WHRP Updates

Erik Lyngdal & Dan Kopacz
Bureau of Technical Services

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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
WHRP Process

Typical 2 year project

1. Ideas

2. RFPs

3. Proposals

4. Project

5. Implement

Spring Year 5+

Summer Year 1

Fall Year 1

Fall Year 2 – Fall Year 4

Winter Year 1
Why WHRP?
Other Research Partners

NRRA
National Road Research Alliance
Strategic Implementation Through Cooperative Pavement Research

MnROAD
Safer, Smarter, Sustainable Pavements Through Innovative Research

NCAT
National Center for Asphalt Technology at Auburn University
Research Categories

1. Project Delivery Challenges
2. Performance Testing
3. Emerging Technologies
Project Delivery Challenges
17-06 Tack Coat
15-09 Longitudinal Joints
15-09 Longitudinal Joint Density

Percent Maximum Density

Mainline Density

Joint Density

E1: 94.3% 92.8%
E3: 93.4% 92.2%
E10: 93% 90.5%
E30: 92.6% 89%
Alternative Materials/Practices
Alternative Materials/Practices
Performance Testing
WHRP Project 14-06: Critical Factors Affecting Asphalt Durability

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

http://www.fhwa.dot.gov/pavement/recycling/rap/

http://generalpolymers.net/vbs.cfm
15-04 Analysis and Feasibility of Asphalt Pavement Performance-Based Testing
Increased asphalt binder $\rightarrow$ increased cracking resistance
20-04 Balanced Mixture Design Implementation Support
Improved Rutting Performance

Improved Cracking Performance

MT
HT
LT
SMA

Cracking Index

Hamburg Wheel Wheel Passes to 12.5mm rut depth
Emerging Technology
20-05 Aggregate Freeze-Thaw (Geo)
20-05 Aggregate Freeze-Thaw

AASHTO T103 – WisDOT modified method
Material Testing
Recycling and Aging

10-06 Recommended recycled binder replacement

<table>
<thead>
<tr>
<th>Recycled Binder Type</th>
<th>Maximum Binder Replacement(^1), %</th>
<th>Lower Layers(^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAP(^2)</td>
<td>Surface Layers: 20</td>
<td>45</td>
</tr>
<tr>
<td>RAS</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Combination of RAP and RAS</td>
<td>Reduce RAP binder replacement 4 % for each 1 % RAS binder replacement.</td>
<td>Reduce RAP binder replacement 2.25 % for each 1 % RAS binder replacement.</td>
</tr>
</tbody>
</table>

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
Principal Investigators, TOC Members, and Consultants
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