

2022 MWBPP Inspection and Evaluation Peer Exchange Notes

Moderator: Mike Brokaw ODOT; Notes: Luke Adkins KYTC

- Major problem is staffing. State agencies have trouble competing with private sector as far as salary. Especially challenging to retain engineers.
- Colleges are also seeing decreasing enrollment in civil engineering. Employers offering scholarships and/or internships could help remedy this.
- Consultants becoming much more widely used due to staff shortages. Inspectors need to be pulled out of their Districts in order to be able to keep up with inspections.
- FHWA requirements of 5 years' experience for technicians makes it hard to get people qualified. It would be nice if the 5 years could be expedited by documenting repetitions or a test.

Asset Management Peer Exchange

5.2

Josh Rogers- KYTC Moderator

Dave Junter- formally Michigan

B&N

Sudhir- KTC

Resynses

Sarah Wilson-IDOT

Phil Litchfield- IDOT

Blake- HydroTechnologies

Sixsence

Mark- KYTC

Waltner- Oklahoma

James Edmunds- KYTC

Palmer

KY Uses AASHTOWare BRM for inspection and asset management. Been working fairly well. Started optimization about 1 year. Started out with Pontis, turned into BrM- about 10 years ago. Got to the top of the pyramid last year- optimization. Last year budget plan year- used BrM optimization in parallel with the 2 year plan biennium. Have group of projects submitted to the SYP, and leadership helped out and got several of those bridge projects into the final plan. Oklahoma also uses BRM for inspection and bridge management. Asset manager turns out the reports fairly frequently, to look at good/fair/poor- spreadsheets for in-house use. Not the most user friendly. Talked to other companies.

IDOT- BrM, Detemps? Uses an in house program for inspection. Asset management has been an inhouse program. Hopefully Brm will be more usable, haven't released to the districts yet.

Sarah Wilson- how did the flood impact the funding situation, etc.? Josh- all resources going to EKY. Leadership decided to fund all this- using maintenance budget. Still trying to get our state funded projects out in parallel. Still slowly doing both parallel. Balancing needs of maintenance vs emergency. Priority index from 0 to 1, for both emergency bridges and SYP bridges. That prioritization did justify the need to spend the money in EKY. TAMP isn't helped with the county bridge replacement in EKY.

Oklahoma- field districts set the program, and CO provides lists to help figure out what they want to work on. Expansion joints only in BrM, so have to separate them out- fixed joints, strip seals, pourable silicone- seems to do better for expansion than fixed- not getting a lot of life in them. Will foam or inverted v's work better? Aluminum joint that has fingers, modular type- innovative type of stuff that no

one knows how they are doing. Turnover etc. IS Oklahoma more decentralized? Construction program is in the field- Most decisions made in the field, so yes, mostly decentralized. A lot of politics.

KYTC- optimization, etc. done out of CO. Mentality thing to get the inspectors to code things a certain way, etc. Added types of wearing surfaces in the inspection code. Has helped with the asset management and optimization. All starts with the inspector in the field. Deteriorating with the element level- get more detailed with the inspection information- better results with element level inspections. If off a little with the element inspection- will mess up the optimization.

Prioritization? Calculation derived for the priority index. When inspection data gets updated, the priority index gets updated. Priority index developed last year. BrM can be set up however you want for the optimization program. Sensitivity index? Mobility, etc. what results do you get with changing weights around? KYTC primarily runs from condition, as a check, then tuned in other stuff- adding other utility values- which had some change, etc. Condition should pretty much control, and the others be tie breakers. Most people weigh it towards condition.

Illinois mostly decentralized, not much help from CO. Historically, \$ divided based on percentages, with most going to Chicago, and rest of districts not getting as much. Pot of money set aside for TAMP- fight with Pavement side to make sure bridges get money. Uses spreadsheets. Have had for 25 years a wearing surface code- and can look at cyclical maintenance. Compare age and then use NBI items and joint condition to prioritize repairs. If do joints, might as well overlay it.

TAMP numbers showing that our good is going to fair. With mostly percentages going to Fair. New optimization trying to maintain the fair. Big slug of 50-year-old bridges in KY that'll be a problem eventually.

Also same with Chicago, section of interstate bridges that are 40 years old. Big projects- take care of with band aids. Apply for mega grants.

KY- complex structures/border bridges/ separated them out of the "pot"- and just try to do something with every year. We have most of the leadership and management of the Ohio river bridges, and other states agreeing and reimbursing us for 50% of the costs. Illinois- program for bridges over 1000 ft long- includes most of the border bridges- try to get the big bridges sealed and joints. Separate pot of money means they get more attention.

Optimization in KY, separate state maintenance fund- deals with preservation funds- separate model run, excluding the SYP bridges. Prioritized preservation vs replacement.

Whats a complex bridge in KY- steel truss, cable stayed, etc. Illinois hasn't declared all their steel trusses as complex truss. No moveable in Ky.

KY, bridge washing- what type of number would you give it in the optimization? Washes the chlorines off. Study done to see how long the preservation activity prolongs the life of the bridge? Also sealing bridges. Judgement call by engineers to say how what that value is. Painting best one to capture- look at element level and inspection.

Illinois doesn't have enough to paint all their bridges. Initially has 4 million- which would paint the bridges every 100-120 years... increased it to 8 million. All the information is good to show what amount of money you should spend on preserving, etc. your bridges.

Illinois paints beam ends and fascia. Michigan also same.



Deck and Joint Preservation Discussions Summary Wednesday, October 26, 2022

Session 1 Moderator – Pat Martens (22 attendees)

Session 2 Moderator – Sarah Sondag (24 attendees)

Notes – Nick Graziani

Best practices and challenges for decks and joints?

- (IL) Cyclical maintenance works well and offers simplicity, as an example;
 - Year 12 – address joints
 - Year 25 – overlay and joints
 - Year 37 – address joints
 - Year 50 – new deckUtilizing silanes early on new decks as a protective coat. More judicious use of pretreatment.
- (NC) Working towards establishing a cyclical maintenance program.
- (OK) Silanes and sealers are working well. Also found that cleanings extend longevity.
- (KS) Not using silanes. Have historically used thin polymer overlays but may have pushed their limits with regards to application over unsound concrete.
- (WI) Typically applying 2 silanes treatments on new decks and at regular intervals of 3 to 5 years. Also utilizing thin polymer overlays.
- (IN) Silanes at years 1 and 5 and then moving to a thin polymer overlay.
- (MI) Will apply silane and healer/sealer in same mobilization.
- (NE) Utilizing waterproofing membrane under asphalt overlays. MMA healer/sealer applications included in contracts for early cracking.
- (MN) Trying to stay cyclical versus reactive. Bridge flushing every spring and sometimes again in fall. Challenge is the time required and that they can gather debris again shortly after. Deck and joint maintenance every 5 years depending on inspection reports. Fibers appear to slow/arrest early cracking on steel bridges.
- (TX) See a need for more routine cleaning. No existing cyclical plan in place but routinely addressing joint seal maintenance.
- Most states favor strip seals for small movement joints.
- Pourable silicone “doesn’t last long but is easy to maintain”.
- Foam joint seals for short spans / integral abutments. Some states using foam seals to replace neoprene gland in strip seals when lug cavity is too corroded from chlorides to replace gland in kind.
- (KS) Recommendation to always have manufacturer on site for installation/application.

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- (WI & MN) Utilize plow fingers. Question was raised about the range of skew angles that would be best suited for utilizing plow fingers?
 - Some states repairing or replacing strip seal glands as needed with maintenance personnel.
 - (NE) Using foam seals above strip seals in barriers.
 - Recommendation made to use a thin polymer overlay right away followed by MMA flood coat every 5 years after for segmental bridges.

Triggers that drive maintenance/preservation?

- (IL & NE) Condition based but also maintaining an awareness of other bridges in the associated corridor. Recommendation to start/maintain a candidate list and “priority preservation” list for signature bridges.

Potential research needs?

- Use of UHPC for headers?
 - (KS) has tried and appears to be performing well but question was raised regarding high cost.
- Factors affecting early cracking in low slump overlays? Perhaps installation practices.
- How to evaluate deck condition under asphalt overlays?
 - Suggestion to start with deck analysis under HMA patching.
- Assessing the effective life span of materials?

Industry questions and general comments?

- How do manufacturers bring innovative products to the DOT’s when they don’t fit into existing APL/QPL?
 - Generally difficult to get new products through innovation/experimental funding.
 - NTPEP can be useful for material validation but not necessarily for the application or intended use. It is also expensive for each item tested.
 - ITD <https://tsp2bridge.pavementpreservation.org/industry/itd/>
 - Recommendation to start at district level for demonstrations and evaluations. If found favorable, they can advocate to materials or bridge office.
- CEU Reminder https://www.tsp2.org/register/input.php?meeting_id=229
- Thanked sponsors, attendees, vendors and adjourned.

MWBPP Minutes for substructure Break out

Q: How are Bridge maintenance crews Structured?

- A: MIDOT: all regions have a dedicated and one statewide crew that deals with steel
- OKDOT: 9 maintenance crews for the stat
- NDDOT: 4 regions with 1 crew each
- KYTC: 12 Districts each with a maintenance crew

What types of maintenance is performed by state crews?

- Cleaning decks and drains
- Pothole patching
- Carbon fiber wrapping
- Joint replacements
- Stream stabilization
- MSE wall maintenance
- Bent and Pier cap strengthening
- Thin epoxy overlays on substructure units

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Superstructure and Bearings

Session 5.1

Jason

Aaron Porter- Michigan DOT,

Brian – Intech

Benjamin- Clark Deitz

Jason- Collins Engineers

Chris- MNDOT

MNDOT

Joe- Iowa DOT

Mike- Michigan DOT

Matt- North Dakota

Ryan-FHWA

Nebraska

Joe – AECOM

Barrit-Collins

Anthony-Wisconsin DOT

For State Maintenance Crews- do you have one? Michigan- yes, anything from deck patching, sealing, etc. Local also have garages. MnDOT- 3 bridges crews in one district- anything they need to do- overlays, patching, joints, greasing, IOWA- each bridge crew with 3 people- overlays, patching, joint work. Nebraska- 8 districts, at least one with a bridge crew, none of the others. Wisconsin- counties do minor things, bridge crew helps mostly with inspection. N Dakota- not specific to bridge, do sealing, work in progress. Management shut down a district who wanted one.

DO they have bearing maintenance activities? Michigan- just deck washing, bearing greasing, region crews mostly cleaning. Never really thought about bearing maintenance. MNDOT- not really a schedule, they get to it when they can. They do wash their bridges every year. Iowa- sliding plates- crew do those and reset those. Nebraska- have to contract bearing rehab out to contractor. Wisconsin- rare to do bearing rehab- try to clean as best we can. N Dakota- lucky to get them cleaned.

Superstructure- what kind of maintenance activities with state crews or contract forces. Michigan- don't traditional seal PCIBS, occasionally crack inject them. MNDOT- PCIBS beam ends get sealed/coated before leaving manufacture. Maintenance crews have also crack injected them. No ASR problems. Still shotcrete PCIB beam ends. Encased beam end. Iowa similar to MNDOT- ends coated with sealer at the plant. Crews do crack injection of minor beam hits, also do FRP wrap to contain the ends. Part of

MNDOT in the spec book to coat the beam ends. Probably also Iowa. Nebraska- deteriorated beams over joints- pour a full depth joint- to keep the expansion potential,

N Dakota- building integral like that.

Iowa- take out expansion joints, and do similar, to make it integral for a repair project.

MNDOT- metalized beam ends. Give the contractor 3 options, for cathodic protection. Not a standard- just seeing what the contractor thinks is the most efficient.

Steel beams- MNDOT- with joint replacements, also to include paint . Michigan- joint replacements- always have to coat the exposed top flange. Use TermaRust? Michigan used it. Stays tacky for a long time. A corrosion inhibitor- don't have to clean as much... other than the tackiness- seems to be working. Wanted it as a easier toolbox thing- to just put it on a bearing, etc. Heard that it's hard to get off if you want to go to another system. Iowa- does galvanized beams over railroad now.

Birds? Bridge in Michigan with 3ft deep of bird poop. Regular I beam with vertical stiffeners, birds flock in there at night. Nebraska- environmental hoops with construction. City bridge with put in stay in place deck forms in the areas that birds might roost. Milwaukee- they put in the spike strips. Michigan they tried that- didn't work. Michigan moveable bridges have a large bird problem- but they flush them. They also have one bridge that just blasts music and keeps the birds away- heavy metal works best. Minnesota falcon center- people work with them to install falcons on bridges to keep other birds away.

Are construction/inspectors/maintenance coordinating with the Design folks about issues that might now work. N Dakota- system that supposed to coordinate- but doesn't quite work. Turnover with bridge maintenance people, but internal goal is to improve the communication. Nebraska- also a problem. They want to give time to give those details to see if they work. Have yearly maintenance meetings- where people can talk. Also problem with turnover, etc. Minnesota- Sarah used to have a system. Most of the new details come from maintenance, and then gets into the standard specs. Construction and Maintenance meetings/conference, etc. that's been key to exchanging information. Iowa- bridges crews get together to talk about it- design also at the meetings, have come away with several changes. Wisconsin- similar- talk about it during the conference to get the conversation going. Fickett- Minnesota- do treatment on cover plate ends.

MNDOT any issues with Teflon bearings? Teflon has rolled up like a rug. Teflon sheet just rolls out. Painters then come through and ruin the bearing. Michigan did have a couple that came out. Nebraska details are different- but MNDOT said they have that and they come out too. Michigan problem with inspectors and knowing how much tilt to rocker bearings are a problem. Good guideline to development of how much tilt is ok, or bad.

Design engineers- What kind of feedback do you want to give back to the state- if something was not constructable? No feedback.

On Steel girders- how many states heat straighten with own crews. Michigan and Wisconsin does. Michigan has one state crew that does all the specialized steel items. Michigan's crew works 6 days a week all year long- full time. TO FHWA- why the 3 times? EJ- accumulation of plastic strain. If isn't getting into the strain hardening range- probably ok, but going into most lab work to get that definite. Starting to see cracks- after the repair- then all that material is supposed to be removed. Inspect it on

high frequency. Aspect of the system, heavy skewed bridge with fascia hit- most concerned about that than a straight bridge. There is a second phase to the study and testing- currently in the development of that phase.