

Meeting Minutes

Wisconsin Highway Research Program
Flexible Pavement TOC
WisDOT Truax Center
February 12, 1999

Call to Order

Meeting was called to order at 1:06pm by Len Makowski, committee chairman.

Meeting Minutes Approval

The committee approved the January 29, 1999 meeting minutes, and noted necessary revisions in the meeting attendance list. Phone/fax/e-mail addresses were updated. The following is a revised list of meeting attendees. These same attendees were at the February 12, 1999 meeting, with the exception of Wes Shemwell. Bob Schmitt arrived at 1:30pm.

Name	Representation	Phone	Fax	E-mail
Len Makowski	WisDOT	414-548-5618	414-548-6465	Leonard.Makowski@dot.state.wi.us
Tom Brokaw	WisDOT	608-246-7934	608-246-4669	Thomas.Brokaw@dot.state.wi.us
Hussain Bahia	UW-Madison	608-265-4481	608-262-5199	Bahia@engr.wisc.edu
Tom Amon	B.R. Amon and Sons	414-723-2547	414-723-2666	
Jack Weigel	Payne and Dolan	414-524-1732	414-524-1730	JWeigel@PayneandDolan.com
Judie Ryan	WisDOT	608-246-5456	608-246-4669	Judith.Ryan@dot.state.wi.us
Wes Shemwell	FHWA	608-829-7521	608-829-7526	Wesley.Shemwell@fhwa.dot.gov
Bob Schmitt	UW-Platteville	608-342-1239	608-342-1566	Schmitro@uwplatt.edu
Bill Poston, Jr.	Earth Tech	608-828-8154	608-836-9767	Bill_poston@earthtech.com
Jim Crovetti	Marquette Univ.	414-288-7382	414-288-7521	James.Crovetti@Marquette.edu
Erv Dukatz	Mathy	608-779-6392	608-781-4694	Edukatz@mathy.com

Update of Research Projects

1. Erv Dukatz summarized on-going research at the national level. A nine-page document from the NCAT website entitled, "Research In Progress," was distributed. The document itemizes on-going research by state.
2. Jack Weigel gave an overview of NCHRP 9-9, that is evaluating compaction methods for Superpave, Open-Graded Friction Course (OGFC), and Stone Matrix Asphalt (SMA). The study was initially scoped to evaluate Superpave, but OGFC and SMA were added during the study.
3. Bob Schmitt gave a brief update of NCHRP 10-39A "Testing Levels for Hot-Mix Asphalt Concrete Overlays." The following is a brief summary of this study not mentioned at the meeting:
 - a. Study completed September 1999
 - b. Final Report submitted to NCHRP and final publication is pending
 - c. Three primary areas of recommendations:

- 1) Contractor Quality Control Testing
 - Statistical models were developed to aid contractors in measuring and identifying where significant sources of variation can be found in plant production and field compaction.
 - An application of the models concluded that variation between days is a significant source of overall variation for both the plant and compaction processes. This suggests that contractors should conduct routine daily testing, as opposed to high levels of testing on intermittent days.
 - Testing variation is approximately 15 to 30% of total project variation. The remaining variation is assigned to natural material variation, sampling, and external production changes.
 - An equation was developed to determine the average pavement density with a reasonable level of confidence.
- 2) Acceptance Testing
 - Percent Within Limits (PWL) statistical acceptance plans were analyzed, and it was determined that acceptance risks of both the agency and contractor increase with smaller samples sizes.
 - The rate of decrease in risk is substantially less for samples sizes of $n=8$ and larger, suggesting that an appropriate lot size is $n=8$ (plant mix tests and density tests).
 - A methodology was developed to determine lot sizes by individual states using actual field data.
- 3) Verification Testing
 - Agency verification of contractor acceptance tests were evaluated for both split samples and independent samples.
 - Split sampling requires less agency testing than independent sampling for equivalent parameter of interests, such as difference between tests and probabilities of correctly detecting a true difference between tests.
 - An equation and methodology were developed to determine the number of agency verification tests per lot based on several input parameters, such as variation between contractor and agency tests, allowable difference between contractor and agency tests, and statistical probabilities of making a correct or incorrect decision.
4. Hussain Bahia summarized three research studies:
 - a. Tensile Strength Ratio (TSR)
 - Recently completed.
 - Recommendation is to have the TSR test optional for Superpave.
 - Wet strength is a function of dry strength.
 - b. Hwy 53
 - Completed May 1999.
 - Estimated pavement temperature using measurements in air temperature.
 - There was general agreement between lower pavement temperatures and lower air temperatures, however, the opposite was found at higher temperatures.
 - Pavement temperature is a function of air temperature and solar radiation.
 - c. Layer Coefficient
 - Project was extended twice.
 - Two of three tests included Resilient Modulus and Rutting.
 - There were varying results with SMA mixes and somewhat favorable results for MV and SHRP. The SHRP results were better than those of the MV.

Current WisDOT Research Proposal

1. Hussain Bahia distributed a research proposal entitled, "Field and Lab Evaluation of Superpave Mixes Designed With Different PG Grades and Aggregate Angularity."

2. This proposal was a modification of an initial research proposal submitted to the Council On Research (COR).
3. The objective of the study is “to quantify the effects of varying PG grades of binders and the effects of varying the angularity of natural sands on the compaction and performance of asphalt concrete mixtures typically used in Wisconsin.”
4. There was discussion of whether the difference in PG-58 and PG-64 is 6 degrees, or whether there exists substantial variability that may reduce this difference. Is the 6-degree span sufficient?
5. Tom Amon stated the need for a field component of this study.
6. Proposed experimental factors in the study include 2 PG grades, 4 to 6 sands, and 6 projects.
7. Lenny Makowski noted that the Lake View Parkway project in District 2 allows the resident engineer to change PG grades for evaluation purposes.

Laboratory Inventory

1. Committee members discussed their laboratory equipment inventory.
2. Bob Schmitt distributed a copy of construction materials testing equipment at UW-Platteville. This inventory does not include equipment used by the Wisconsin Highway Technician Certification Program, directed by Keith Lunden.

Finalizing Research Problem Statements

Fourteen research problem statements were discussed. Problem Statements #1 through #8 were formulated at the January 29th meeting, while #9 through #14 were added at this meeting.

1. Change in density behind cold roller
2. Pavement thickness / mix type / maximum aggregate size
3. Monitor existing pavement
4. Full-depth pavement
5. Temperature variation in pavement during construction
6. Binder selection
7. Mix designs – constructability
8. Structural coefficients for different subgrade conditions
9. Reflective cracking
10. Match compaction levels of LV and MV to gyratory compaction.
11. Adjustments in $N_{initial}$ based on traffic loads
12. International Roughness Index – evaluate other equipment to address the difference between asphalt and concrete surfaces
13. Demonstration project to compare blanking band differences
14. Identify structural coefficients in existing layers in overlay design

The above research problem statements were then reorganized and combined to produce a list of five top-priority research problem statements. The following list shows these statements and the committee member designated to draft the statement. Initial drafts will be submitted to Lenny Makowski. Lenny will send out a ranking survey to the districts to solicit their input and identify top-priority research needs.

- Tom Amon #1 and #5
- Tom Brokaw #6
- Judie Ryan #10
- Erv Dukatz #2 and #7
- Bill Poston #8

Future Meetings

1. Future meeting dates are:
 - a. Thursday March 11 at 2pm
 - b. Thursday April 8 at 2pm
2. Meetings will be held at WisDOT Truax Office unless changed by the committee members.

Meeting Adjournment

The meeting was adjourned at 3:06 pm.