July 31, 2024
Meeting – Performance Subcommittee

Location:	Teams Meeting and SW Region Office Sauk Conference Room
Date:	July 31, 2024
Time:	10:00AM – 12:00PM

Attendance

- Dan Kopacz
- Casey Wierzchowski
- Albert Kilger
- Debbie Schwerman
- Cheng Tao
- Andrew Hanz
- Matt Andreini
- Scott Syron
- Carl Johnson
- Derek Frederixon
- Jake Amundson
- James Pforr
- Zach Lemke

Agenda Items

1. BMD 2023 Analysis Update
    - Recapped where this data came from.
        - QV split samples with QC, primarily PWL projects, but some QMP as well to get lesser used mixes.
        - 2023 was focused on acquiring data for less frequently used mixes.
    - Presented results.
        - All results shown are using QV results, except the bias charts comparing WisDOT to the contractor results.
        - Carl J.: Add bands to the bias charts that use an established d2s, or a WisDOT determined d2s. The data likely falls within the bands.
            - WisDOT has been regularly checking for nationally established d2s values. WisDOT has also calculated its own d2s value in the meantime. This will be discussed further in the Round Robin results.
            - NCAT Round Robin will begin soon using mix that has rut depths in the 4-8mm range. This may help establish more accurate d2s values compared to samples that have very little rutting that have reportedly been used in the past.

- Cheng T.: When WisDOT says they are targeting regions [in reference to performance testing mix selections], is WisDOT also trying to target different aggregate materials - some regions use finer mixtures than others, some aggregates are denser than others, etc. because of material variability?
  - Dan K.: Not really. That will play out in the wide selection of projects sampled. Primarily targeted mixture types (i.e.: 3 MT 58-28S)
    - Results this year may be skewed by targeted project selection to collect data on infrequently used mix types for which there is little data available.
    - Cheng T.: Is WisDOT collecting data on No. 2 and No. 3 mixtures [mixtures used in lower layers - since the primary initiative is for surface mix] for information purposes?
      - Dan K.: Yes, for information purposes only right now. WisDOT is some time away from implementing a spec. There are still many issues to resolve including comparing between labs, creating an acceptance spec, etc.

2. Review Round Robin Results
   - Recapped the Round Robin
     - Mixture type tested was a 4 MT 58-28S, identified as sample 2024-A. The sample was collected on 10/10/2023, and labs were instructed to follow the BMD Sample Preparation 07-2023 procedures when testing.
   - Results presented.
     - Labs included WisDOT, 3 contractor labs, and 1 consultant lab.
     - One issue is the small number of labs contributing to the dataset (5 labs). Due to the small dataset, instead of determining a standard deviation of the material and using that to reject outlier labs, the standard deviation is wide and inclusive of all the labs' results. Therefore, we cannot detect outlier labs using either Z-scores or interquartile ranges.
     - Andrew H.: There seemed to be issues with sample segregation. It took a few attempts to get things to match up in terms of air voids.
       - Dan K.: When issues like that come up, it's good to get a gradation.
         - **Action Item:** WisDOT will review requiring gradations on Round Robin samples going forward.

3. Review Sample Preparation and Handling Document
    - Erik L.: Could bring the material handling procedure to AASHTO Comp. to review our procedure since their procedure seems to behind ours in terms of reducing inter-lab variability.
    - Mathy has done some comparison testing between their own internal procedures and WisDOT procedures and the data compared well.
    - There are concerns about the sensitivity of mixes to aging and how that translates to real world performance. Do performance values rapidly deteriorate once in service? Do minor changes in production have significant impacts on real world performance, like silo storage time.
    - Andrew H: What is the purpose of the limits during design if the purpose of the SPV is to get data from design to production? Could just use the SPV to do the tests for information only.
        - The limits exist primarily to encourage modifications to designs that may not meet the requirement originally and to learn what types of changes would need to take place in order to meet a limit.
        - Erik L.: If they aren't meeting the requirement, are there volumetric relaxations we can allow that would help the design meet the requirement?
            - Dan K.: Yes, this is something we would considering accommodating, but it is impossible for WisDOT to know that everything had been tried to meet the limit.
    - James P.: The handling procedure could likely further reduce variability between labs if there is a timeframe in which the sample should be tested, i.e. within 2 days of sampling.
        - Matt A.: Depending on the number of samples, right now that isn't possible with current equipment and staffing to guarantee such a short turnaround time. Eventually this might be possible to do.
            - James P.: Recommend recording sample date and date tested.
                - **Action Item**: Add both dates on the contractor worksheet, if not already implemented.
4. Review BMD SPV Updates
    - Andrew H. SPV is written based on a lab mix design. There is a lab vs. plant mixture component. Consider approving the design based on plant mix. This is done in MN.
        - Cheng. T.: Could verify performance during a test strip on plant mix.
        - Erik L.: There are differences between the lab and field results. We saw this with NCAT's study on STH 69.

    - James P.: NCAT research did PWL on IDEAL-CT and HWTT. IDEAL-CT easily exceed the limits and frequently had a 100 PWL, meanwhile HWTT almost always had a 50 PWL.
    - **Action Item:** WisDOT will continue to investigate differences in performance test results between lab mix designs and plant production of the same design.
- Andrew H. RE the SPV BMD limits, one issue is the BMD HWTT limits for mix designs seem to be controlling the optimum AC content. This will result in mixes with lower AC.
    - For softer binders, 52-34, Iowa allows running the HWTT at 40C.
    - There are also differences between lab batched samples at 7% Va, while in the field the voids will vary.
- Cheng T.: Is WisDOT looking into past projects performance to field validate the performance results?
    - WisDOT: We will be soon. We are preparing the database with the sample coordinates and underlying layers to coordinate with the survey unit on data collection. We are now approaching the timeframe where we can begin to expect early distresses that can be measured. There are also test sections from research projects.
- Cheng T.: Does WisDOT plan on going back to the old analysis for HWTT using Passes to Failure/SIP/Rut depth at test completion? Other states don't seem to be using this analysis method.
    - WisDOT: Not at this time. The CRD and SN analysis help us isolate the rutting from the stripping which has helped in comparing between labs.
    - James P.: NCAT's research showed this analysis had lower COVs, however seeing that they were higher during our Round Robin is concerning and should be monitored.
- Andrew H. Proposes tabling the SPV for next year and having another meeting to discuss it in terms of how its used on projects and which projects will use it and what the goals are of the SPV.

5. BMD Project Selection
    - Dan K.: Maybe sample 10 mixes across the state and send them to all 5 labs
6. Research
    i. Current Research
        - CAPRI
            - Lag/Dwell experiment
                - Determine if differences exist in performance results when samples have been sitting, untested, for

days/weeks/months.
        - Tested on loose mix.
    - Compare HWTT to HT-IDT
- NRRA
    - Standardization of SIP Calculation for Hamburg Wheel Tracking Test
    - Field Validation of Warm Mix Asphalt at Reduced Production Temperatures for Balance Mix Design

ii. Research Needs?

- Jake A.: Can we look at the HWTT replacing the TSR using the SIP?
    - **Action Item:** WisDOT will look into correlating SIP/LC_{SN} to TSR values.

7. Next Meeting?
    - Will try to hold another meeting soon. Details TBD.