

Session 3 Report Out:

Indentification of Need for Preservation

MWBPP Conference
Council Bluffs, Iowa
October 16-18 2012

Discussion Highlights (note main discussion items)

Q 1.

- **Nebraska has a federally approved bridge preservation program – based on a condition. Starting to implement cyclical**
- **Michigan has a bridge preservation matrix (one for black rebar & one for epoxy-coated rebar) for both top and bottom surfaces – the tool is available on line. ‘Time to pour’ tool to identify bridges for future needs.**
- **(Chicago Metro Area) Illinois – Deck sealing for 6 or better; conditioned based. Funding set aside for preservation.**
- **Buchanan County / Iowa – Committee review**

Q 2

- **Effectiveness is based on the condition stays ‘better longer’**

Q3

- **Industry assistance is critical to be able communicate ‘best practices’ – whether from industry associations and/or vendor representatives**

Q4

- **Funding, Funding, Funding...**
- **Asset management software tools**
- **Michigan as an Asset Manageable Council – develops a preventative asset management guide for bridges for local agencies**

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- **Sealing, thin-polymer overlays, bridge washing**

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

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Discussion Highlights (note main discussion items)

- Leading Question No. 1 – Tools are not readily available or are being developed. Agency staffs responsible for appropriating preservation funds to projects are not necessarily in contact with those with information about existing conditions of structures. The lack of communication creates subjective criteria for the selection of projects and various methods to determine the best methods to select projects or identify structures. The criteria or method utilized are worst first.
- Leading Question No. 2 – Visual Inspection is used as the primary means to determine the effectiveness Bridge Preservation Actions. Monitoring the change in the NBI Condition Ratings over time can help as an additional tool but may or may not be widely used for evaluating the effectiveness of preservation actions. Since the application of preservation actions will have to be tracked in conjunction with monitoring the deterioration of the NBI Condition Rating, agencies have not developed tools or means to record and document both data sets for numerical or graphical comparisons.
- Leading Question No. 3 – State agencies do partner with industry to develop projects. Local agencies have partnered on a small number of projects but not on a regular basis.

Industry can help but generally speaking the state or local agency must engage the industry to get help. So without contacts or exposure at event like the MWBPP the ability to leverage the knowledge or experience from industry for identification of appropriate preservation activities for the appropriate project.

- Leading Question No. 4 – Did not discuss
- Leading Question No. 5 – Agencies have strategies that are reactive measures (e.g. repair or rehabilitation of timber piles) but do not have enough information, collect enough information or made an attempt to codify a proactive measures or preservation plan for timber piles. For other piles a similar reactive approach is used for most pile types. Steel and concrete piles can be coated but other than these options, which are not commonly exercised by all agencies or consistently by any single agency, not many preservation activities are known or used for substructure components.
- Leading Question No. 6 – Some agencies do not even monitor the levels of chlorides so they do not distinguish between high chlorides and corrosion. These agencies have a reactive approach so only when concrete spalls or delaminates would an evaluation be made to determine cause of delamination or spall for further action.

For agencies that do monitor chloride levels, chloride levels and material conditions are both used prior to taking action. The reasoning behind this is that high chloride levels do not necessarily correspond to material with corrosion.

- Leading Question No. 7 – Funds are available for a limited number of preservation activities to be used statewide but no agency has funds for an entire preservation program that would utilize a complete array of preservation activities.

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Need to collect data on the types of preservation activities in use, discontinued with comments on the performance. Performance measures or evaluating the effectiveness of preservation activities is a large task that no baseline has been established. States and other agencies have developed individual performance measures for evaluating preservation activities for improvement or to discontinue the use of a particular preservation activity.
- MWBPP need to market more to local agencies directly and not necessarily solely rely on state agency to make contact. Local agencies indicated that attendance at MWBPP was not because of some piece of mail or email sent to the local agency, TTAP/LTAP, etc... but rather through happenstance during discussions with industry, states, etc...

Group number: 3

Discussion topic:

Discussion Highlights (note main discussion items)

- **Item 1: inspectors generate list of needs, District needs requests; Bridge Management Section generate the need list**
- **Item 2: By inspection, condition ratings**
- **Item 3: USE TSP2 website to promote product success as preservation tools**
- **Item 4: Deterioration Models and set of performance measures**
- **Item 5: timber pile repairs, do preserve timber and steel piles**
- **Item 6: No action, threshold used for Rigid Overlay placements**
- **Item 7: states agencies have dedicated funds for bridge preservation, counties mixed with other priorities.**
- **Item 8:**

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- **Different preservation Methods**
- **Funding for preservations**

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- **Use of ACC with membrane to preserve Decks that are in good condition**

Discussion Highlights (note main discussion items)

- **Tools:**
 1. **Minnesota - BRIM (Baker), Low-Medium-High Maintenance Actions Identified**
 2. **Indiana - DTM, Condition based, risk based, Priority Number. Districts report when work is complete**
 3. **Michigan - MyBridge, collect all bridge data (NBI and Element), forecast deterioration model to program timely PM activities, Use Pontis to look at costs**
 4. **Mineha County, SD - No System Yet**
 5. **Nebraska - Spreadsheet**

- **How do you determine effectiveness:**
 1. **Michigan - Track Deterioration Model with NBI data**

- **Do you distinguish between high chlorides:**
 1. **Michigan - No**
 2. **Nebraska - Yes, Threshold is 2.0 lbs/CY**

- **Does your State Have dedicated preservation funds:**
 1. **Indiana - use to generate candidate list using BCPI - send**
 2. **Michigan - 22% of budget spent PM**
 3. **Minnesota - HSOP Funding, Districts use their own budgets**

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

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Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- **Provide a Standard Definition for Measurement of Chlorides (e.g., Lbs/CY)**
- **Provide a Threshold for Chloride related actions**

Discussion Highlights (note main discussion items)

- **TOOLS TO ID PRESERVATION NEEDS:**
- Heavy reliance on bridge inspections, experienced inspectors and bridge workers.
- Combination of cyclical and condition-based. Cyclical activities: list of PM activities and appropriate frequencies.
- SIMS: condition assessment feeds into a needs list, in some cases Districts prioritize in some cases Central Office prioritizes.
- Combination of systems and human element.
- Pontis deterioration model used to suggest bridges and work types.

- **EFFECTIVENESS OF PRESERVATION ACTIONS:**
- Based on experience/judgement/instinct, past practices and research.
- Nobody in our group has a systematic method to gauge effectiveness, or solid numerical information.
- Coming together in a regional group to validate our practices against our regional peers.

- **DOES INDUSTRY HELP YOU IN CHOICES OF WHAT IS AVAILABLE:**
- Generally, yes for the DOT's, but not as much for local agencies.
- DOT's normally have a greater capacity to review/test/approve products and materials.
- Local Agencies often look to the State DOT to establish standard specifications, approved product lists, etc.
- We've had good luck with industry participating in research, sponsoring research, helping us deliver pilot projects and demonstration projects. They are good about providing references.

- **WHAT MANAGEMENT TOOLS WOULD HELP IN DETERMINATION OF NEED.**
- We need tools (such as Pontis 5.2) to forecast bridge conditions and evaluate effectiveness of bridge Preservation Program. This will help us communicate with public, legislators, and agency decision-makers.
- Eventually those states that are running multiple systems would like to see a single system to manage Condition Assessment and Preservation (and Improvement?)

- **STRATEGY TO PRESERVE/REPAIR TIMBER PILES?**
- Some states have very few (no) timber pile bent bridges on their State system.
- Pile preservation strategy is needed for Local Agency bridges.
- Generally managed by waiting for major repair need and fixing.

- **USE HIGH CHLORIDES OR USE CONDITION ASSESSMENT TO DETERMINE DECK REPLACEMENT NEED**
- We have found some bridges with high chloride levels, yet the bridge does not have significant corrosion, delamination, etc.
- Most states use deck condition (chain drag, GPR, IR) to determine deck preservation needs (overlay, repair, replacement).
- Major bridges, substructures sometimes use chloride content to drive action (chloride extraction, repairs)

- **DOES YOUR STATE HAVE "TRUE DEDICATED FUNDS" FOR BRIDGE PRESERVATION**
- Yes for most DOT's.
- MnDOT has District operation budget that supports bridge preservation activities. We also have a HSOP that supports bridge preservation.
- Local Agencies: focus has traditionally been on "worst first" bridge management.
- Expect that MAP21 will bring some changes.

Discussion Highlights (note main discussion items)

- **Preservation plans for deck sealing on a cyclical basis. Cycles are determined by looking at past condition ratings.**
- **Pontis elements are used in some cases to help identify projects.**
- **Iowa discusses the bridge needs with each District once a year. The needs are prioritized and funding determined.**
- **Effectiveness of maintenance is difficult to track and has not been a priority.**
- **Quality inspection and vender participation is an issue on small projects.**
- **Performance based specifications that are generic enough to allow multiple products to meet our requirements for letting could be provided by vendors since we don't always have the knowledge to write a good specification.**
- **Management tools are only as good as the data that is collected. Data collection is an issue that has to be overcome before a management system can be relied upon.**
- **With limited staff, a management system is almost impossible to maintain.**
- **Outsourcing inspections could be a way to help identify needs.**
- **Chloride detection on a regular basis is not a typical practice in this group.**
- **Oklahoma and Iowa have dedicated funds for preservation.**

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- **Oklahoma has been repairing piles under bridge abutments. Pile have corroded due to exposure to water under the abutment.**
- **Missouri has spliced timber pile.**
- **Iowa is developing a strategy for protecting steel pile under abutments at construction by galvanizing, painting, or coating the top of the pile after it is driven.**
- **Oklahoma has begun encasing the top four feet of pile under abutments to prevent exposure of the pile.**

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

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Group number: 7

Discussion topic: Identification of Need for Preservation

Discussion Highlights (note main discussion items)

- **Effectiveness of bridge preservation actions are more based on what doesn't work (failures in the short term) than what does perform in the long term (not enough time to evaluate their effectiveness as preservation activities are relatively new).**
- **Industry does make State DOT's aware of individual products on a company by company basis**
- **Reliable deterioration models would help determine need and effectiveness of preservation activities**
- **Bridge preservation funds are more maintenance funds, some of which actives are preservation**

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- **Projected deterioration rates of decks, super and substructures based on existing NBI data**
- **Timber and steel pile repair is typically accomplished through concrete encasement**
- **No immediate action is taken based simply on chloride content measures**

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- **Deck deterioration models**

Group number: 9

Discussion topic: Identification of Preservation Need

Discussion Highlights (note main discussion items)

- **Q1: Mostly inspection recommendations. Would like to use a tool like PONTIS but have not found it to be reliable or easy to use up to now. Some in-house developed spreadsheets and applications in Kansas and Nebraska to try to predict preservation needs (for funding purposes).**
- **Q2: Up to now, it is mostly anecdotal. Now that we are starting to collect more data (Condition, Maintenance Actions, etc) we should be able to develop performance criteria.**
- **Q3: Generic is a confusing term in this question. In general industry needs to make sure to promote their products but not oversell them. Also need to have some way to evaluate products/materials on a long term basis.**
- **Q4: Pontis or some similar tool for management system...systematic as well as user friendly. Also need to clarify the purpose of predictive models. Most states will use them for predicting funding and life-cycle cost analysis, but not necessarily for triggers for maintenance actions.**
- **Q5: Replacement when condition warrants rather than repair/rehab. Nebraska is looking at using FRP sleeves around timber pile as a retrofit technique on a smaller bridge.**
- **Q6: Only determine chloride content for scoping purposes. We don't find chloride content on a routine basis, so it is not a metric for determining immediate action. It just helps us determine what type of action is going to be done when we are ready to do something.**
- **Q7: NE – no; IA – no; KS – yes**

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

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Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- **Q3: It may be useful (maybe not practical though) to have a central site where states can compare experiences with products/materials....good as well as bad. (Use this product, don't use this product, discontinued use of this product)**
- **Q1 & Q4: More recognition for the Long Term Bridge Program.**

Discussion Highlights (note main discussion items)

- **Topic 1: Bridge inspection reports and inspector work order recommendations. NE has in-house software that flags work candidates based on condition.**
- **Topic 2: Experience from doing it before and inspection reports. NE considered the PM actions In the FHWA Bridge Preservation Guide to be cost effective, but is attempting to track costs and effectiveness of PM actions.**
- **Topic 3: We all routinely consider the input of product and services representatives. NE has used modified versions of material specifications from product purveyors.**
- **Topic 4: Ne seeks improved material testing response time. SD uses Pontis Element Level data to generate a deterioration model to suggest timing of work.**
- **Topic 5: NE has a timber pile repair detail available on request for a fabricated steel device that induces load on remaining section of timber pile but it is expensive. KY and NE do concrete encasement of timber pile. NE does concrete encasement of steel pile.**
- **Topic 6: Is this question asking if we distinguish between high chlorides and high corrosion rate? NE and SD test for CL to inform decision to place a SFO with threshold of 2.0 LB/CY.**
- **Topic 7: SD, KY say no, NE also says no, but has made up to 50% of 2016 – 2021 bridge funding available for preservation activities.**

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

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Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- **KY suggests encouraging use of ACC and membrane on initial construction.**

Group number: 12

Discussion topic: Preventative Maintenance

Discussion Highlights (note main discussion items)

- 1. Tools used Include regular safety inspection, in some cases using element level inspection results to identify specific items to address. Also during other maintenance activities as needs are identified. In addition, some level of cyclical preventative maintenance**
- 1. States seem to track the condition of the components on an annual basis, however, it is not tied back to the actual activities taken in the past.**
- 1. We feel industry has stepped up to the plate to offer options for Owner's needs. Owners may be more receptive to new technologies and innovations that Industry may propose.**
- 1. A more defined and institutionalized preservation policy. Also, more research related to the cost and timeframes for preservation activities. A management information tool that helps collect and analyzes data.**
- 1. Timber piles could be encased in pipe culvert with concrete filler. Also use of spliced in H-pile with encasement.**

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- How do toll authorities handle bridge preservation. From the perspective maximizing profits over and extended period of time, how does a Toll Authority handle life cycle investment and return in their facilities.**

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Need**
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