



Midwest Bridge Preservation Partnership

Agenda – Monthly Teleconference

February 4, 2020

1:00 – 2:00 PM CST

- Roll Call –

Name	Organization		Name	Organization	
Darlene Lane	NCPP	x	Javier Romero	Cook County, IL	x
Ed Welch	NCPP	x	Adam Post	Indiana DOT	x
John Hooks	NCPP	x	Scott Neubauer	Iowa DOT	x
Chris Keegan	NCPP	x	Joe Stanisz	Iowa DOT	x
Bill Oliva (<i>Chair</i>)	Wisconsin DOT	x	Don Whisler	Kansas DOT	x
Sarah Sondag (<i>Vice Chair</i>)	Minnesota DOT	x	John Culbertson	Kansas DOT	x
James Leaden (<i>Secretary</i>)	Kansas DOT	x	Paul Kulseth	Kansas DOT	
Jeremy Hunter (<i>Past Chair</i>)	Indiana DOT	x	Jason DeRuyver	Michigan DOT	x
Sarah Wilson (<i>Director</i>)	Illinois DOT	x	Paul Pilarski	Minnesota DOT	x
Josh Rogers (<i>Director</i>)	Kentucky TC	x	Kent Miller	Nebraska DOT	x
Glenn Washer (<i>Director</i>)	U of Missouri	x	Mark Traynowicz	Nebraska DOT	
Patrick Conner (<i>Director</i>)	Indiana LTAP	x	Nancy Huether	North Dakota DOT	
Nick Graziani (<i>Director</i>)	Watson Bowman	x	Barry Kinnischtzke	North Dakota DOT	
Tom Donnelly (<i>Vice Chair Non-State Agency</i>)	Transpo		Mike Brokaw	Ohio DOT	
John Bunderson (<i>Social Media WG</i>)	Metal Fatigue Solutions		Walt Peters	Oklahoma DOT	x
Scott Stotlemeyer (<i>Systematic Preventive Maintenance WG</i>)	FHWA	x	Todd Thompson	South Dakota DOT	
Brandon Boatman (<i>Preservation Matrix WG</i>)	Michigan DOT		David Coley	South Dakota DOT	x
Fouad Jaber (<i>Deterioration Modeling WG</i>)	Nebraska DOT		Richard Marz	Wisconsin DOT	x
Tim Anderson (<i>Director</i>)	FHWA		Tim Woolery	Adv. Chem. Tech. Inc.	
Larry O'Donnell	FHWA		Lorella Angelini	Angelini Consulting	
Raj Ailaney	FHWA	x	Pat Martens	Bridge Preservation and Inspection Svcs.	
Dick Dunne	GPI		Jason Fogg	HDR Inc.	x
			David Heilman	JET Filter System LLC	
			Greg Heilman	JET Filter System LLC	
			Paul Jensen	Jensen Engr & Cnslt	x
			Dave Juntunen	Kercher Group	
			Drew Storey	Kercher Group	
			Kyle Bartfay	Phoscrete Concretes	
			Jacob Armour		x
			Karl Hartline		x
			Mike Todsén		x



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- **Roll Call** – Kent Miler phoned-in, all others were on the teleconference.
- **Approval of Minutes – January 7th, 2020 Monthly Meeting**
 - Change the Header for the 2020 MWBPP Annual Meeting to reflect the correct dates and location of September 9th thru 11th in Lexington Kentucky.
 - Add a note stating that Paul Pilarski’s Presentation “MnDOT long term study on the use of FRP’s, Shotcrete, Chloride Extraction, Silane, and other products on substructure elements – different approaches of old substructure repairs and follow-up 20 years later” will be posted to the TSP2 website.

Changes were made and sent to Darlene Lane immediately following this month’s teleconference. Once changes to the minutes were noted, Bill Oliva made a motion to approve the Meeting Minutes from the January 7th, 2020 monthly teleconference. Sarah Wilson Seconded the motion. The motion passed.

- **2020 MWBPP Annual Meeting (Lexington Kentucky) – September 9thnd – 11th 2020**
 - *Josh Rogers and John Hooks -*
 - *Call for Presentations (John)*

John Hooks stated that he has updated the agenda for the Annual Meeting. The Survey Monkey is “out on the street”, and he’s had 6 responses so far. He encouraged that it be distributed widely, and that anyone can respond with an idea for a presentation. John also mentioned that the next planning committee call is scheduled for February 19th, 2020. Josh Rogers added that he had problems making the hot-link to this survey. Darlene Lane re-sent an updated version.

- **MWBPP Deterioration Modeling Working Group (Bill Oliva)**
 - *Request for information (RFI) for the project*
 - *Need to have response from participating states*

Bill started out talking about updates: They are trying to schedule a conference call with the 12 States involved concerning the information collection process. They are looking for a date in the next couple of weeks to establish a recurring monthly call with the 12 states in the working group. Bill will continue to look into this. Bill stated that we need to encourage the States to move forward with collecting this information and submitting it. Overall, we’re in good shape. The schedule is perhaps slipping a little bit, but that’s OK because the information collection is the most complex part of it. If you’re a State Rep who is also on the Technical Oversight Committee, Bill encourages you to provide the information. It’s not an all or nothing deal, there are a lot of elements to be populated (e.g., NBI Information, Element Information, Policy Documents, Inspection Manuals, etc.). You can start inputting things in components and build to what’s needed. And some States may not have all the components. Whatever you can do, as soon as you can do it will be helpful.

Kent Miller asked how successful they were at getting data from all the States? Bill responded that 3 to 4 States have submitted data, and it sounded like more are moving in that direction. Bill will try to touch base with Jonathan to get an update and set up a conference call with the oversight committee to talk through some of the challenges. Kent also mentioned that entering information was a piece of cake except for entering construction data which was a bit messy.

- **Monthly Preservation Topic:**

- **Glenn Washer**, – *University of Missouri. Non-destructive testing on bridges, what are the options, what to use, and when. Glenn will give an overview of some of the more frequently used technologies and provide insight and commentary to what they are best used for, and when perhaps these technologies may not be helpful.*

Glenn’s Presentation mainly covered Ground Penetrating Radar (GPR) and Infrared (IR) non-destructive testing (NDT) techniques. Acoustic NDT techniques may have to wait for another time.

Two things to consider when deciding which technology to use is whether traffic control will be used, and the “Speed and Accuracy”. SATO = speed accuracy trade-off. It’s hard to be fast and good in most cases. So, you trade speed for accuracy. Another factor affecting these technologies is whether or not the deck has an overlay. If it does have an overlay, the thickness of the overlay is also a factor. If you are interested in debonding of the overlay, or delaminations (delams) in the deck, or conditions of the deck overall, or if you want to identify areas for a repair, or if you want an assessment of a group of bridges to prioritize later on, these things are what you need to consider when deciding which technology to use. This can determine if you need something that is not as accurate, but is fast, or if you need something that is not as fast, but is accurate.

Issue #1, not all delams are created equal. It could be caused by corrosion. Though not all corrosion causes delams. It may result in cracks in the deck. Not all damage is in the form of a delam. If the delam is not caused by corrosion, other causes might be from debonding of the overlay, or a delam under the overlay, or a shallow delam. Typically, if the delam is caused by corrosion, it will be thicker. If it is **not** caused by corrosion, it will be thinner. One thing about IR is that the depth and the thickness of the delam has a big effect on the result. IR will show thinner delams really well, thicker delams will be a bit more difficult to spot. A thicker delam creates a lot more thermal contrast than a thinner one.

One thing you might want to think about first is what are your goals of the assessment. Do you want a quantity of Square Feet (SF) of damage, or do you want a quantity of SF of deterioration? Some systems of IR may show cracks and patches in the deck that can be quantified as deterioration. But GPR may not show the surface deterioration but will show the underlying damage.

Glen showed a video outlining the differences of a dry and wet delamination.

Glen also dug into details that involved dielectric constants, electro-magnetic fields, polarizing, velocities, speed of light, measurements on decibel scales, wave lengths, etc. *I could not capture these details with sufficient accuracy, so it would be best to contact Glenn Washer directly rather than relying on these teleconference notes if you want detailed information on the discussion Glen presented on these items.*

For GPR, the data that’s analyzed is the top 2” to 4” of concrete down to where the reinforcing bars are located. Results will depend on whether the concrete is dry, moist or wet.

Stuff to know about GPR: what affects the reflection:

- *Affected by the moisture in the concrete.
- *Salt increases the conductivity and affects the signal when in solution (i.e., combined with moisture).
- *conductors reflect the wave entirely.
- *Aggregates may have more or less conductive properties.
- *Higher frequencies mean less penetration depth
- *Lower frequencies mean more penetration depth.
- *Ground Coupled vs. Air Coupled:
 - Ground Coupled – antenna rests on surface (needs traffic control)
 - Air Coupled – 1-3 horn system over the lane (at traffic speeds)
- *Output shows where the rebar is, measures amplitude and can be gridded out on a layout of the deck to show the flaws.

Delams sometimes occur in the areas where the corrosion environment exists. Sometimes they haven't occurred yet. People use this type of technology to make a long-term projection. Air coupled you do a lot of areas of deck at a lower cost and prioritize them. If you want to determine where you want to patch a deck, then this wouldn't be a good approach because it's not detecting delams directly.

The presentation was going long. Glenn asked if he had more time. Bill O. clarified- "what we are looking for among the different technologies are: 'these are their strengths', and 'this is why I would use one versus the other'". Glenn then continued detailing the benefits of Infrared (IR) technology.

For IR, you take into account the thermal anomalies in the deck. Defects are hotter in the day, and colder at night. A couple styles of IR technologies are handheld cameras and vehicle mounted bolometers (thermometers) (these are the most common). Resistance changes with the temperature in the little tiny sensor in the array. They are most cost effective, but they have a time constant (they don't detect immediately, there is a delay). There is a time-lapse method that Glenn didn't have time to cover in this presentation.

For IR to be effective, it all depends on the weather conditions. Also, a 1" deep defect creates a lot of thermal contrast, and a 3" deep defect creates a much smaller thermal contrast. Its best suited for relatively shallow concrete defects (less than 3" deep).

IR Camera specs that are used, and inspection conditions:

- *7-10 microns (most common)
- *Array Resolution 640 x 480
- *Thermal Sensitivity K (Kelvin) < .5
- *Thermal Accuracy – don't care really.
- *Lenses – wide angle telescopic normal.
- *Bit Resolution – 14- or 16-bit system - how they digitize the voltage range of the system (14 bit – 16,000 points, 16 bit – 65,000 points) 16 bit has better resolution.
- *Video or stitch together frames.
- *Conventional IR you might use – handheld cameras vs. vehicle mounted.
- *What weather are you going to work in.
- *What time of day are you collecting the data.

GPR can be done at traffic speeds. Some IR can be done at traffic speeds. Impact echo cannot be done at traffic speeds.

The overlays affect the quality and results. You need to know what you're working with. Acoustic methods aren't going to work very well with asphaltic overlays. They work well for detecting debonding. IR can work if the overlay is not too thick. GPR can penetrate overlays to find the condition of deterioration of the concrete.

That's about all the information Glenn could provide in this teleconference call, given the time allocated.

Glenn also wanted to announce that academic directors are asking for research ideas for anything related to preservation in the next month to get a bunch of ideas throughout the 4 partnerships and pare it down to submit later.

Bill thanked Glenn for the presentation, knowing that there was much more information that could've been provided, and asked if people had questions, could they contact him directly. Glenn said that would be no problem. Glenn said he would provide a copy of his presentation for this month's teleconference notes.

- **Monthly Preservation Conversations**

- *Update on the ETG (Expert Task Group) Working Group (Jason DeRuyver)*

Jason started out noting that the ETG Working Group (WG) has monthly teleconference calls. The last face-to-face meeting was held in November 2019 at Denver, Colorado. This is the 4th year of the ETG. The ETG WG had wrapped up the Strategic Objectives and deliverables from the previous 4 years, so it was time to come up with new Strategic Objectives and Deliverables. These are the new drafts of the Strategic Objectives moving forward. Jason gave us a preview of these at our 2019 MWBPP Annual Meeting in Bismarck, ND. The new **draft** Strategic Objectives and deliverables are as follows:

Strategic Objective #1 is to provide guidance on cost-effective bridge preservation strategies”. A lot of action items: develop technical guides, develop case studies, determine duration of bridge preservation treatments for performance models, develop guidance on how bridge preservation actions influence NBI bridge condition ratings and performance curves, identify data attributes each bridge owner should collect to bring consistency and usability of the data such that the effectiveness of bridge preservation can be demonstrated.

Deliverables include: Case Study, Pocket Guides, Research, videos, web-based portals, webinar, implementation study.

Basak Aldemir – Bektas did a lot of research on everyone’s data collection across the country on bridge inspection, and she said it’s really difficult to do any analysis because not all data is consistent. She’s going to identify things we all should be collecting to make the data more useful.

Strategic Objective #2 is to Promote Bridge Preservation as a component of asset and performance management. Promote more collaboration. There is an Assess Management Expert Task group to make sure our goals are aligned with other task groups to integrate things together. Dave Juntunen will be working benefit cost analyses for bridge preservation activities.

Strategic Objective #3 is to Advise and assist in developing and deploying bridge preservation education materials – getting the word out, advance the relationships between the ETGs, the TSP2s, and the AASHTO TC3 that we partnered with to get the pocket guides turned into micro online classes. We’re also going to identify standalone lessons learned webinars. Research into webinars – John Hooks.

Strategic Objective #4 foster a collaborative environment that encourages innovation and adoption of new technologies for bridge preservation. Create a web-based clearinghouse to coordinate all the bridge preservation research ideas. Identifying ways that the ETG can facilitate the adoption of research or the dissemination of the information nationwide. John Hooks is also developing priorities for all 4 regional partnerships for their research. Also looking at exploring an opportunity to have more regional qualified products lists.

Raj Ailaney stated that another project we are working on with the Iowa DOT developing a web-based deck preservation portal. It should be out this month, or next month. They will have a national webinar for all 4 partnerships can learn about this project. The webinar will be on March 19th, 2020 between 12:00 and 2:30 eastern time. They are working on a flyer that will be sent out announcing this.

- **Other New Business**

- *Monthly Preservation Topics for March – volunteers*

Bill noted that Jeremy Hunter attended the 2020 TRB Meeting. There isn't time to present that in this month's meeting. His presentation will be deferred to the March monthly teleconference call.

One other topic, the national proposed rulemaking with regards to the NBIS code of federal regulations deadline line has been pushed back to March 13th, 2020. There is good communication going on highlighting the good stuff and flushing out concerns.

- **Next Monthly Meeting**

- **March 3rd, 2020**

Jeremy Hunter 2020 TRB Meeting highlights.

If there is a topic you would like to see on one of our monthly calls, contact Bill Oliva.

- **Meeting Adjourned**

Bill Oliva thanked Glenn Washer, and Jason DeRuyver for presenting on this call.

Bill proceeded to end this meeting on time at 2:00 PM in the Central Time Zone.