

2013 NEBPP Portland, ME Meeting

Roundtable Questions

1. What percentage of your state's total bridge budget is being invested in Bridge Preservation?

DE: Historically, prior to MAP-21, we spent roughly \$2.5 (12.5%) million on Structure Maintenance Contracts, Paint & Scour Projects (12.5%) for Bridge Preservation out of the Federal Bridge Funds. Our Bridge Design Section spends another \$2.5 million on major rehabilitation projects a year. Therefore, we spend roughly 25% of our bridge funding on Bridge preservation. We have used other funds to perform additional Bridge Preservation type of work activities – such as Interstate Maintenance Contracts.

NY: Depending upon bridge ownership, about 45% - 55% of bridge expenditures are aimed at preservation treatments ranging from deck replacement at the top end to bridge washing at the bottom end.

NJ: 100% of the NJDOT Operations Budget for bridge maintenance is invested in bridge preservation. This includes twelve annual contracts totaling \$55 million in State funds and \$20 million in Federal funds

RI: Total capital budget: \$220 mil.....bridge total: \$50 mil....bridge preservation: \$6 to \$8 million/year (8%+/-)

VT:

A. From the SFY14 bridge program, 23.3% of the interstate (\$14,575,000 of \$62,521,660), 23.8% of the state highway (\$12,993,600 of \$54,633,655), and 6.1% of the town highway (\$1,010,000 of \$16,566,596) bridge budget was allocated towards preventive type maintenance (primarily paint, membrane, slope stabilization, repairs, and culvert projects)

B. This does not include the percentage of dollars being allocated within the OPS program toward bridge preservation efforts (\$6,333,500 appropriated to town highway structures and a percentage of the maintenance appropriation)

ME: 30% (or \$31 M per yr) - based on 2012-13 Work Plan

MA: Varies based on yearly state infrastructure expenditure and is usually 10-20% of MassDOT's total funding for a particular year.

MD: 15-20% for Minor Rehabilitation, Paint, and Overlays

PA: Typically, PennDOT's goal for bridge preservation construction expenditures is \$100M per year (which is 15% to 20% of the total bridge construction dollars).

PennDOT's bridge preservation program began in 2005. Over the last 8 years, PennDOT's bridge preservation expenditures have ranged from \$44M in 2005 (when program started) to \$336M in 2009 (which was the height of our Accelerated Bridge Program). As an average over the last 8 years, we have spent as an average \$130M per year. Looking at from the side of how many bridges we have preserved, we have preserved anywhere from 297 bridges in 2005 (when program began) to 603 in 2009 (ABP). As an average, we have preserved over 430 bridges in the last 8 years.

NH: NH invests a total of \$30Mil annually for its bridges out of federal, state and state betterment funding. Currently, we expend \$8Mil of that amount towards bridge

preservation projects (27%). This does not include bridge preservation for our Turnpike bridges

CT: Current preservation budget for work addressed by State forces, Bridge Repair Units (on-call contractors) and select preservation projects with a full PS&E is approximately 7.5%. Additional actions are addressed within the capital program.

2. What would be an adequate level of funding annually for your Bridge Preservation program?

DE: \$10 million

NY: Again, this varies by bridge ownership. NYSDOT is currently satisfying the majority of bridge preservation needs where those treatment types are suitable.

NJ: Ideally, double the amount of our current allocation would be adequate. This would allow NJDOT to reduce our work order backlog using If & Where Directed contracts and keep bridges in a state of good standing with our Bridge Preventive Maintenance Program.

RI: Based on recent analysis: Approximately \$24 million

VT: Levels tend to fluctuate from year to year depending on many factors but, in my opinion, having a target of around 20% annually for bridge preservation would be ideal. (This doesn't include Operations budget, only Project Development budget)

ME: \$60M annually – Ref. Keeping Our Bridges Safe- Nov. 26, 2007

MA: Presently \$25 million

MD: Adequate funding due to a recent gas tax increase and commitment to maintain bridge funding during economic downturn.

PA: In the past 5 years, PennDOT has invested about \$670 million to preserve over 2,200 bridges. Looking at our SD ON rate, PA has gone from over 400 bridges coming on as SD to around 250 bridges becoming SD. By employing SD prevention strategies on 440 bridges annually and increasing our bridge preservation expenditures to \$200M per year for 10 years (which is \$100M more than what our goal is now), we expect to reduce the rate of bridges becoming SD to below 200 bridges per year. However, due to the constant struggle of seesawing between keeping our bridges and roads in the state of good repair, we are unable to fund the level of \$200M per year for bridge preservation.

NH: Recently the Department's Bridge Design and Bridge Maintenance Bureaus made a presentation to executive management recommending an increase in preservation funding of \$17Mil or a total need of \$25Mil annually. This determination was made through historic deterioration modeling for our state and current bridge conditions.

CT: It is estimated that 15% would greatly enhance the program.

3. What are the top challenges that are impacting your agency's Bridge Preservation program?

DE:

- A. Resource: money and personnel*
- B. Learning curve for proper material selection & application.*
- C. Lack of maintenance friendly bridge designs.*

NY:

A. *Top challenge is a bridge population that includes an interstate era bump or surge of bridges.*

B. *Inadequate funding for the "Capital" bridge program.*

NJ: *Funding is the biggest challenge affecting NJDOT as we are forced to "do more with less." Another issue is the use of annual contracts and contractor forces for bridge repairs. The break-in and learning curve for a new contractor that may be awarded a new contract is very long and takes a toll on the State staff overseeing the contract.*

RI: *FUNDING!*

VT: *Perception that bridge preservation is only making things look better and the funds could be better used for more serious bridge issues; there is also the challenge of competing assets statewide.*

ME: *Competition with higher priority bridge needs ... the cost to avoid posting or closing necessary bridges in Maine is estimated at \$130 M per year. Ref. Keeping Our Bridges Safe, Nov. 2007*

MA: *A yearly continuous steady state funding stream to adequately address bridge betterment construction and design needs throughout the state.*

MD:

A. *Limited design and construction resources to get work done.*

B. *Permitting requirements (i.e. stringent E&S requirements).*

PA: *Our challenges impacting PennDOT's Bridge Preservation Program are the following:*

A. *Dedicated Motor License Fund (approx... \$7B) (which primary supplements our highway program) has nominal growth.*

B. *To further protect our investments in PennDOT's road and bridge assets, PennDOT changed the criteria for posting bridges. This resulted in approximately 500 state and 500 local bridges either being newly posted or posting reduced. So, our focus is changing to address these additional posted bridges.*

C. *The continual competition of roadway projects versus bridge projects is a constant battle in securing funding. PennDOT has virtually eliminated all capacity added projects.*

NH: *Challenges include:*

A. *With limited funding and competing interest (paving) convincing decision makers and legislators to fund needs.*

B. *Legislators understand the need to repair or replace SD bridges (referred to as Red List Bridges in NH) but there is no understanding of bridge preservation needs. It is difficult to get away from the "worst first" mentality and get to the "keep good bridges good" mentality. Our counterparts on the pavement side have been able to get that message out by presenting a \$55,000 per mile to maintain verses \$1Mil a mile to replace message.*

C. *NH state owned bridges (>10 span) are an average age of 54 yrs. old and were designed to a 50 yr. design life at lower design loading.*

D. *Everyone seems to understand that due to the big group of baby boomers about to retire there will be a big drain on the social security system. Unfortunately we have not been able to adequately portray that there is a huge glut of bridges built in the*

60's and 70's when the interstate and the NHS were built that are about to retire (are currently on the pink list) and put an even bigger strain on funding for our highway system.

- E. NHDOT has Bridge Maintenance crews and it's a challenge to both keep these crews and to keep competent personnel on the crews due to funding.*

CT: Funding, staffing and equipment

What are the steps being taken or your recommendations to mitigate these challenges?

DE:

- A. We continue to ask for more money. We have gotten more to use for our yearly Structure Maintenance Contracts.*
- B. Ask for more personnel, but that isn't likely to happen. We have shifted duties around for some of the inspection personnel to assist with Bridge Maintenance activities.*
- C. Communicating problems that we see with certain types of details and/or materials to our Bridge Design Staff to promote better maintenance friendly bridges in the future.*

NY:

- A. Steps to mitigate include:
 - a. Prioritization of preservation funding at statewide program level.*
 - b. Regional state force bridge maintenance crews.**
- B. Buy in from local municipal bridge owners to the preservation philosophy.*

NJ: To mitigate these challenges, NJDOT is trying to issue more site specific, preventive repairs. This will eliminate the creation of new work orders and allow the If & Where directed crews to reduce their backlog of existing work orders.

RI: At the direction of our Director, we have recently completed a "Better Bridge Program" document that outlines our need over a 10 year period to comply with MAP-21 and to improve our national ranking as it relates to the % of SD bridges.

VT: To mitigate this, research is recommended to prove that investment in preservative maintenance allows for the expected service life to be achieved or extended, ultimately resulting in cost savings.

ME: We will continue to program to ensure that the highest priority bridge and highway corridor needs are met. We are attempting to isolate funding for preservation/scour countermeasure projects.

MA: N/A

MD: Use State funds for Minor Rehabilitation.

PA: PennDOT has prioritized (amongst other areas) finding ways to preserve bridges for less money. One of PennDOT's initiatives to modernize and find efficiencies is the Next Generation Project, where currently the Bridge Asset Management Committee within the Next Generation Project is working on various solutions. These include a facility search for the Department to do its own precasting of beams, so bridge replacements can be done in-house. Another solution is development of a recommended lifecycle for

bridge preservation treatments, such as deck overlays and bridge joint replacements, based upon experience. This lifecycle plan will be a planning tool and a cost-savings tool for bridge preservation.

NH: N/A

CT: N/A

4. What tools or mechanisms do you or your bridge program leadership use to communicate the benefits of bridge preservation?

DE:

A. Explain cost benefits of maintaining our bridges to reduce the overall life cycle costs to upper management.

B. Creation of performance measures.

NY: Tools include training at crew level and statewide asset management system including Regional and State Bridge Management Teams.

NJ: NJDOT has a comprehensive internal work order system which shows inspection results, defects, repairs made, cost, and duration of repairs and can be viewed by anyone in the Operations Division of the Department.

A. Monthly reports summarizing contract repairs and expenses are provided to the Commissioner's office

B. NJDOT Communications Office issues press releases at the onset of new contracts to inform the public of work to be performed and its benefits

RI: Better Bridge Program document mentioned above.....executive staff is leading the initiative!

VT: Actually, the opposite showing the impact of not maintain a structure has been used to communicate this. A series of photos taken during biennial inspections has been shared with bridge owners to visually communicate the harsh impact of not addressing a minor draining issue. (Within a short period of time, the bridge had to be restricted.)

ME: Bridge Management Spreadsheets, and Deighton dTIMS CT analysis.

MA: FHWA articles, federal and state funding sources, internet and newspapers posting of project to be completed and successfully completed and on time and articles in professional engineering periodicals i.e. Civil Engineering, etc.

MD:

A. SOS-Reports condition of system including trends, how the money is being spent (i.e. projects and programs), and shows how the money being spent is improving the system.

B. Performance Measures

PA:

A. Annual Report – shows accomplishments, challenges, and milestones per CY; number of bridges preserved and trend of SD bridges is shown

B. Structurally Deficient bridge goals – SD Count and SD DA; 8.0% by 2033

C. LPN – Linking Planning and NEPA – involves Asset Planning to ensure PA's transportation assets can continue to served their intended purpose; performance measures established for pavements and bridges to provide

Planning Partners and PennDOT Districts key measures to drive investment decisions in meeting the overall asset management strategy; for bridges – measures are SD DA; SD Count; Reduce rate of deterioration (SD ON); Keeping non-SD bridges in good repair (preservation)

NH: Communications tools:

- A. The Department has a Bridge Priority List giving every Red List bridge (SD Bridge) in the state a replacement needs priority. The list is established through a combined effort by the Department's Bridge Maintenance and Design Bureaus and vetted through the executive office. This has helped the Department to change its bridge replacement schedule to priority based rather than to have it chasing the paving schedule or political agendas.*
- B. As one of the Department's performance measures for its Balance Scorecard, we are tracking Red List Bridges and trending of these numbers. These measures are published annually along with an explanation sheet that explains why it changed.*
- C. The Department's Commissioner has been a huge advocate for moving away from Capital highway projects to maintaining/preserving what we currently have.*
- D. Thru a needs study done by our Bridge Design and Maintenance management it was shown that our turnpike system is providing an adequate level of bridge preservation funds for their system. This is a good comparison because there is a noticeable higher level of service on that system.*

CT: Performance measures. Work line items are tracked on a monthly basis.

5. What type of activities does your agency's Bridge Preservation program include?

DE:

- A. Preventative Maintenance: painting, joint repair/replacement, pile jacketing, greasing bearings, concrete crack sealing, spall repair, deck overlays, replace bearings and repointing of masonry.*
- B. Rehabilitation: deck replacements, strengthening, superstructure component repair or replacement, bridge rail repair/replacement or upgrade and any of the preventative activities above may be included as well.*

NY:

- A. All treatment types up to rehabilitations including major work such as deck replacements.*
- B. Program Reviews for conformance with established programming guidelines.*

NJ: Twelve contracts are drawn up and bid annually. These include:

- A. Two Bridge Preventive Maintenance Contracts (Site Specific, Federal Funds)*
- B. Three Bridge Painting Contracts (Site Specific, Federal Funds)*
- C. Two Concrete Maintenance Contracts (If & Where Directed, State Funds)*
- D. One Timber/Underwater Maintenance Contract (If & Where Directed, State Funds)*
- E. One Structural Steel Maintenance Contract (If & Where Directed, State Funds)*
- F. One Tunnel/Movable Bridge Maintenance Contract (If & Where Directed, State Funds)*

G. One Orphan Bridge Maintenance Contract (Site Specific, State Funds)

H. One Bridge Rail Repair/Replace Contract (If & Where Directed, State Funds)

RI: Bridge washing, joint repair/replacement/retrofit, concrete repairs (full depth, partial depth, crack sealing), beam end steel repairs, repainting.

VT: Cleaning and painting (protective treatments); deck surface repair and placement of new membrane and pavement; asphaltic plug joint repair or replacement; invert repair/lining of culverts; bridge washing.

ME: Bridge rehabilitation, maintaining wearing surfaces and bridge joints, bridge washing and painting, concrete sealant applications, scour monitoring, miscellaneous repairs and brush removal.

MA: As needed or scheduled construction bridge betterments: deck overlays with fast setting high strength concrete; steel bridge seat jacking and concrete seat repairs; concrete deck restoration (surface and through deck patches); structural steel girder repairs - web and flanges, bearing replacement, bridge washing and cleaning, painting, especially beam ends, bridge end joint repairs, sub-structure repairs, heat-straightening of damaged steel members and others.

MD: Paint, deck overlays, troughs, concrete repairs, paved inverts, joint retrofits, bearing retrofits, steel repairs, wrapping pier columns, wrapping pile bents

PA: Deck: cleaning bridge decks, drainage systems, and bridge seats, cleaning & lubricating expansion bearing assemblies, Deck repairs

Superstructure: Resealing expansion joints; repairing impact damage, bearing pedestal repair, resetting bearings

Substructure: removing debris from waterway channels, underpinning repairs to abutments/piers to address streambed scour.

NH: Preservation Activities include:

Washing and Sealing, Deck preservation (strip, patch, membrane and repave); Expansion joint preservation (replacement of entire joint systems or just the seals); Painting; Rail upgrades; Bearing repairs or replacements; Scour countermeasures

CT: Items for Inclusion in the Connecticut Department of Transportation's Bridge Preventive Maintenance Program:

A. Bridge Deck Drains

- a. Cleaning of existing drain systems including scuppers and weeps*
- b. Repair/Rehabilitation/Replacement of deck drain systems which improve flow*

B. Bridge Painting

- a. Localized Painting of Beam Ends and Cap Girders*
- b. Full Bridge Painting*

C. Bridge Bearings

- a. Replacement of older style bronze/sliding plate bearings with elastomeric bearings*

D. Bridge Joints

- a. Repair/Rehabilitation/Replacement of Bridge Joint Systems*

E. Bridge Cleaning

F. Steel Repairs

- a. Repairs to steel superstructure and or substructure elements*

- G. Concrete Repairs
 - a. Repairs to concrete superstructure and/or substructure elements
 - b. Application of Protective Coatings
- H. Bridge Decks
 - a. Repairs to the deck
 - b. Repair/Replacement of protective systems (Membrane and Bituminous Wearing Surface)
- I. Scour Countermeasures
 - a. Installation of Scour Mitigation measures
- J. Timber Repairs
 - a. Repairs to timber decks and/or superstructure and or substructure elements
- K. Protective Fencing and Rail Systems
 - a. Repair/Upgrade of Bridge Rail
 - b. Safety Enhancements

6. Describe the typical process used in your agency to identify, conduct, and implement the results of Bridge Preservation related research.

DE:

A. University research results may get incorporated

B. Trial & error: try a product or type of construction method to see how it works.

NY: MO Structures Division implementation through technical directives (EIs, EBs, ...) and SSMT distribution to RSMTs.

NJ: NJDOT's State Funded If & Where Directed bridge maintenance contracts have vendor demonstrations and tests for new products. These products undergo testing on more heavily traveled highways to provide the NJDOT Materials Department with test results. The products are then either approved for use or disqualified.

RI: Problem statement is submitted to our research department. The statement is evaluated and ranked. If ranked high enough, a scope of work is prepared and an RFP is advertised. Proposals are evaluated with the highest graded proposal selected. A contract is signed.

VT: A research need would be proposed to the RAC. There is a process requesting solicitation, proposing a project, and eventually a scoring to determine if this is a research priority and warranted.

ME: We are working with the Department's Research Division, the University of Maine, and various consultants on several projects: e.g. alkali-silica reactivity (ASR), finite element load rating software, concrete slab FRP strengthening, on-site load testing, monitoring systems, etc.

MA: If the MassDOT's internal engineering unit intends to utilize a specific new product, we meet with manufacturer rep and then seek approval of the MassDOT's Research & Materials Division.

MD: Limited trials of new technology on low risk area or bridge.

PA: PennDOT conducts a solicitation of Research needs (ITS, pavements, bridges, etc.) from throughout the Department as a Research Program developed annually. The

Research Program is fiscally constrained (we always have more IDEAs than available funding) and prioritized (IDEAs are prioritized at the executive staff level) before it is formally presented to the PennDOT Program Management Committee (which includes the Secretary & Deputy Secretaries) for review and approval. Once approved, the research projects are started, using all available contracting mechanisms – university based agreements and competitive bids.

Concerning implementation, PennDOT does have an implementation program for completed research projects. All projects go through a screening via a “Checklist for Winning Innovations” that determines the potential implementation and communication activities necessary to promote new processes, techniques, etc. In addition, the implementation program helps develop the necessary standards and specifications and publication updates to enable staff to be able to use research results. Also, this information is shared with local governments via the Local Technical Assistance Program (LTAP).

NH: We have no formal Research Program for bridge preservation. The Bureau of Bridge Maintenance tries new materials and processes prior to releasing them to contracted work.

CT: All new and innovative products are directed to the Department’s “New Product Committee for evaluation.

7. What are the top challenges that are impacting the implementation of Bridge Preservation products or innovative technologies?

DE:

- A. Proof of performance*
- B. Familiarity by local contractors – which can affect cost.*
- C. Correct application and limitations of new products/methods.*

NY:

- A. Lack of engineering back up of proposed products*
- B. Reluctance to try new products by owners*

NJ: (Same as above): NJDOT’s State Funded If & Where Directed bridge maintenance contracts have vendor demonstrations and tests for new products. These products undergo testing on more heavily traveled highways to provide the NJDOT Materials Department with test results. The products are then either approved for use or disqualified.

RI: FUNDING and competition with other sections

VT: The obvious challenge if federal funds are used for preservation would be proprietary issues; other challenges are lack of it being a tested and proven technology.

ME: The high costs associated with some of these technologies can be prohibitive.

MA: Consistency of placement and final installation of construction materials used concrete bridge decks and placement equipment. To accommodate time sensitive and limited traffic delayed projects, the need of requiring the contractor to provide two pieces of equipment in the event of equipment failure during construction. Also, the time-line of testing required by MassDOT’s Research & Material department’s for final

approval of a new product that may have been used successfully in other states or other municipalities.

PA: Top Challenges

- A. Complexity of structural products does not necessarily lend themselves to a fast track understanding/evaluation (design review/evaluation intensive).*
- B. Verification of proposed material benefits may be difficult (or costly) after incorporation into the structure (admixtures, membranes, etc.).*
- C. There is a lack of a track record of success for new technologies (performance history).*
- D. Proprietary/patented nature of many products (lack of alternates for competition, license fees, etc.). It is one thing to try experimentally (pilot sites) vs. using as a standard!*
- E. State & Federal rules/policies must be overcome (low bid, sole source, etc.)*

NH: There is a reluctance fully implement innovative ideas that do not have long term proven results. The Department has embraced new technologies in the past that did not live up to their advertised useful life and it has taken many years to recover from that. With bridges that are designed for 75 or 100 year expected life often it is best to move slowly until there is good product history data available.

CT: The top challenge is the time involved to prove the new products.

What are the steps being taken or your recommendations to mitigate these challenges?

DE:

- A. We try to reach out to other bridge owners that may have experience and knowledge.*
- B. Trial installations.*

NY:

- A. Competitive bidding results in "least expensive" product instead of "best" product for the application. Need better contracting methods.*
- B. Product Specifications are difficult to write for specific products – working with FHWA to experiment with new products.*

NJ: NJDOT's State Funded If & Where Directed bridge maintenance contracts have vendor demonstrations and tests for new products. These products undergo testing on more heavily traveled highways to provide the NJDOT Materials Department with test results. The products are then either approved for use or disqualified.

RI: N/A

VT: Often providing the funds is enough of an incentive to mitigate the challenge of using new products or innovative technologies; risk lessens if it is someone else's money.

ME: We will continue to analyze best practices in order to maintain condition, service and safety with limited resources.

MA: N/A

MD: We believe it is prudent to not be on the cutting edge.

PA: Mitigate Challenges:

- A. *Taking a more serious look at other state DOT's product research & approvals as part of our evaluation of new product technologies.*
- B. *Using more individualized evaluations based on a need & risk assessment of the product technology & use itself. This may eliminate field evaluations in some cases, and reduce the duration of field evaluations in other cases.*
- C. *State Transportation Innovation Council (STIC) – a partnership between industry/academia/local governments/FHWA/PennDOT to accelerate the implementation of proven technologies.*
- D. *Modernization/PA Next Generation Initiatives – initiatives for proposing and implementing change in PA/PennDOT in terms of improved processes in terms of efficiency, quality and cost savings.*
- E. *Mapping the Future Initiative w/ PA Turnpike – initiative to better share knowledge, resources and technologies.*
- F. *APEL (AASHTO Product Evaluation Listing) / NTPEP (National Transportation Product Evaluation Program) – these need to be better utilized nationally (by all DOTs) so that proven technologies can be shared and duplication efforts (testing/evaluation) can be reduced when a state chooses to use these programs.*

NH: With bridges that are designed for 75 or 100 year expected life often it is best to move slowly until there is good product history data available.

CT: Regional approvals would greatly enhance the process.

N/A signified no answer provided