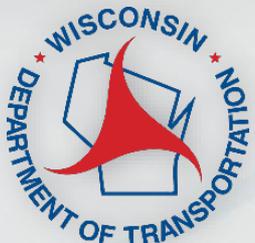


WHRP Updates

Erik Lyngdal & Dan Kopacz
Bureau of Technical Services

2019 WAPA Annual Conference
Pewaukee, WI

December 4, 2020



WHRP Introduction

Wisconsin Highway Research Program

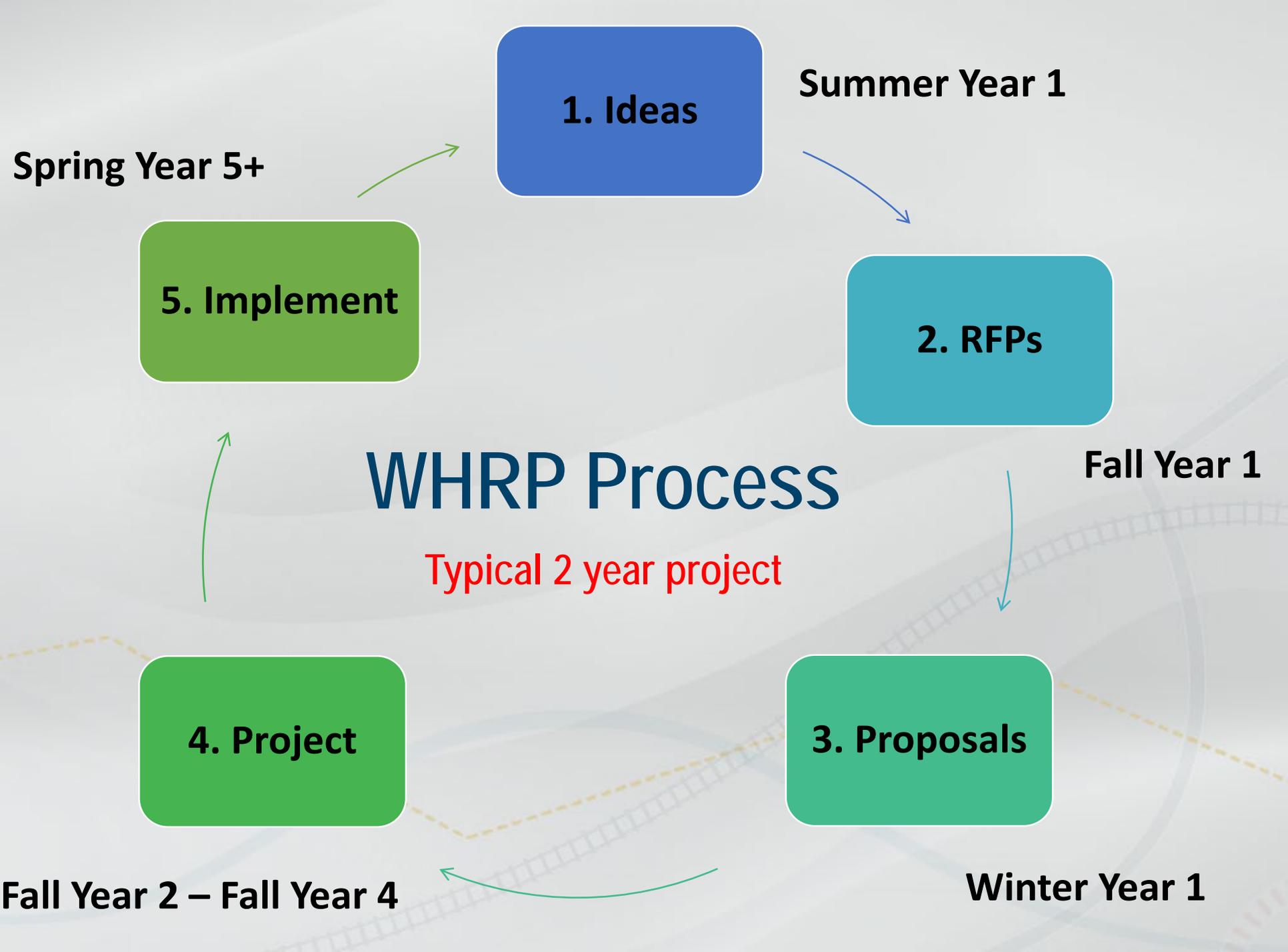
Wisconsin Highway Research Program Overview

- WHRP established in 1998 by the Wisconsin Department of Transportation in collaboration with the University of Wisconsin-Madison
- WHRP budget in FFY 2019 -- \$995,000
- Primary research areas
 - Flexible Pavements ◀
 - Rigid Pavements
 - Structures
 - Geotechnics

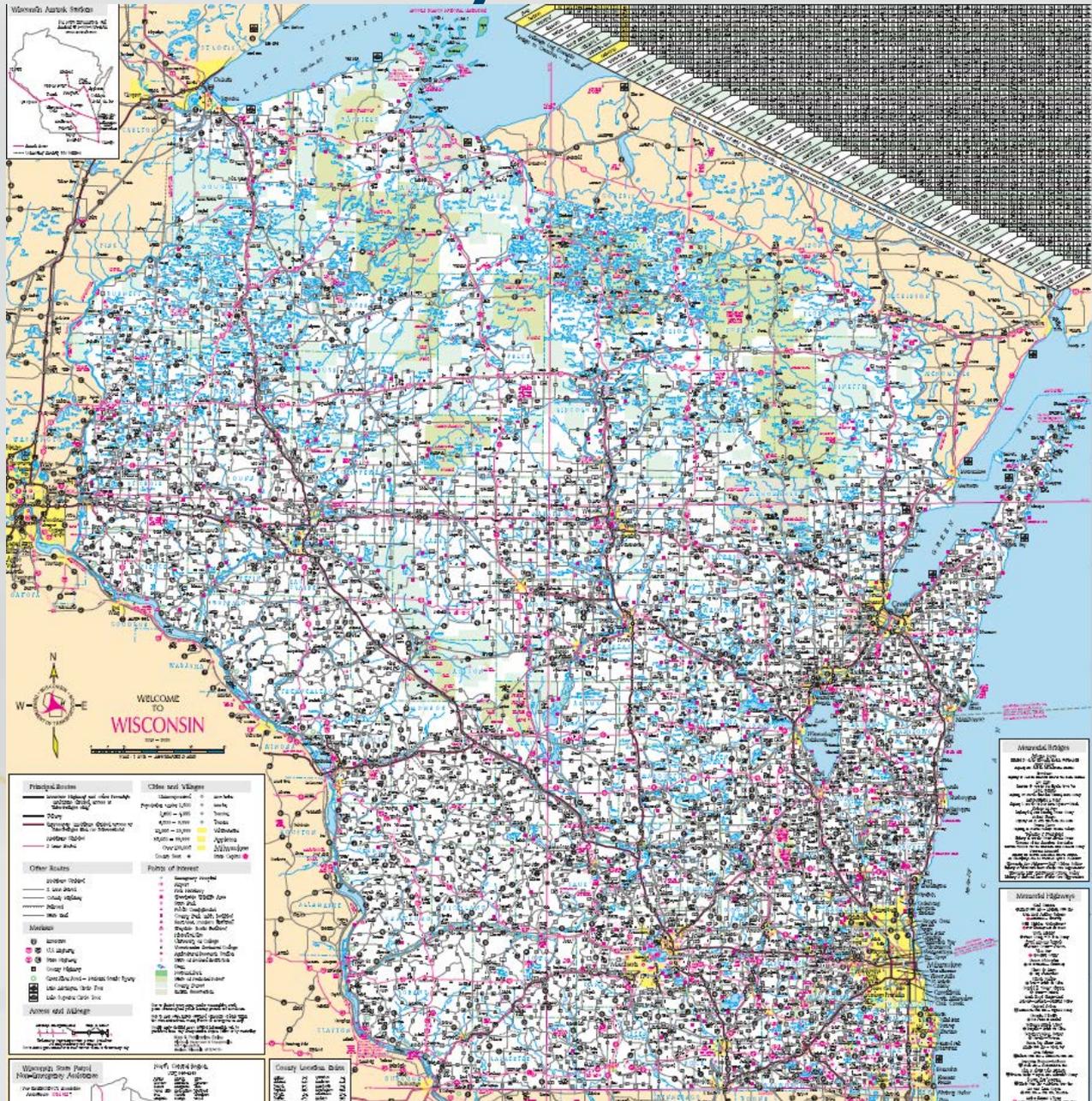
<http://wisconsindot.gov/Pages/about-wisdot/research/whrp.aspx>

Technical Oversight Committee

- Erik Lyngdal - DOT
- Steve Hefel - DOT
- Myungook Kang - DOT
- Tirupan Mandal - DOT
- Barry Paye - DOT
- Dan Kopacz - DOT
- Hani Titi - UW Milwaukee
- Danny Xiao - UW Platteville
- Aaron Coenen - FHWA
- Erv Dukatz - Mathy
- Stacy Glidden - Payne & Dolan
- Deborah Schwerman - WAPA
- Carl Johnson - Stark
- Signe Reichelt - Behnke Materials



Why WHRP?



Other Research Partners



MnROAD

Safer, Smarter, Sustainable Pavements Through Innovative Research

National Center for
Asphalt Technology
NCAT

at AUBURN UNIVERSITY

Research Categories

1. Project Delivery Challenges
2. Performance Testing
3. Emerging Technologies

Project Delivery Challenges

The background features a light gray gradient with several overlapping, semi-transparent wavy lines in shades of blue and yellow. A faint grid pattern is visible in the lower right quadrant, suggesting a technical or data-oriented theme.

17-06 Tack Coat



17-06 Tack Coat



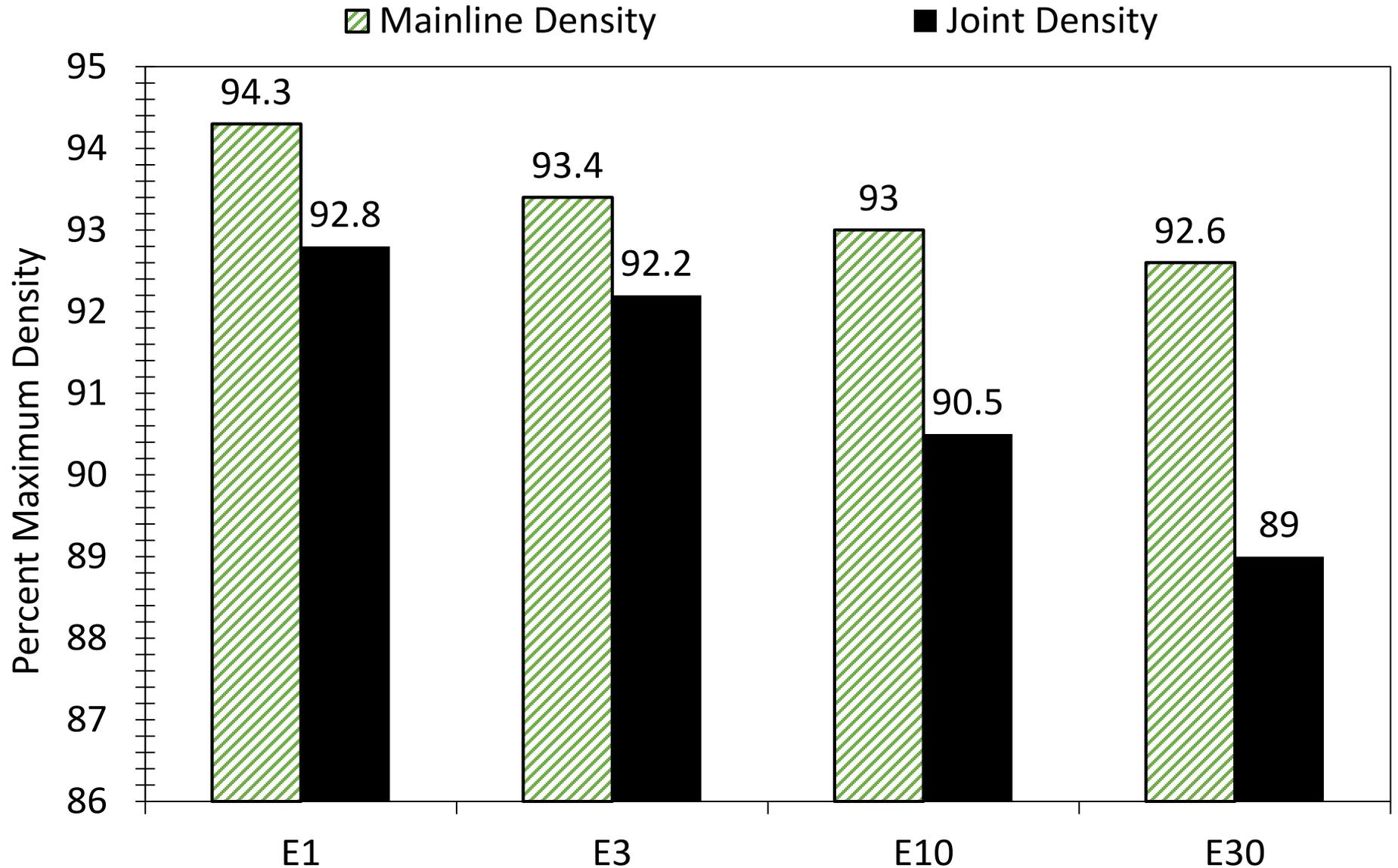
17-06 Tack Coat



15-09 Longitudinal Joints



15-09 Longitudinal Joint Density



Alternative Materials/Practices





Alternative Materials/Practices



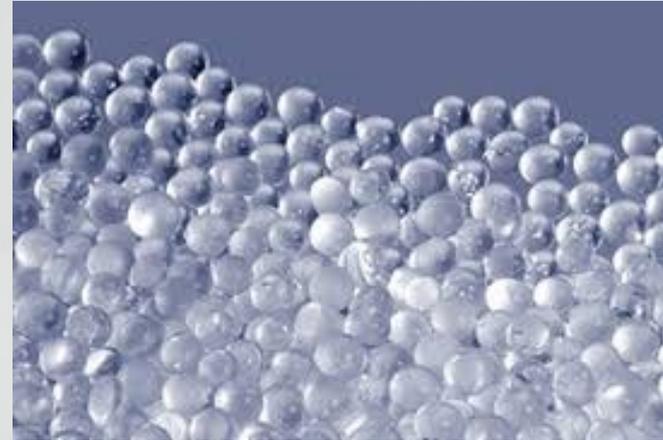
Performance Testing

The background features a light gray gradient with several overlapping, semi-transparent wavy lines in shades of blue and yellow. A faint grid pattern is visible in the lower right quadrant, suggesting a technical or data-related theme.

WHRP Project 14-06: Critical Factors Affecting Asphalt Durability



<http://www.interchem.at/produkte/strassenbau/bitumen/?lang=en>



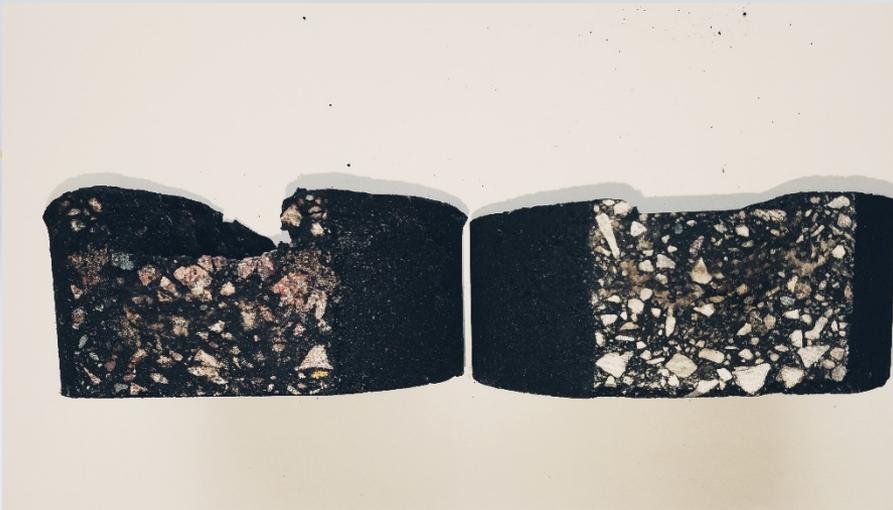
<http://generalpolymers.net/sbs.cfm>



<https://www.fhwa.dot.gov/pavement/recycling/rap/>



15-04 Analysis and Feasibility of Asphalt Pavement Performance-Based Testing



16-06 Regressing Air Voids



Increased asphalt binder → increased cracking resistance

20-04 Balanced Mixture Design Implementation Support

The background features a light gray gradient with several overlapping, semi-transparent wavy lines in shades of blue and yellow. A faint grid pattern is visible in the lower right quadrant, suggesting a technical or data-oriented theme.

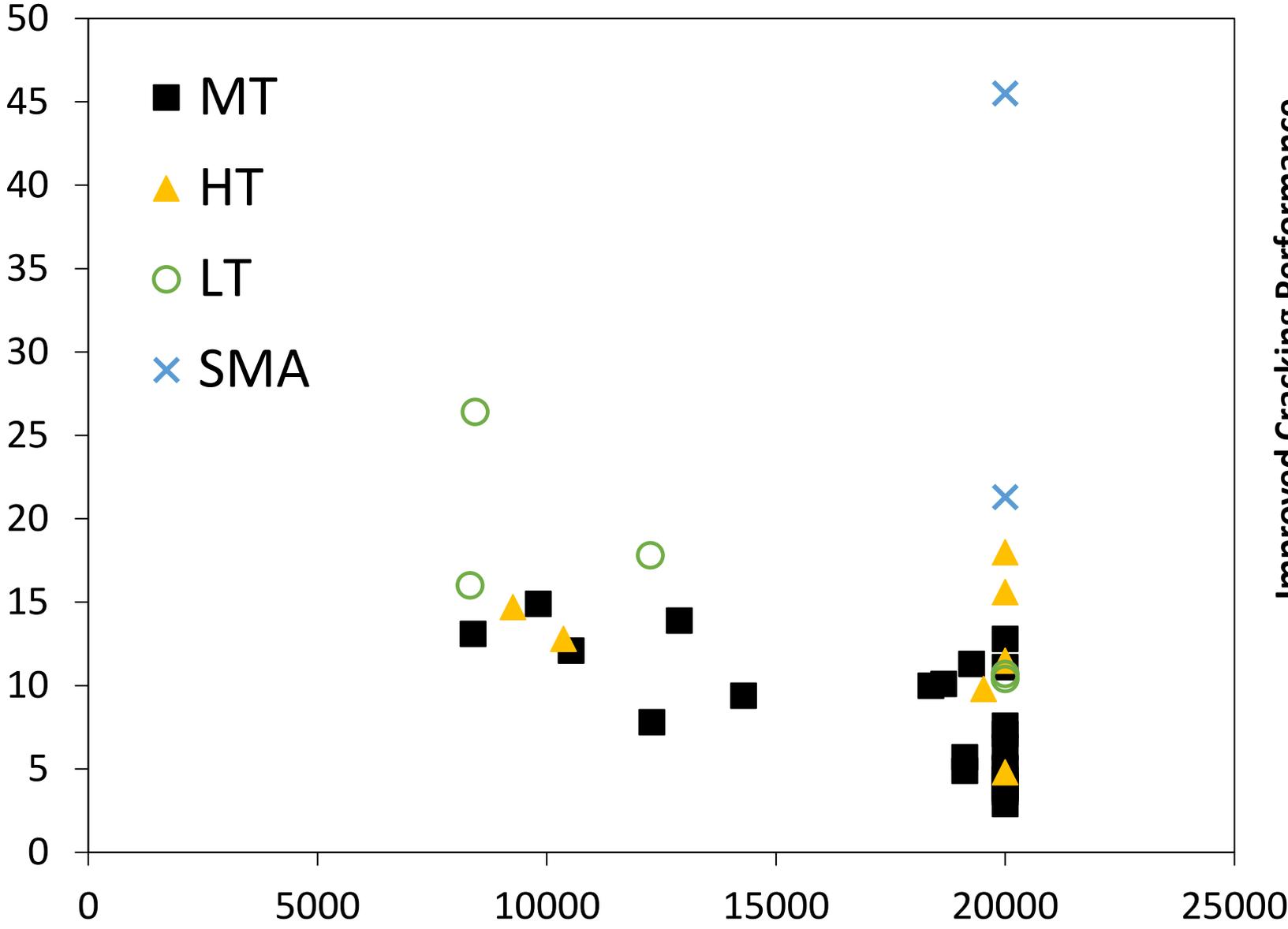
Improved Rutting Performance



Cracking Index

- MT
- ▲ HT
- LT
- × SMA

Improved Cracking Performance



Hamburg Wheel Wheel Passes to 12.5mm rut depth

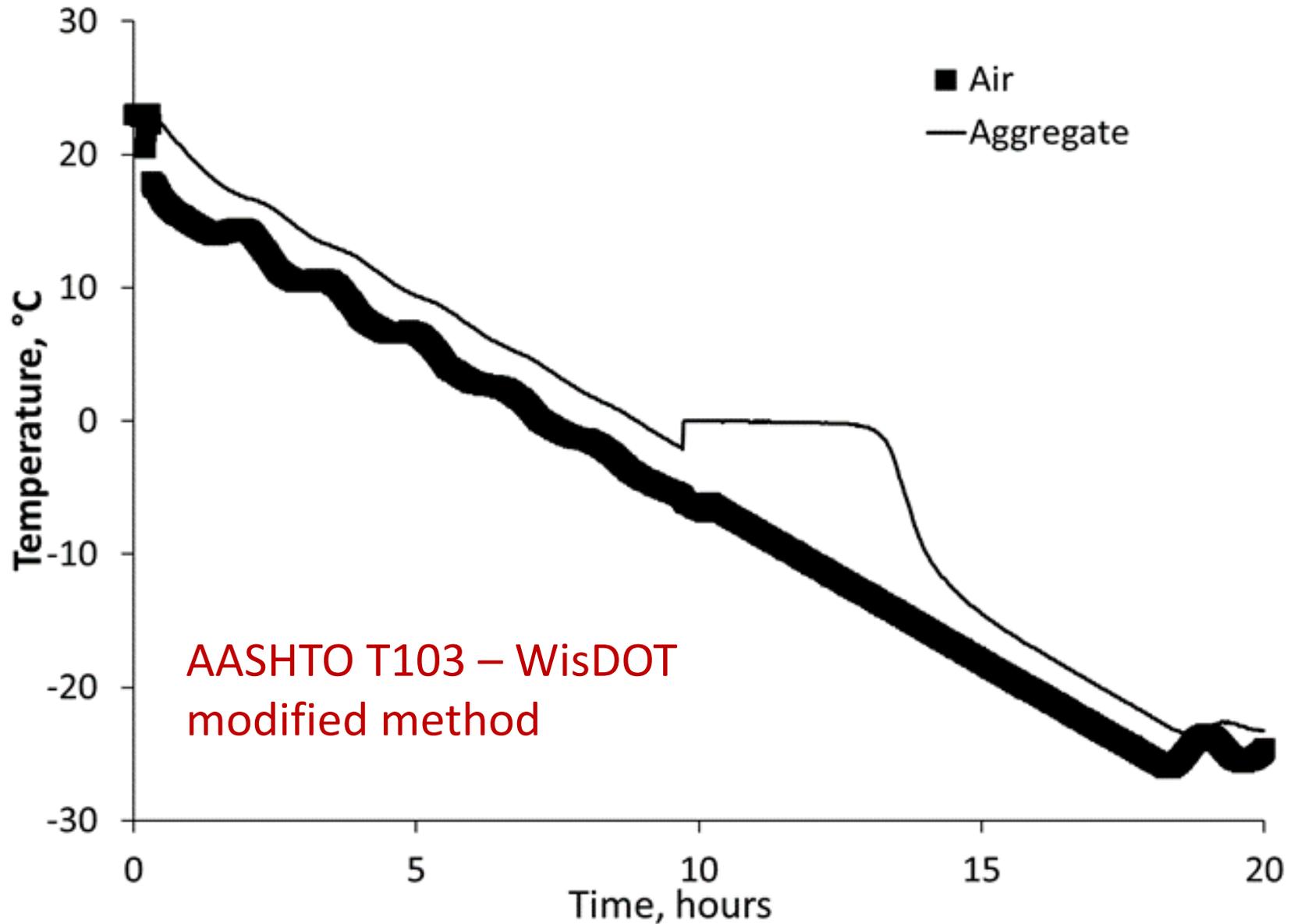
Emerging Technology

The background features a light gray gradient with several overlapping, semi-transparent wavy lines in shades of blue and yellow. A faint grid pattern is visible in the lower right quadrant, suggesting a technical or data-oriented theme.

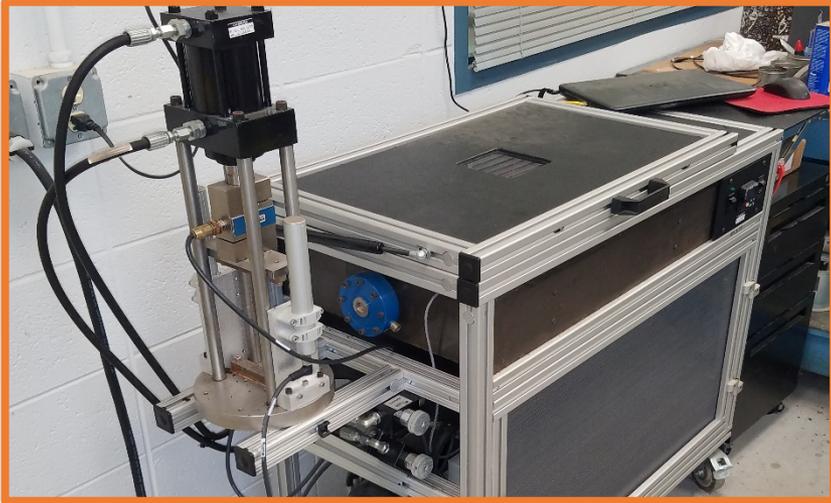
20-05 Aggregate Freeze-Thaw (Geo)



20-05 Aggregate Freeze-Thaw



Material Testing

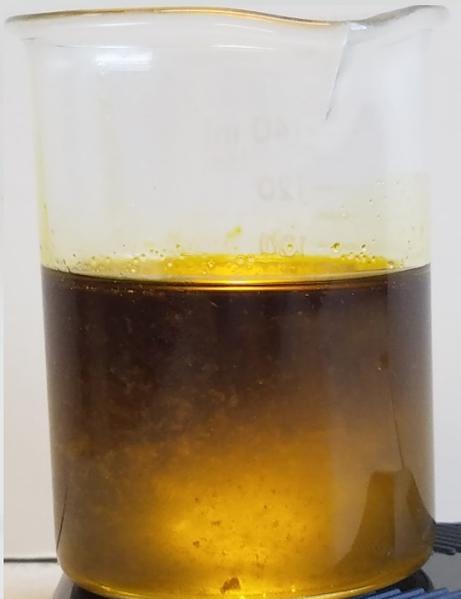


Recycling and Aging

10-06 Recommended recycled binder replacement

Recycled Binder Type	Maximum Binder Replacement ¹ , %	
	Surface Layers	Lower Layers ³
RAP ²	20	45
RAS	5	20
Combination of RAP and RAS	Reduce RAP binder replacement 4 % for each 1 % RAS binder replacement.	Reduce RAP binder replacement 2.25 % for each 1 % RAS binder replacement.

17-04 Field Aging and Oil Modification



19-04 Recycled Binders



19-05 Recycled Tire Rubber



19-05 Recycled Tire Rubber



Where is the rubber?



List of Active/recently completed projects

1. 20-04 Balanced Mixture Designs
2. 20-03 Expansion of AASHTOWare ME Design Inputs
3. 19-04 Recycled Asphalt Binder Study
4. 19-05 Rubber Asphalt Study for Wisconsin
5. 18-06 Enhanced Moisture Sensitivity Study
6. 18-05 Investigation of In-service Performance
7. 17-06 Investigation of Tack Coat Materials on Tracking Performance
8. 15-05 Evaluation of WisDOT QMP Activities and Impacts on Pavement Performance

Navigating to the Website



State of Wisconsin
Department of Transportation



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Welcome to WisDOT

- Madison West DMV moves January 22
- eNotify subscribers receive added level of identity security. Sign up for your account activity alerts.
- Calling all artists, age 7-17. Illustrate your vision of "Flight into the Future" for a chance to win an airplane ride!

All WisDOT news

DMV Service



Conduct business with DMV 24/7 without the need to visit a service center.

Travel Information



Get traffic information, incident alerts, travel conditions and updates on construction.

Email Reminders



Go paperless and receive renewal notices by email.

Principal Investigators, TOC Members, and Consultants



Principal Investigators, TOC Members, and Consultants

