domains ( $> 350\text{ }^{\circ}\text{F}$ )
- Self-assemble into network of B springs anchored by S domains
- This requires special mixers at special terminals...
- ... And time - at least 24 hours

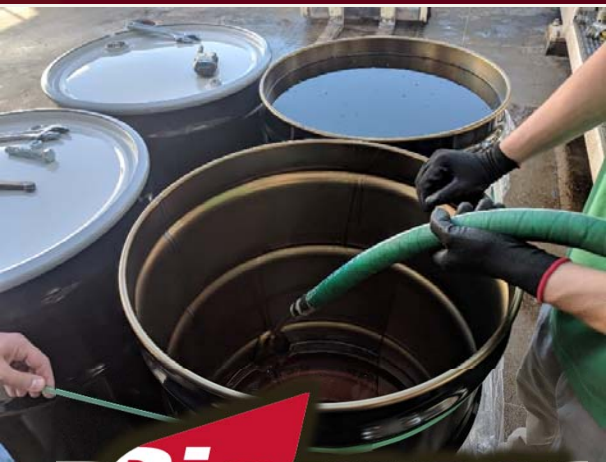




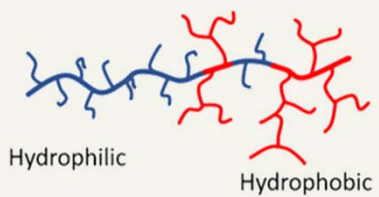
How does BioMAG Easy-PMAC work?

- Elastic network develops in the extruder barrel.
- Chemical connections between BioMAG and SBS amplify effectiveness.
- Add with gentle stirring at 300 °F
- Ready to use in 12 hours or less
- Over 50% more effective than high performance radial SBS.





**Bio mag™**

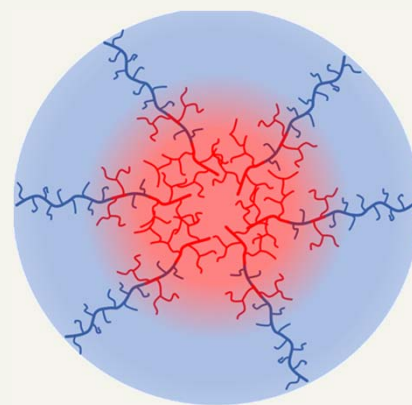
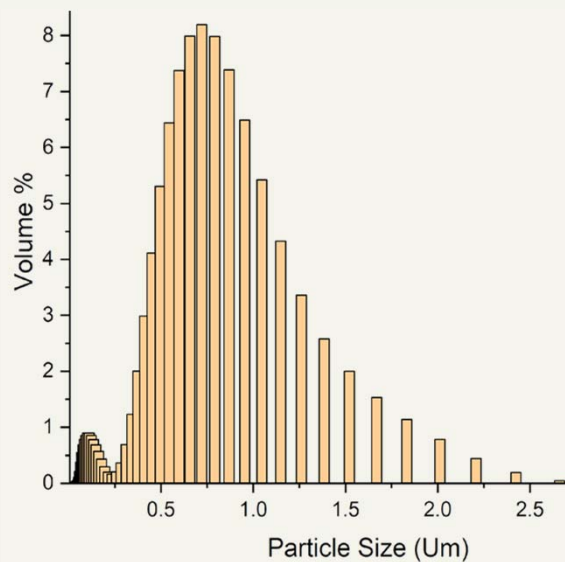


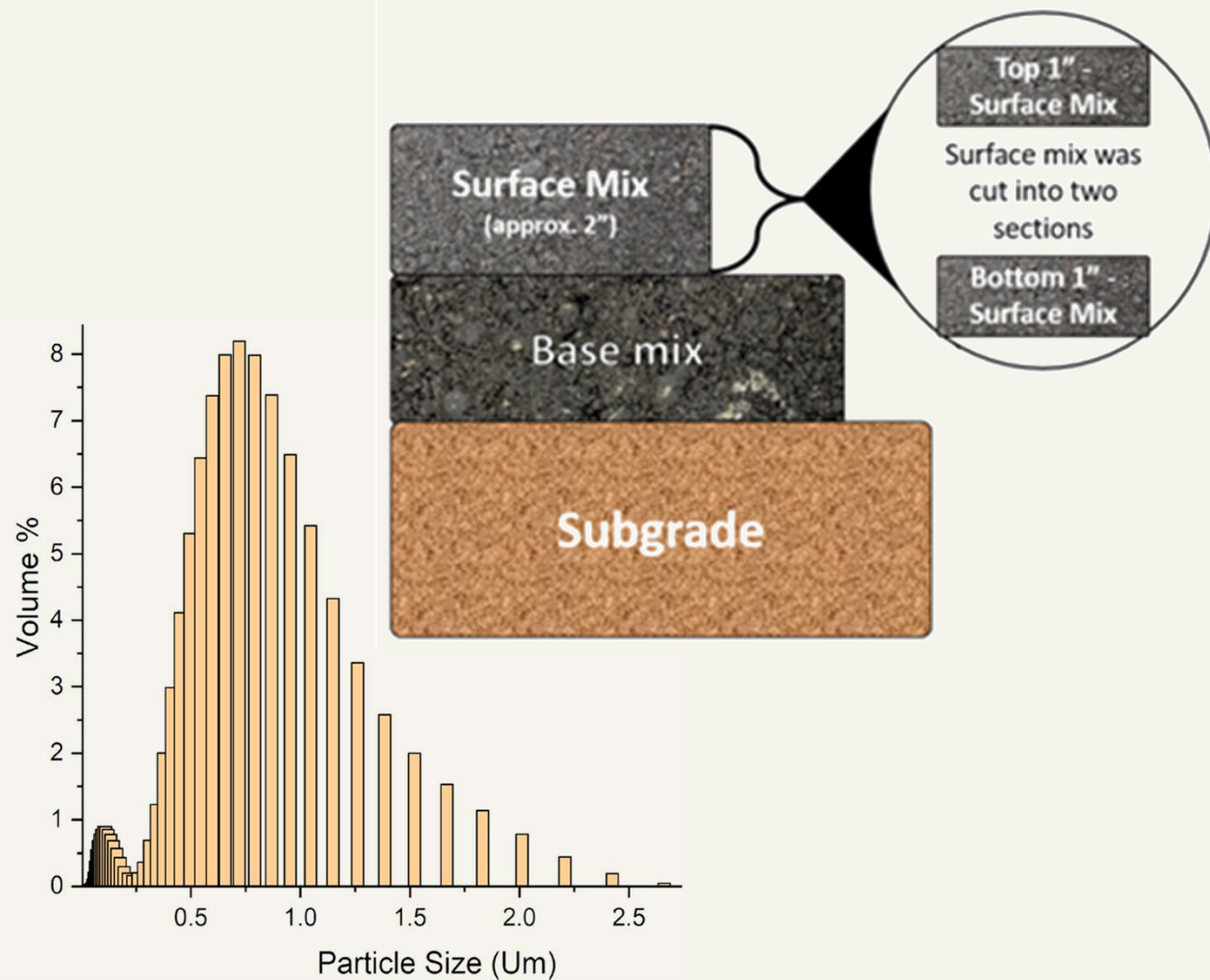
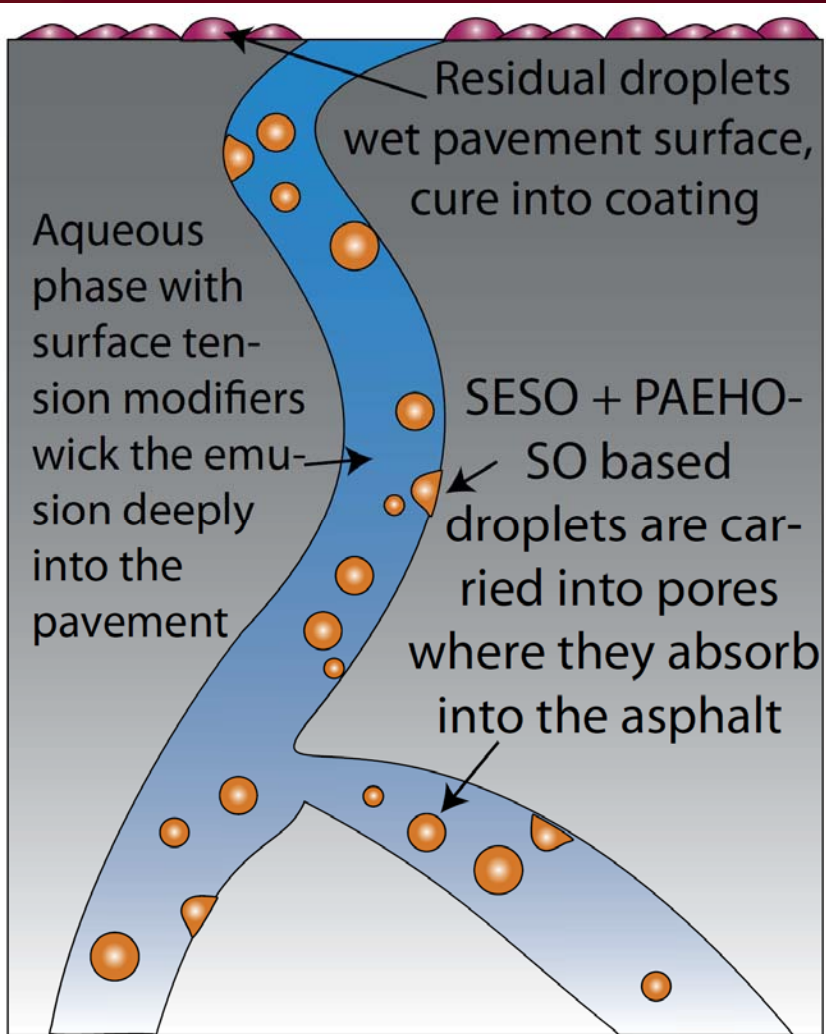
SDHKRVR#rsro|p hu

Z dwhu



Vkhdv





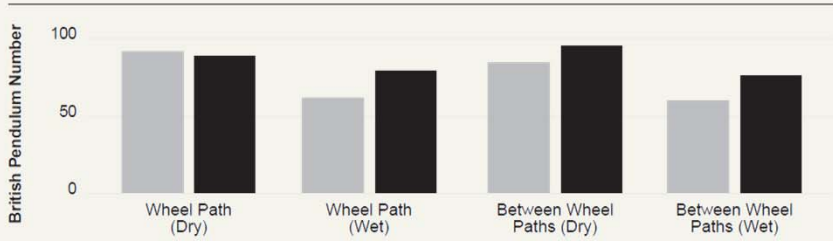


# Biomag™ : Maintenance and

TOPICAL+

**DRY TIME:** Pavements can be reopened within 2 hours of application.

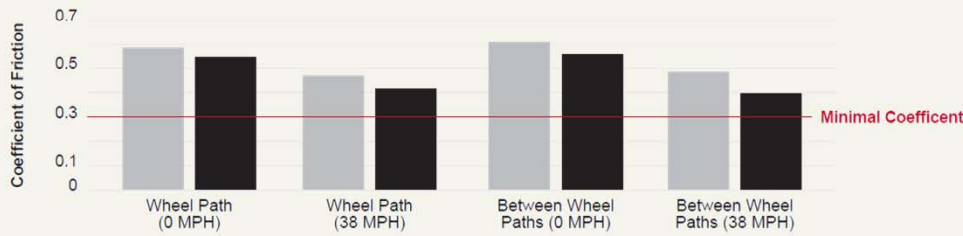
## SKID RESISTANCE



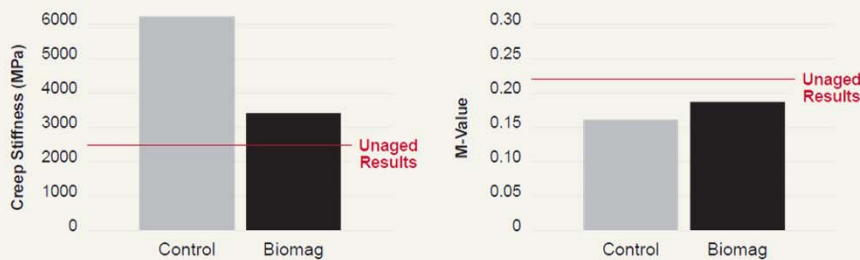
## KEY

- Control
- Biomag

## DYNAMIC FRICTION

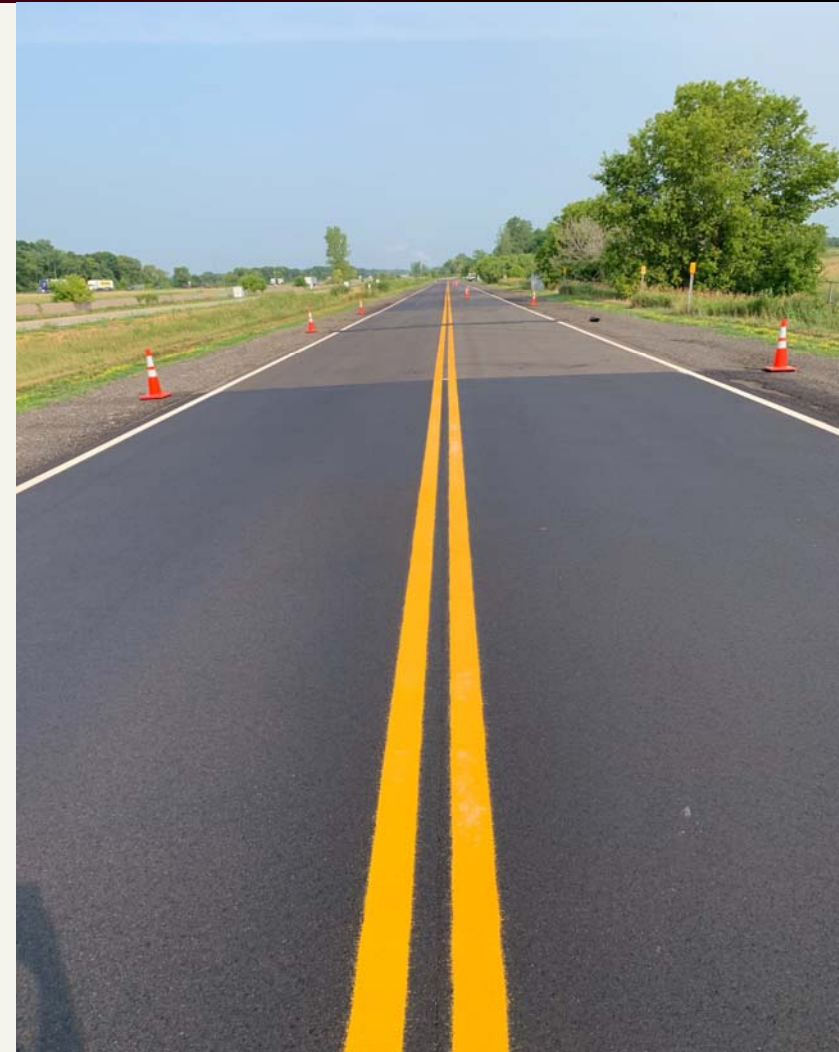


## PAVEMENT RHEOLOGY



## NOTE

The decrease in creep stiffness alongside the increase in the m-value demonstrates the treatment's ability to reverse the effects of aging while modifying the asphalt's molecular structure to the benefit of both the pavement and the user.







433 ( #JDS# 100jv



*Before Weber found Biomag Easy Pave, the lot at Ohio Mulch Supply was considered unsuitable for any kind of paved surface.*

**Biomag**  
EASY PAVE



433 ( #JDS# 100jv



**Biomag**  
EASY PAVE



**Biomag**  
EASY PAVE



433 ( #JDS# 100jv





433 ( #JDS# 100jv



Surfaces	PSI
No Binding Agent	5
Competitor A	45
Biomag Easy Pave	87
Asphalt Pavement	130



Core sample of the RAP millings that were treated with Biomag Easy Pave.

## THE DATA

Biomag Easy Pave held up just as well in the lab as it did underneath the fully loaded semi. The PSI values in the table below demonstrate the strength of the new surface, as well as its adherence against fatigue, cracking and rutting.

**Biomag**  
EASY PAVE



433 ( #JDS# 101jv



**FARM  
PROGRESS  
SHOW**



**IOWA SOYBEAN  
Association**







# THANK YOU!

IOWA STATE UNIVERSITY  
OF SCIENCE AND TECHNOLOGY

