



October NRRRA
Flexible Team
Meeting Minutes



Agenda



- Welcome and Introduction
- New Attendees
- MnROAD Construction Updates
- 2023 Call for Construction Update
- 2023 TRB meeting update
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- Research Pays Off
- NRRRA Project Updates
- Flexible Team Presentation:
“NCHRP 09-68 “Recycled Asphalt Materials: Binder Availability and Its Impact on Mix Performance”

Presented by: **Amy Epps Martin, PhD, PE, FASCE** | Professor
Zachry Department of Civil & Environmental Engineering
Senior Research Engineer | Texas A&M Transportation Institute



Thank You Glenn!!!

We Will Miss You!!!



New Attendees?

Edith Arambula - Texas A&M Transportation Institute





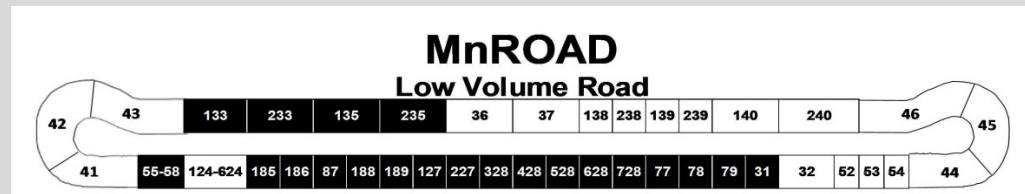
MnROAD Construction Updates



Ben - Construction is basically finished. The pavement marking has been installed including the test section lines. Doing initial monitoring. Switching back traffic on October 12th. Dynamic data collected for both asphalt and concrete sections. November 14 – 17 will be our next closure before the winter season. Material samples will be delivered soon.



2023 Call for Construction Update



Ben - Call for Construction Email was recently sent out. Looking for ideas for 2023 construction especially on the low volume road or other state or NRRRA member roads. If you have ideas write a 2-page proposal. Work with the different members NRRRA, MnDOT and staff at MnROAD to customize it to make sure we take full advantage of the space we have.

If your idea is selected, then write a 10-page proposal. Feel free to talk to people about this call for construction. Please reach out to anyone you know and feel free to pass this along to anyone.



2023 TRB meeting Update



Ben - Agency members have the opportunity to attend TRB with travel covered by NRRA – 2 trips/agency. Lisa will be sending information out very soon to all the Agency members once registration is open. NRRA Meeting is planned one of the nights.



Research Pays Off



Lauren - October 18: [Novel Methods for Adding Rejuvenators in Asphalt Mixtures with High Recycled Binder Ratios Project](#) Report presented by Fan Yin, Ph.D., P.E. and Raquel Moraes, Ph.D. of National Center for Asphalt Technology (NCAT)

See more on [Research Pays Off](#) or follow [our YouTube channel](#) for recordings.

You do not have to be an NRRRA member to watch Research pay off presentations. Can be forwarded to anyone interested.

As always, we welcome your ideas and topics for future webinars. Contact [Lauren Dao](#) to share your input.



NRRRA Project Updates



Ben – Team leaders who are working on the different projects please update project webpages to reflect what has been accomplished. Lauren and I will be developing a guide for the PI's and TL's.

Lauren - I have not heard from many PI's or TL's about any updates to the project pages yet.

Ben – There are two projects we were going to do, but delayed them. One was the perpetual pavement (freeze/thaw) project. This project had test sections built this year at MnROAD but the test sections in Wisconsin will not be constructed until next season. Would like teams to start working on RFP for this one.

Michael – We plan to send out a doodle poll to TAP members for a meeting to be held in October.



NRRRA Project Updates, Continued



Ben – The other project is the Recycled Binder Availability project.

Emil - Amy will be speaking about efforts that have been done nationally. My intention is to gather more members for the TAP. We only have four so far. Once we gain more members, we will set up a TAP meeting and start putting together the RFP. We have a draft needs statement that was prepared by Amy. Depending on our conversations maybe the scope for the RFP will change slightly.

Ben – NRRRA has got money set up for both projects so it is just a matter of when we would like to get things going on these projects.



NRRRA Project Updates, Continued



Lauren – A questionnaire/survey was sent out earlier on the project “Reclamation and Recycling Techniques to Achieve Perpetual Pavement Characteristics”.

Eshan – This project focuses on cold recycling and how the do perpetual pavement designs especially for a lot of these FDR type systems that are lasting so long. We sent the survey out to Agency members to see what other states are doing. Vr#du# rqo#knh#wlv#dyh#hvsrqghg1



NRRRA Flexible Team Presentation



NCHRP 9-68 “NCHRP 09-68 “Recycled Asphalt Materials: Binder Availability and Its Impact on Mix Performance”

Presented by: Amy Epps Martin, PhD, PE, FASCE | Professor
Zachry Department of Civil & Environmental Engineering
Senior Research Engineer | Texas A&M Transportation Institute

Dr. Amy Epps Martin has more than 25 years of experience teaching civil engineering materials courses and conducting research on safe, sustainable asphalt technologies at Texas A&M University and the Texas A&M Transportation Institute where she is a Professor and Senior Research Engineer. She received her education at the University of California at Berkeley.



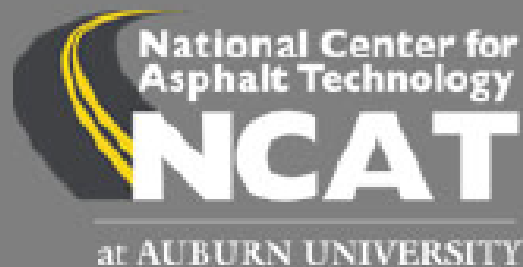
NRRRA Flexible Team Presentation, Continued



Amy – (Introduction) A research needs statement was submitted to both NRRRA and TRB committees. The NCHRP 9-68 was funded and started a couple of months ago. Would like to speak briefly on the workplan for this project since it is just getting started. I am speaking on behalf of the PI (Dr. Fan Yin – NCAT) and the rest of the NCAT team and The Texas Transportation Institute including Edith Arambula and Ramon Botella Nieto, a consultant from Spain. Also, the International Advisory Committee (IAC) and the Internal Advisory Group (IAG) made up of others from across the US focused on asphalt mix design and production with high recycled materials contents.

The next few pages include Amy's slides.

Thank You Amy for your excellent presentation!!!



NCHRP 09-68

**Recycled Asphalt Materials: Binder Availability
and Its Impact on Mix Performance**

NRRA Flex Team Meeting

October 5, 2022

Disclaimer: This investigation is being sponsored by TRB under the NCHRP program. Future results of the project will not constitute a standard, specification, or regulation.

Research Team



Fan Yin (PI)

Nam Tran

Carolina Rodezno

Chen Chen



Amy Epps Martin (Co-PI)

Edith Arambula



Consultant

Ramon Botella Nieto



International Advisory Committee (IAC)

Internal Advisory Group (IAG)

Background

- Use of recycled asphalt materials (RAM) provides significant economic and environmental benefits
- Asphalt mixtures containing high RAM contents could be susceptible to pavement cracking and durability issues
 - Heavily aged asphalt binder in RAM
 - Limitations with the volumetric mix design system to ensure performance
- Balanced mix design (BMD) has great potential to address these performance issues, but its implementation takes time
- In the meantime, state highway agencies and the asphalt pavement industry need short-term solutions

Background (cont'd)

- **Mix design strategies to improve cracking resistance of RAM mixtures**
 - “Tweaking” volumetrics to increase V_{be} (volume of effective binder)
 - Using a softer or better-quality virgin binder
 - Adding a rejuvenator
- **Another potential approach is to address recycled binder availability (RBA)**
 - Adjust mix design to improve cracking resistance by considering the presence of “inactivated” asphalt binder in RAM
 - Implemented by nine SHAs with promising preliminary results
 - Nevertheless, no systematic guidance on how to determine RBA and how to incorporate it into existing mix design and production practices

Project Objectives

Improve the mix design and performance of RAM mixtures by incorporating the RBA concept

1

Develop test method(s) to determine RBA

2

Evaluate the sensitivity of RBA to mix design and production variables

3

Determine the impacts of RBA on mix design, performance, and cost of RAM asphalt mixtures

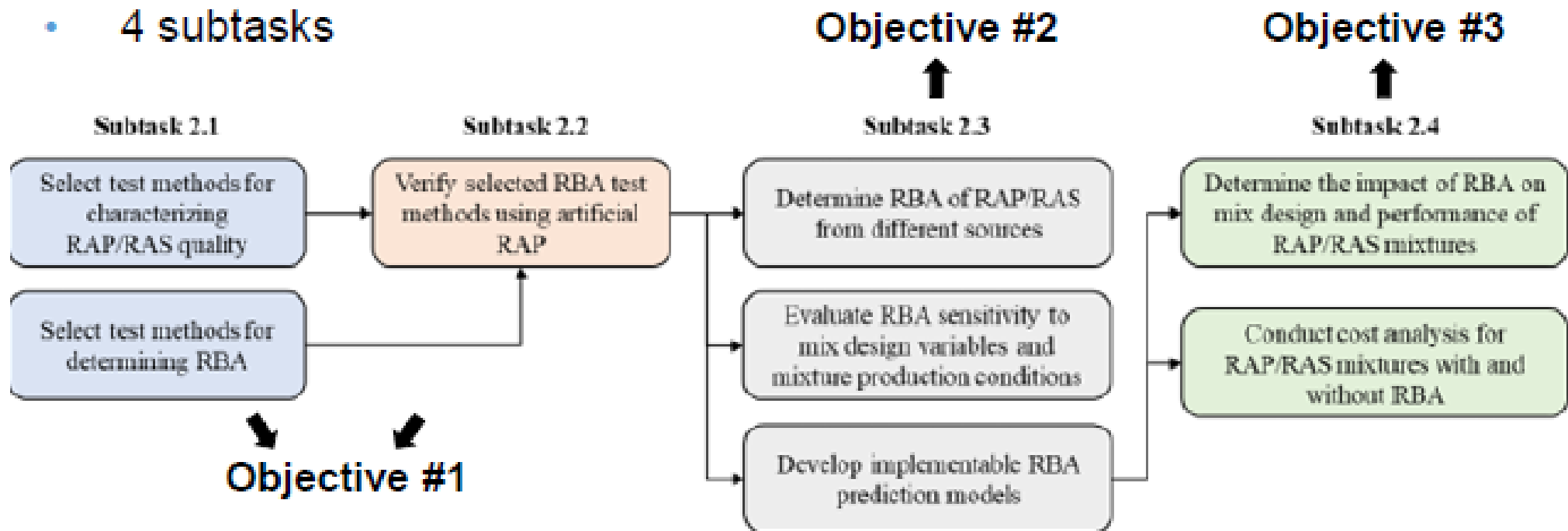
Research Approach

- **Phase I (6 months)**
 - Task 1. Literature review and survey of SHAs and international organizations
 - Task 2. Phase II work plan development
 - Task 3. Interim report

- **Phase II (24 months)**
 - Task 4. Phase II work plan execution
 - Task 5. Development of proposed AASHTO documents
 - Task 6. Development of implementation guidelines
 - Task 7. Final report

Task 2. Phase II Work Plan Development

- 4 subtasks



- Web-meeting(s) with IAC and IAG to collect feedback

Task 4. Phase II Work Plan Execution

Laboratory testing & data analysis to

- Select and verify RBA determination method
- Determine RBA of existing RAM mixtures
- Evaluate RBA sensitivity to mix design and production variables
- Develop RBA prediction models using machine learning, with three major inputs
 - 1) RAM property indicator(s)
 - 2) Significant mix design variables affecting RBA
 - 3) Significant production variables affecting RBA
- Determine impacts of implementing RBA



Task 5. Development of AASHTO Documents

- 1) Proposed test method for determining RBA of RAM mixtures
- 2) Proposed standard practice to implement RBA into mix design and determine its impact on mixture performance
- 3) Proposed revisions to R 35 and M 323 with supporting commentary



Project Schedule

- 30 months, 08/18/2022 to 02/17/2025



Year	2022					2023												2024					2025								
Month	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Task 1	→																														
Task 2																															
Task 3								X	X																						
Task 4																								X	X						
Task 5																															
Task 6																															
Task 7																												X	X		

X: panel review and meeting

Thank You

Questions?

See you again in November – Be Safe!!!

