



Construction Peer Network Northeast Peer Exchange Summary Report

March 6 – 7, 2012
Warwick, Rhode Island



Hosted by: Rhode Island Department of Transportation



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1 Background

The Rhode Island Department of Transportation hosted the first peer exchange for the Construction Peer Network (CPN) in Warwick, RI on March 6th and 7th, 2012. The Federal Highway Administration (FHWA), in cooperation with the American Association of State Highway and Transportation Officials (AASHTO), the American Road and Transportation Builders Association (ARTBA), and the Associated General Contractors of America (AGC), sponsored the peer exchange. This northeast peer exchange was the first in a series of five regional events that will showcase innovation in construction, allow peers to network and share information, and generate ideas for implementation of innovative practices and processes.

Construction personnel from 12 northeastern States were in attendance at the peer exchange, including Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. Two State agency representatives and one FHWA Division Office representative from each State participated in the peer exchange. A list of attendees, along with contact information for each, is provided as an appendix to this document.

State DOT and FHWA representatives from each State completed the CPN Program Information Tool (PI Tool) survey in December 2011 to provide data and help determine topics for the peer exchange. As part of the PI Tool survey, agencies ranked their priority topics for discussion at the peer exchange. The results from the 12 separate PI Tool responses formed the peer exchange agenda. Five primary topics covering six core elements from the PI Tool emerged.

The five exchange topics (agenda items) were:

- Exchange Topic 1 – Innovative Practices and Tools for Inspection
- Exchange Topic 2 – Project Staffing Levels
- Exchange Topic 3 – Allowing Innovations by the Contractor
- Exchange Topic 4 – Innovative Construction Methods
- Exchange Topic 5 – Performance Measurement

Based on the feedback given by the States and analysis of the PI Tool results, lead states were identified and asked to present their successful practices to the group in order to introduce the topic and initiate discussion.

Within the PI Tool there are questions for each of the six focus areas. The focus areas are further broken into core elements and functions, with the questions at the function level. A core element is a key process that occurs within a particular focus area, and a function is a direct action that is taken to implement the process. The core elements and functions that comprise the PI Tool are a result of a prioritization process the CPN steering team used to determine the final questions.

The core elements (main bullets), functions (sub-bullets), and agenda topic references (listed in parentheses) selected for discussion by the northeast States are shown in the following list. Also

included for each function (sub-bullet) is the number of States that selected the function as a high-value peer exchange topic.

- Documentation and Record Keeping (Corresponds to Agenda Exchange Topic 1)
 - Implement the Digital Jobsite (4 States)
- Innovative Practices and Tools for Inspection (Corresponds to Agenda Exchange Topics 1 and 2)
 - Assess Inspection Levels of Effort with Risk-Based Processes (6 States)
- Project Supervision and Staffing (Corresponds to Agenda Exchange Topic 2)
 - Determine Staffing Levels on a Project (methods to ensure enough staff) (5 States)
 - Determine Staffing Levels on a Project (methods to reduce staffing needs) (4 States)
- Allowing Contractor Innovations (Corresponds to Agenda Exchange Topic 3)
 - Create a Comprehensive Innovative Contracting Process (To Guide in the Selection of the Right Contracting Mechanism for Projects) (7 States)
 - Allow Contractors to Develop and/or Utilize Innovative Construction Methods (7 States)
- Innovative Construction Methods (Corresponds to Agenda Exchange Topic 4)
 - Implement Innovative Practices and Products (5 States)
 - Minimize On-Site Work (i.e. More Prefabrication) (4 States)
- Performance Measurement (Corresponds to Agenda Exchange Topic 5)
 - Develop and Track Meaningful Performance Measures (7 States)

The northeast peer exchange included a mix of presentations and discussion sessions. After one or two presentations about State practices on a topic, an hour of discussion ensued. The following section highlights findings and summarizes the peer exchange discussions for the five exchange topics.

2 Ideas for Implementation – Key “Takeaways” From the Peer Exchange

The peer exchange produced several relevant and practical “takeaways” that could lead to implementation. The key takeaways were identified from the roundtable discussions. Agencies observed these takeaways to have high potential for implementation within their States’ construction program. Stakeholders discussed the following 20 items as practices that held promise for future implementation.

1. Method of Measurement and Basis of Payment for Items –

We can optimize our construction and inspection efforts by specifying the acceptance method of an item. Based on the type of item and/or project, we may elect to measure, pay plan quantity, or use lump sum. Appropriate guidelines should be followed for each. New Jersey conducted a systematic review of all items and assigned them as either “measure” (M) or “pay plan quantity” (P). The challenge of this approach is the time it takes to conduct the systematic review. The payoff is the optimization of construction inspection.

2. Document Quantities with GPS –

When an item is accepted by measuring, GPS can be used to measure the quantity. Connecticut used GPS to measure quantities of an item successfully on two pilot projects. An idea within the peer exchange was proposed to allow the quantities to be measured by the Contractor with State verification. Although this has not been done, there is promise in trying this method. Some challenges with this approach include equipment cost and shelf life. The payoff is the optimization of construction inspection.

3. Complete Project Finals Timely – Tips and Tricks –

- a. No one likes doing paperwork. Connecticut has had success by holding people’s “feet to the fire” until it is complete. Accountability has worked well.
- b. Having a defined process that includes weekly meetings and deadlines between the Owner and the Contractor has worked well for the District of Columbia based on feedback from Contractors.
- c. Allowing the Contractor access to daily diaries and information on material quantities has worked well in Michigan.
- d. Having two-way evaluations of the Owner and Contractor at intermediate points throughout projects has worked well in Maryland.
- e. Including the paperwork required for the project finals as part of the punch list has worked well in Connecticut.
- f. Evaluating the value and need for retainage has benefitted New York.

4. Consultant Costs –

Although consultants are needed to supplement the DOT workforce, they can cost more compared with in-house resources due to loaded costs that include overhead. The Financial Office in Maryland has studied the comparison of consultant vs. State loaded costs. The challenges are that consultants are an expensive method (in the short term) to supplement the

limited DOT staff. The payoff is enhanced information on true consultant (and possibly long-term) costs to allow for detailed comparison.

5. Succession Planning and Mentoring – Tips and Tricks –

- a. In Vermont, five temporary positions were created and filled to allow staff to mentor newer employees in order to fill anticipated vacancies in leadership positions.
- b. Pennsylvania uses independent assurance for construction inspection, which allows for uniformity of construction inspection throughout the State and also allows for mentoring of construction inspectors.
- c. In New Hampshire there is a specialized inspection team that visits every hot-mix asphalt (HMA) paving project. This is not only a way to get specialized expertise on the project, but also a way to mentor construction inspectors that may not be familiar with HMA paving.
- d. The challenge with each of these methods of succession planning and mentoring is additional cost. The payoff is that the owner will be able to mitigate impacts and loss of expertise due to impending retirements.

6. Review Testing and Frequency –

The group brainstormed and discussed the desire to use a risk assessment to systematically evaluate the frequency and need for testing. It is important that we focus on meaningful testing. It may also be helpful to allow for a reduced frequency in certain situations. New Hampshire has conducted a risk assessment of their testing processes. The challenge is the time to conduct the review. The payoff is the optimized use of the limited testing resources. The group at the northeast peer exchange elected to create and submit a research problem statement to the AASHTO Subcommittee on Construction for this topic. The results of this research will help manage the frequency and need for testing more efficiently.

7. Change of Conditions –

In New Jersey a letter is prepared to allow the contractor to proceed, if appropriate, on an overhead, time, and materials basis. The challenge when encountering a change of conditions is owner and contractor risk. The payoff lies in keeping the project moving.

8. Timely Approval of Change Orders –

Several States including New Jersey, Connecticut, and the District of Columbia have streamlined the change order approval process by utilizing mid-level approvals by the project engineer, resident engineer, and construction engineer. Other approvals have been delegated by the construction manual. Vermont has used electronic signatures to streamline the process. The challenge in improving the turn-around time may involve risk on the part of key stakeholders in the process. The payoffs are in minimizing risk and keeping projects moving.

9. Quality Systems for Design Build –

Based on the discussion, it appears that the States are at a variety of different levels with implementation of alternative contracting techniques such as design build. There are also a variety of different methodologies for the quality system being used with design build. Each State, or perhaps several States in the Northeast, could benefit from training on the quality systems for design build. This could include contractors that have completed major projects and

received recognition as well as other experts on the topic. The challenge involves understanding the quality system for a new contracting approach; however, the payoff may be substantial.

10. FHWA Guidance –

In order to streamline contract administration and make optimal use of project staff, some clarifications are needed by the States from FHWA regarding contractor invoicing and progress payments. It is important that each State work with its Division. Because of the potential for streamlining, stakeholders are encouraged to rely on other Divisions and the FHWA Resource Center.

11. Programmatic Review of Construction Inspection for Optimization –

A few earlier topics (Items 1, 2, and 6) encouraged the group to move towards a more optimal use of construction inspectors. A suggestion was made to review construction inspection processes programmatically for optimization. The group learned that there is currently an NCHRP research project with such a scope. The project should be starting in the near future and is anticipated to take approximately 2 years.

12. Contractor's Evaluation of Owner's Design –

After the completion of a construction project, Pennsylvania requests the Contractor's evaluation of the design for that project. Information is used to improve project delivery.

13. Adjust Quality Assurance for the Type of Project – HMA –

There is a growing need to use construction inspection resources optimally. In Massachusetts the Quality Assurance process is adjusted depending on the type of HMA project. A one-size fits all approach is not used due to varying needs for inspection resources based on project type. An NCHRP project to review this topic and provide recommendations is under way.

14. Warm-Mix Asphalt –

Warm-mix asphalt is an emerging materials technology that holds significant promise. It has been used and experimented with in most, if not all, of the Northeastern States. Acceptability of the warm mix additives has been coordinated through the North East Asphalt User/Producer Group (NEAUPG). This effort is being led by NYSDOT.

15. Prefabrication of Small Structures and Decks –

Several States use prefabrication for small structures and decks on construction projects, including Connecticut, Delaware, Maine, New Jersey, and Maryland. This has the tremendous advantage of accelerating construction to minimize user delays in the work zone. It also has tremendous potential for benefits such as improved worker safety.

16. AGC Guidance –

For pre-fabrication practices in urban areas, a consistent message is needed. This practice of using pre-fabricated structures is being used more often. Benefits include accelerated construction and minimizing user delays in the work zone. There are also fewer construction workers on the job site. This construction technique has some opposition because of the

perceived threat of reducing construction jobs. A consistent message from the States and contractors will help to make sure this valuable construction process continues.

17. Marketing projects –

In the District of Columbia and Connecticut there have been formal marketing efforts for projects. Successes have included the understanding of the owner's project need, creation of teams to bid on the project, introduction to DBEs, and others. On large, complex projects this technique has brought more responsive bidders.

18. CPM Scheduling –

There is a growth in the use of CPM scheduling on projects. Valuable information can be obtained, but there is a fine line between too much information and not enough information. Rhode Island and New Jersey have implemented CPM scheduling that has benefited their agencies. Resource loading of schedules can also be a beneficial practice.

19. Dedicated Training –

Generally, agencies have been on a slow hiring pace. As a result there has been less of a need for dedicated training. Agencies in States such as Maryland and Pennsylvania, among others, have maintained their dedicated training for personnel. The Transportation Curriculum Coordination Council is also a good resource for training and also offers a variety of web-based training.

20. Performance Measures – Tips and Tricks –

- New York and Rhode Island conduct formal evaluations to assess the cause for change orders to allow agencies to determine how well the project performed.
- While designers may be measured by how well they meet advertised dates, Connecticut has found that there may be an increase in inferior plans and specifications from this practice.
- Several States consider force account items such as the price adjustment clause or incentives and disincentives when determining if a project met the performance measures.
- Massachusetts, Maryland, Pennsylvania, and New York share performance measures transparently with the general public.
- Consultants are rated on their performance in relation to established measures in New Jersey and Pennsylvania.

3 Peer Exchange Discussion Notes

Each section of this report begins with a table that highlights the agenda items for the topic, including presentation titles and speaker information. The full agenda for the peer exchange is included as an appendix to this document, along with a roster of participants with contact information for each participant. This report is designed to facilitate additional networking and discussion on the topics summarized from the event.

Generally, each discussion session was formatted to fit basic questions for each topic. The questions used to stimulate the discussion include:

- What other innovative practices (related to this topic) have you used?
- What are some of the challenges associated with expanding use?
- What actions can be taken to further implementation?

The sections that follow are structured around the discussion results for these three key questions and include brief introduction along with information from the initial presentations and question/answer sessions. Some discussion sessions varied in structure from this originally planned approach. The session discussion results are summarized under the sections labeled “Practices Used,” “Challenges,” and “Actions Needed.”

3.1 Host Agency Presentation – Sakonnet River Bridge Replacement

Larry Bailey from the Rhode Island DOT presented on a large project in the state. The existing bridge carried 40,000 vehicles per day and was constructed in 1956. The existing bridge had deteriorated steel members due to a failed drainage system (broken pipes and leaking deck joints). The new bridge design included two lanes in each direction and a multi-use path. The estimated completion date for the new bridge is May 15, 2013. Some additional notes from the discussion are captured in this section.

- A foundation test program was conducted as part of the design.
- Used a 72” pipe pile plate insert to save money on the length and depth of pile.
- Came from the design unit—design phase test load program.
- Weather tests were conducted on the materials used.
- Lesson learned in taking the time up front on the risky points of the bridge, currently low change order rates. One claim was submitted for lost time on additional welding.
- Used a floating coffer dam—contractor proposed this as means and methods and it reduced costs.
- Cofferdam had issues between contractor and subcontractor which caused 6 months delays.
- Participants asked questions on cost of stainless steel and lead time on stainless steel. Information was not readily available on these costs.
- Consultant noticed errors in computer program of design; changed to add stiffeners (100k-200k).
- Cost reduction came in use of mechanically stabilized earth (MSE) walls.

- Keys to success included proper planning, thorough plan review, strict enforcement of contract specifications, monitoring quantities for overruns, immediately dealing with extra work claims, schedule tracking, monitoring critical path, addressing all delays immediately, mitigation any RIDOT delays, and partnering with key stakeholders.

3.2 Innovative Practices and Tools for Inspection

10:15am - 10:45am	Exchange Topic #1: Innovative Practices and Tools for Inspection • Eliminating Paperwork in PA	Rebecca Burns, Pennsylvania DOT
10:45am - 11:45am	Participant Roundtable Discussion of Exchange Topic #1	Frank Corrao, Rhode Island DOT

Rebecca Burns from Pennsylvania DOT provided examples of innovative technology applications for inspection and documentation. PennDOT implemented an Engineering Construction Management System (ECMS) with a total cost of approximately \$40 million over 10 years. Participants discussed potential maintenance costs; PennDOT did not have data readily available on ECMS maintenance costs. An IT consultant developed the system, which also includes electronic bid openings, signatures, bonding documents, work orders, change orders, and some contractor documents. The presentation also included a demonstration of a tablet application for inspection documentation and electronic archiving.

Participants asked several specific questions during the presentation, including:

- How do you deal with privileges? We have established roles and security levels for each partner.
- How about dealing with documentation errors? Each role and responsibility manages each document and maintains an audit trail for changes.
- Does the system include shop drawings? No, but working to update the system to include them.
- How are the tablets holding up in the field? They are furnished with enclosures to protect the device.

3.2.1 Practices Used

Discussions focused on several practices currently in use by States in the northeast. Participants offered examples related to the topic and the facilitator asked related questions about specific practices.

Documentation of the discussion is outlined in the following bulleted list.

- Peer reviews to help improve RI documentation with inspection (more detailed information on the construction logs).
 - Did they develop a manual on what good documentation is? Developed memos in bullet form on what to capture.
- RI is in initial stages of contractor invoicing
 - Checks and balances of invoices from contractors.

- Start with more comprehensive information from contractor logs.
 - Some DOTs are not allowed to do contractor invoices.
 - Document acceptance.
 - Daily activity summaries.
 - GPS is used for data collection to provide validation of payments based on quantities.
 - NJ – items that we measure (pile driving) and other such closeout items don't actually get measured but we just use what is in the proposal—pay proposal quantity unless changed in the field. If quantity is off by more than 10% (variation) then there must be a change order. Some DOTs expend effort to measure length of steel to the 1/10 of a foot – items such as this usually are statistically insignificant. Taken care of in upfront specifications. There is a QA issue to make sure it is correct.
 - Quality control at the engineering stage. It makes errors more consistent. Staff is doing quality control. Should be used strategically instead of across the board.
 - Use of GPS by contractors and checking their quantities.
 - What could be used to check their quantities? Independent verification to check quantities.
 - How can States accomplish independent checks and meanwhile stay abreast of current practices? Differences between computers and GPS systems relative to more dated forms of verification. Some have independent sources perform checks.
 - VT – full-depth reclamation contractors—trying to get line item for testing equipment. Contractor to supply equipment to DOT and then they use it. Currently developing independent specifications to check the contractor.
 - Contractor to provide testing equipment. There are several States that have specifications for testing.
 - Some States cannot accept contractor acceptance of their own tests. Inspection must be done by the State.
- Project closeout
 - Measured quantities and or planned quantities from Pennsylvania. Contractors take that into the risk.
 - Project acceptance versus project closeout.
 - Clearly defined difference between the two.
 - Stair step approach to retainage, (physical work, punch lists, etc.).
 - Administrative closeout process while people are still in the field.
 - Use checklists for closeout.
 - Trying to get to acceptance of construction.
 - Some States have eliminated retainage and have been pleased with the process.
 - Most States are using pre-qualifications to build trust between the two partners.

- Contractors are also frustrated with final payment process – need to get together to agree on final quantities. They are also struggling with measuring quantities correctly. Process in place to measure and check quantities. The process is improving. A recurring problem lies in not getting paid in a timely manner because of disputes between quantities.
 - Privileges with quantity approvals. Contractor reaction to quantities.
 - Pre-qualification processes, how much is subjective? Timely, budget, etc.
 - Contractor evaluation form.
 - Positive feedback that is truthful to determine shortfalls.
 - MD – Evaluations are performed to improve construction processes.
 - Payment issues exist; put a deadline on information needed to validate payment status.
 - Focus on a positive message.
- Daily activity summaries.
 - Measured items and per proposal items (NJ).
 - Line item for testing equipment and training (VT).
 - Read only contractor access is provided in some States for progress payment documentation.

3.2.2 Challenges

Several common themes emerged from the discussion on challenges, as outlined in the following bulleted list.

- IT privileges for electronic documentation systems and applications.
- Accepting contractor test results for payment.
- Use of GPS by contractors is often more advanced than the technology used by the owner-agency for quantity checks and comparison – what happens when the results vary?
- Prequalification practices are subjective but can help with performance evaluation.

3.2.3 Actions Needed

Agencies discussed actions needed to further implementation of practices related to this topic.

- Policies for good documentation.
- Documentation acceptance.
- Additional GPS/Electronic data collection cases and examples.
- Comparison of elements of project acceptance versus project closeout.
- Link field work/completion (checklist) with administrative closeout.
- Process for agreement on final payment – needs to be timely.
- Focus on positives/perception of practices.

3.3 Project Staffing Levels

1:00pm - 2:00pm	Exchange Topic #2: Project Staffing Levels <ul style="list-style-type: none"> • Contract Administration - Survival 101 • Staffing Levels and Management of Construction Inspection Resources Through a Work Plan Analysis 	Lewis Cannon, Connecticut DOT Christopher Crachi, New York DOT
2:00pm - 2:30pm	Participant Roundtable Discussion of Exchange Topic #2	Greta Smith, AASHTO
2:30pm - 2:45pm	Break	
2:45pm - 3:15pm	Participant Roundtable Discussion of Exchange Topic #2 (Continued)	Greta Smith, AASHTO

Lewis Cannon from Connecticut DOT presented information on staffing practices as they relate to contract administration. He discussed internal and external techniques to alleviate staffing challenges. Some internal techniques discussed include deferring final closeouts, roving concrete pour/paving inspection teams, enlisting contractor support for QA initiatives, sharing sub-inspectors, blurring district lines, giving chief inspectors multiple assignments, re-assessing warranty provisions, use of tablets/toughbooks, GPS-enabled equipment, sharing workers with highway operations, and proposing alternative contracting methodologies. External staffing techniques include using consultants on a task-by-task basis. A primary challenge noted for CT DOT is the ability to meet FHWA guidelines, union issues, issues with near-term retirements, and procedures for succession planning and follow-up.

Participants asked several specific questions during the presentation, including:

- What requirement do you use for pre-qualification? CT is at the NICET level.
- How do you keep construction inspectors on during the winter when activity is slow? CT has miscellaneous activities across different areas to keep inspectors busy.

Christopher Crachi from New York DOT presented on work plan analysis for management of staffing levels and resources. NY DOT uses categories of staff, including DOT staff, consultants, and other temporary staff. They reconcile staff by the region based on patterns and historical data. The primary drivers of staffing needs and challenges include project costs, location, and work intensity.

3.3.1 Practices Used

- MD staffing based on projections and knowledge of upcoming projects. Contracts are let with consultants for a certain period of performance or up to a certain amount (\$10M)
 - CMCI-Construction management construction inspection.
- Are there any union issues with hiring consultants? There was a desire to cap salaries of consultant staff based on DOT salaries.
 - Consider hiring consultants if you don't have the expertise in-house
- Do DOTs charge inspection staff to Federal-aid jobs? Depends on which job we are working on and how projects are distributed throughout the region.
- What are typical costs relative to total project cost for the engineering (2%-5%)?
- MD – \$90 to \$100k per inspector from contractor staff—MD staff vs contractor staff.

- ME – Inspection of hot mix asphalt requires two staff for those projects.
- New Jersey is a member of an industry group that helps inspection personnel (HMA) maintain certification; they also require contractors and consultants to have certification in HMA. Minimum of two and sometimes three inspectors for jobs.
- How does that effect LPA (local public agencies)? They general use consultant for those jobs.
- Each position has a rate associated with it, union issues with a cap for an engineering position. The Brooks Act only applies to professional positions, not inspectors.
- Wage rates for inspectors—MD use wage rates for DOT staff as the same steps for consultants and contractors depending on when they are qualified.
- Revised Q&As for caps of wage rates and there has to be an evaluation of rates.
- CT—rates are uncapped, but people are jumping ship and bouncing around to different consultants to get a higher rate.
- Michigan has a lifetime ban on retired DOT staff working for the DOT as a consultant.
- Is the Quality Assurance program over inspectors of DOT and contractor staff? PA has 30 people that oversee the inspectors to write 700-1,000 reports on inspectors. There is a mentoring function within the group.
- Innovation towards staffing with new practices. RI uses the same people for all projects no matter the type of project (i.e. Design Build vs Design Bid Build)
 - Put a team together to inspect a project
 - The Contractor is responsible for providing specification material along with quality control testing. The DOT oversees this and performs acceptance and independent assurance testing.
- 80/20 matching funds can be used to pay inspector costs.
- Some agencies use limited service positions to preempt issues with retirement of long-term employees.

3.3.2 Challenges

- Some States have grace periods for DOT staff to work for consultants on DOT projects, while one State doesn't allow retired DOT staff to work as consultants.
- Achieving a level playing field in terms of comparing State staff versus consultants – consultants may be more expensive in a short term view but may provide cost savings in the long term.
- Higher costs from consultant employees moving to most recently awarded contract (a different company) due to higher pay rates.
- Retiring person has long-term position that may not be filled – knowledge is lost.

3.3.3 Actions Needed

- Consistent guidance on salary caps and pay raise information. FHWA is coordinating two webinars on this topic in 2012.
- Guidance on QA programs for inspection.
- Staffing needs projections compared with actual results for program improvement and lessons learned.

- Analysis of actual consultant costs for comparison with projections and with in-house staffing costs.
- Processes for LPA staffing requirements.

3.4 Regional Priorities and Practices

David Hoyne with Vermont Agency of Transportation facilitated this session at the end of the first day. Local agency representatives cited a need for open discussion on topics of interest to the northeastern States, as well as practices they have been successful with.

- VT – SMEs support field staff in environmental, safety, and other areas (viewed as a safe resource).
- RI – similar SMEs support inspectors
- ME – visual acceptance for sidewalks and trails (somewhat of a risk based inspection and acceptance process).
- PA – finding lot sizes for HMA testing – review of 50 States was performed.
- Need guidelines to performing risk-based testing.
- WA did risk-based assessments on particular project types.
- RI – Resource-level risk assessment may need to be performed.
- ME – Resident Engineer given minimum testing requirements guide. HMA for sidewalks and trails do not require materials testing only a visual testing. A technician would verify the product.
- Contractor – bridge bearings do not all need to be tested.
- Include contingencies in contract.
- Need for certifications (hay bales, etc.).
- Skip some tests based on past performance.
- Input from contractors on items.
- Changes approved formally prior to work.
- Contractors will mostly likely wait until getting formal approval before moving forward because of delays in getting paid.
- In DC, the work will stop—some delays can be up to 8 months.
- NJ – contractor required to notify State if change identified (guidance given).
- NJ—Resident Engineer, District Engineer, and one other must approve. Executed within a day. Changes can take up to 2 weeks.
- Contractor letter to proceed on time, materials, and overhead basis or full change order.
- DC – contracting officer issues letter; guidance is phase I and change order is phase II.
- CT – approval to perform work followed by simple approval of change order by management. Formal change order only has 3 signatures. Can pay contractor based on contingent change order. Work to execute formal change order within 30 days.
- Some use of electronic signatures in States for change orders.
- NY – field change payment item.

3.5 Day One Summary and Topics for Implementation

A brief discussion ensued summarizing day one activities. Practitioners discussed several key topics as data that fed directly into the final takeaways for implementation. These topics are ones that practitioners cited as most easily implemented immediately and include:

- Evaluating quality of work from inspectors (PA process).
- Paying plan quantity versus measured quantities without inspecting (Similar to NJ process).
- Sharing specification book/report.
- Adding administrative issues to punch list in final inspection.

Day two began with a discussion on key topics from day one, including additional items that were not discussed the first day. The priority discussion items to begin day two include:

- CT recommends AASHTO materials or construction; prepare a research statement to research the max/min number of tests to break down the acceptable tests. Brenda O'Brien and Colin Franco agreed to draft a scope statement to share with the committee. Reducing the testing requirement to reduce the demand on construction inspectors would be of benefit. Contract administration, testing requirements, and paperwork requirements may all benefit.
- Optimizing construction inspection with a programmatic view to reduce the demand on construction inspector. CT – There is a current NCHRP study on this topic.
- Contractor invoicing – FHWA will allow some States to have contractor invoicing. There should be national guidance for appropriate use. There should be a verification process and the States should verify according to it. There should be progress payments and the State should be able to justify payments. At the end, they should be verified. Certification from the contractor should be subject to final audit process.
- Lump sum items to reduce the burdens of tracking each quantity.
- PA—Asking contractors to give feedback on design plans.

Rich Crawford with the Maine Department of Transportation gave a presentation on Maine's Quality Using Innovative Contracting (QUIC) Team. Maine uses an RFQ process and then issues an RFP to narrow down the list of contractors. Maine has inspectors visit sites to review plans ahead of time and assist in development to cut the review time from 45 days to 2-3weeks. The new process has more of a team environment.

Sean Sheehy from the New Jersey Department of Transportation gave a presentation on providing an environment conducive to developing innovative approaches by contractors. Some of the discussion within this presentation focused on value engineering, staff strains due to the volume of VE proposals, and how to process the cost savings. Pete Getchell facilitated an hour long discussion session after the presentations.

3.6 Allowing Innovations by the Contractor

8:15am - 9:15am	Exchange Topic #3: Allowing Innovations by the Contractor <ul style="list-style-type: none"> • Quality Using Innovative Contracting Practices: Maine DOT's QUIC Team • Allowing Contractors to Develop and Use Innovation 	Rich Crawford, Maine DOT Sean Sheehy, New Jersey DOT Kiran Patel, New Jersey DOT
9:15am - 10:15am	Participant Roundtable Discussion of Exchange Topic #3	Pete Getchell, PKF-Mark III, Inc.

3.6.1 Practices Used

- Construction manager/general contractor – administered the same as design/bid/build.
 - Administration of project is similar to design build.
 - Contract separately with the building contractor and allows the DOT to design its— getting the designer under contract and then getting the constructor under another.
 - Contractor felt the process was fair and DOT had their priorities set.
 - Cost is the risk. DOT developed own cost estimate and then contractor came back with a cost and then the negotiations happened on the final costs.
 - Contractor is setup on an hourly basis to be reimbursed for review and process.
- MA – QA specifications are used.
- RI – Qualifications (A) + sealed price (B).
- NH – 3 to 5 short listed contractors on projects.
- MA – 2% stipend to short listed contractors.
- PA – procurement law restricts processes to low bid procurement only.
- NH – AGC reviews new specifications.
- ME – regular meetings with pavement industry.
- PA – quarterly quality committee meetings.
- RI – regular reviews (quarterly).

3.6.2 Challenges

- DOT cost estimates compared with contractor cost estimates.
- QA versus QC and varying programs (testing).
 - Need to be sure that DOTs are sure they know the definitions.
 - Different levels of projects require different types of projects.
 - Quality needs to be defined and should be based on definition
 - CT – use one size fits all. Maybe there shouldn't be a one size fits all. As we get more comfortable with new ideas, things will get better.
 - Low bid plus an A+B bidding for quality.
 - Incentive on the quality of longitudinal joints. Gone from 88% density to 92% density. Imposing incentive and disincentive results in quality improvement may have benefit.
 - Are we asking for a Cadillac when we need a Chevy?

- Design Build—how do you deal with stipend or short lists?
 - A&B component submit qualifications and max price at the same time-everyone was allowed to bid. They could also submit an alternate proposal. After award there were pluses and minuses added to the bids.
 - MA pays a 2% on maximum, and not sure how the short list is developed, but only short list would be allowed to bid.
 - PA – Design build but it is low bid.
- Innovation – The DOT has to understand the innovation and be open to it.
 - For new specs.-AGC has 30 days to review and comment on the new specs.
 - PA – We have committees such as HMA, Concrete, etc. and perform quarterly meetings.
 - RI – We send draft specs to industry and have a quarterly review.

3.6.3 Actions Needed

- Additional guidance on when to use particular alternative contracting strategies.

3.7 Innovative Construction Methods

10:30am – 11:30am	Exchange Topic #4: Innovative Construction Methods <ul style="list-style-type: none"> • Innovative Construction Methods – Material Transfer Vehicles • Increased Worker Safety in Delaware Through Off-Site Preparations 	Ted Kitsis, New Hampshire DOT Greg, Pawlowski, Delaware DOT
11:30am – 12:45pm	Lunch	
12:45pm – 1:45pm	Participant Roundtable Discussion of Exchange Topic #4	Greg Doyle, FHWA

Two presenters provided practice information during this session, including a presentation by New Hampshire DOT on material transfer vehicles and thermal imaging for inspection and a second presentation from Delaware DOT on innovations in work zone safety. Greg Doyle facilitated a discussion session after the presentations. Some key discussion points during the presentations are shown in the following list.

- How does this effect compaction and or densities? Maybe use these as a quality control measure
- Needs to be some research to determine the effects of the temperature differences before we go and change the industry and costs associated with the changes
- Are any States requiring contractors to measure the timing of materials to the job site? Needs to be uniform.
- Clean and Paint barriers every 6 months as part of cost of installing TCDs

3.7.1 Practices Used

- CMGC workshop will be held in Boston on 5/23-5/24, 2012.
- DC – adapting to stakeholder needs/input early in process for all projects.

- MA – pilot on utility relocation incentives. No dispute resolution process has been established.
- Newer procurement processes help to allow innovation.
- Flexibility in means and methods.
- Risk in cost, training, etc in equipment.
- CT – smaller structures assembled on-site and placed.
- Paving in lower temps/weather.
- Trucking permitting for pre-cast elements.
- New York – Experimented with warm mix asphalt during cold conditions, have other States used warm mix? ME – In many cases contractors are doing that by using warm mix to receive compaction. They are testing and are able to receive compaction for surface mix. DE – Did over heat the mixture for the warm mix, not sure the details.
- PA – warm mix and foamed asphalt and are currently using paving that the gas companies are bonded to maintain the roadways.
- NH – weekend closures for deck replacement – use pre-cast elements.
- CT – balance risk in projects.
- DC – facilitate contractor collaboration (joint ventures arise from construction socials that are held).
- Standard practice/no policy.
- Depth replacements, removing the structure and replacing in one weekend. Weekend closures for bridge replacements.
- Peer networks/clearinghouse/reaching out to other States.
- Innovative IT tools are useful but won't reduce staffing needs.
- Can reduce change orders and time to complete.
- MD – 2 day winter training session.
- Certifications/refreshers are used for various topics and consultants can attend.
- Mass has made a commitment to using more prefab and innovative ideas.
- PA (high level position) has made a commitment to modernization—modified process to shorten the overall process.
- Development of a clearinghouse to help with the generation/residing of new ideas.
- New York –Initiative ideas are more toward the IT side of things.
- RI – Requires schedules for every project. Only complex project are resources driven. The resident engineers concentrate on the two week look ahead. They train every winter and they have coordinating meetings to help with schedule. How are the schedules loaded? Are they resource loaded? Contractor uses resource loading to schedule the project. In NJ, they ask not to resource load the project.
- RI – Check for reasonableness – may have 1 iron crew for one month 20 iron crews for the next month and then the last month they have 1 iron crew.
- There are TCCC courses that are available through NHI website, which should help out with some of the training needs
- In a design/b/b process (low bid)—lump sum maintain traffic, giving the contractor parameters to let them help design.

- NJ temporary lighting scheme. They make the contractor provide the State something.
- NY provides a minimum design, but lets the contractor make alterations to the plans.

3.7.2 Challenges

- What is the contractor’s role in innovation? Some of the new procurement processes are helping the process along. Meeting with stakeholders to get their input into the process. With bidding alternatives there are more alternatives for innovation. If it is a one off, it is not cost effective—lease equipment and training staff might be the best option.
- Crashworthiness of innovative devices
- Bridge assembly off site and then dropping into place. Consider the permitting requirements for trucking in the precast elements. There is a lot of coordination that needs to take place to store and transport each of the elements

3.7.3 Actions Needed

- Leverage the money in our ports and other revenue streams.
- Develop schedules that include resource loading.
- Develop policies for use of innovative techniques.

3.8 Performance Measures

1:45pm – 2:15pm	Exchange Topic #5: Performance Measurement <ul style="list-style-type: none"> • Targeting Performance with On Time On Budget 	Corren Johnson, Maryland SHA
2:15pm – 2:30pm	Break	
2:30pm – 3:30pm	Participant Roundtable Discussion of Exchange Topic #5	David Hoyne, Vermont DOT

Corren Johnson from the Maryland State Highway Administration presented information on performance measurement in Maryland. The presentation focused on the policy “on time and on budget” for projects. The goal is to keep the percent of construction budget within 5% of the estimate for 25% of projects. For “on time” specifically, MDSHA works to keep 15% of projects within the original completion date. David Hoyne from the Vermont Agency of Transportation facilitated a one-hour discussion session after the presentation.

3.8.1 Practices Used

- Maine, Michigan, Massachusetts and Delaware all have performance measures established and in use.
- RI – Contractors are bidding performance in the construction process. In most cases they are not accepting change orders that will extend the contract POP or cost. Scope creep is occurring. Only using change order for safety reasons.
- Change orders have different categories – Safety, Environmental, etc.
- PA – Have several performance measures used to evaluate projects and help with project closeout.

- MD uses a percentage of the total dollars for construction.
- MA has a score card available on the website that is available to see how they are doing.
- Tracking change orders as a percent of projects or percent of cost—MI process is based on program level, not project level.
- VT breaks it down by program areas.
- Do you give your information to the legislators? In PA it is part of the governor's metrics. NY is project by project and is available on their website.
- PA—everything is driven by performance measures. Developing quality metrics that are published once a quarter.
- DC developed a performance plan; contractor certifies it and they are accountable.
- MA developed an office of performance metrics.
- Nationally, we are looking for a few performance measures in 8 or 9 categories, a couple of parameters with pavements and bridges. More performance measures are common in system operations (reliability, congestion, etc.).
- FHWA only uses International Roughness Index (IRI). Less than 90 is good; above 170 is poor.
- Agencies cite use of performance goals, and measures should support those goals – on time on budget is a primary goal.
- VT – 3/4 of projects within 5% of baseline schedule, <15% of projects to exceed original completion date.
- Use scope creep and changes (variation in type) as metrics.
- Allowance items such as price adjustments in contract/excluded from change order metric.
- Use percentage total amount relative to total costs.
- DC – consultant performance plan with metrics for evaluation.
- NJ – annual ratings – quality, schedule, budget.

3.8.2 Challenges

- Reaching out to non-traditional stakeholder groups. Legislators are key PM stakeholder and have interest in seeing this used more.
- Priority projects often drive the use of performance measurement – what do we do with lower priority projects in this sense?

3.8.3 Actions Needed

- FHWA – system operations performance measures are being developed, including guidelines – the most applicable to construction are PMs for pavement and bridges.
- Need guidance on quantitative versus qualitative measures.
- Consider critical projects with higher potential impact to establish completion metrics.
- Come up with a plan to define what is good for your State based on the priority of the roadway.

Appendix A – CPN Northeast Peer Exchange Agenda

Day 1 – Tuesday, March 6

Chris Schneider, FHWA (Moderator)

Time	Topic	Presenters / Facilitators
7:00am – 8:00am	Continental Breakfast	
8:00am – 8:30am	Welcoming Remarks	Michael Lewis, Rhode Island DOT Butch Wlaschin, FHWA-HQ Peter Osborn, FHWA-Rhode Island
8:30am – 8:45am	Self Introductions	All Participants
8:45am – 9:30am	<ul style="list-style-type: none"> An Overview of the Replacement of Sakonnet River Bridge #250 	Larry Bailey, Rhode Island DOT
9:30am – 10:00am	<ul style="list-style-type: none"> Summary of PI Tool Analysis & Results Peer Exchange Overview 	Tim Luttrell, SAIC Chris Schneider, FHWA
10:00am – 10:15am	Break	
10:15am – 10:45am	Exchange Topic #1: Innovative Practices and Tools for Inspection <ul style="list-style-type: none"> Eliminating Paperwork in PA 	Rebecca Burns, Pennsylvania DOT
10:45am – 11:45am	Participant Roundtable Discussion of Exchange Topic #1	Frank Corrao, Rhode Island DOT
11:45am – 1:00pm	Lunch	
1:00pm – 2:00pm	Exchange Topic #2: Project Staffing Levels <ul style="list-style-type: none"> Contract Administration – Survival 101 Staffing Levels and Management of Construction Inspection Resources Through a Work Plan Analysis 	Lewis Cannon, Connecticut DOT Christopher Crachi, New York DOT
2:00pm – 2:30pm	Participant Roundtable Discussion of Exchange Topic #2	Greta Smith, AASHTO
2:30pm – 2:45pm	Break	
2:45pm – 3:15pm	Participant Roundtable Discussion of Exchange Topic #2 (Continued)	Greta Smith, AASHTO
3:15pm – 3:45pm	Discussing Other Regional Priorities	David Unkefer, FHWA
3:45pm – 4:00pm	Ideas for Implementation	Tim Aschenbrener, Applied Pavement Technologies
4:00pm	Adjourn	
Dinner on your own		

Day 2 – Wednesday, March 7

David Unkefer, FHWA (Moderator)

Time	Topic	Presenters / Facilitators
7:00am – 8:00am	Continental Breakfast	
8:00am – 8:15am	Recap of Day 1 Discussion – Challenges and Themes	Tim Aschenbrener, Applied Pavement Technologies
8:15am – 9:15am	Exchange Topic #3: Allowing Innovations by the Contractor <ul style="list-style-type: none"> • Quality Using Innovative Contracting Practices: Maine DOT's QUIC Team • Allowing Contractors to Develop and Use Innovation 	Rich Crawford, Maine DOT Sean Sheehy, New Jersey DOT Kiran Patel, New Jersey DOT
9:15am – 10:15am	Participant Roundtable Discussion of Exchange Topic #3	Pete Getchell, PKF-Mark III, Inc.
10:15am – 10:30am	Break	
10:30am – 11:30am	Exchange Topic #4: Innovative Construction Methods <ul style="list-style-type: none"> • Innovative Construction Methods – Material Transfer Vehicles • Increased Worker Safety in Delaware Through Off-Site Preparations 	Ted Kitsis, New Hampshire DOT Greg, Pawlowski, Delaware DOT
11:30am – 12:45pm	Lunch	
12:45pm – 1:45pm	Participant Roundtable Discussion of Exchange Topic #4	Greg Doyle, FHWA
1:45pm – 2:15pm	Exchange Topic #5: Performance Measurement <ul style="list-style-type: none"> • Targeting Performance with On Time On Budget 	Corren Johnson, Maryland SHA
2:15pm – 2:30pm	Break	
2:30pm – 3:30pm	Participant Roundtable Discussion of Exchange Topic #5	David Hoyne, Vermont DOT
3:30pm – 3:45pm	Ideas for Implementation	Tim Aschenbrener, Applied Pavement Technologies
3:45pm – 4:00pm	Feedback on Peer Exchange, Next Steps, and Closing Remarks	David Unkefer, FHWA
4:00pm	Adjourn	



Appendix B – CPN Northeast Peer Exchange Roster

Representing	Name	Company/Agency	Position	Address1	Address2	Tel	Fax	e-mail
AGC Rep.	Jeff DiStefano	Harrison & Burrowes Bridge	Vice President/COO	PO Box 335	Glenmont, NY 12077	518-465-6254		jd659krum@aol.com
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ARTBA Rep.	Scott Leach	The Lane Construction Corporation	Regional Vice President - Northeast Region	P. O. Box 103	Bangor, ME 04402	207-945-0873 ext. 167		SALeach@laneconstruct.com
DDOT	Abdullahi Mohamed	District DOT	Supervisory Civil Engineer	55 M Street SE, 4th Floor	Washington, DC 20003	202-671-4614	202-671-4710	abdullahi.mohamed@dc.gov
DDOT	Wendy Peckham	District DOT	Program Manager	55 M Street, SE	Washington, DC 20003	202-671-4581	202-671-4710	wendy.peckham@dc.gov
MDSHA	Corren G. Johnson	Maryland SHA	Chief, Construction Support Section	7450 Traffic Drive	Hanover, MD 21076	443-572-5202	410-787-8320	CJohnson24@sha.state.md.us
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DelDOT	Gregory G. Pawlowski	Delaware DOT	Area Engineer	800 Bay Road P.O. Box 778	Dover, DE 19903	302-760-2256	302-739-8282	Gregory.Pawlowski@state.de.us
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PennDOT	Rebecca Burns	Pennsylvania DOT	Chief, Bureau of Project Delivery	P.O. Box 2855	Harrisburg, PA 17105	717-787-6989	717-787-7567	reburns@pa.gov
NYSDOT	Christopher Crachi	New York State DOT	Associate Civil Engineer	Office of Construction 50 Wolf Road	Albany NY 12232	518-485-1835	518-485-8948	ccrachi@dot.state.ny.us

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MassDOT	Dave Spicer	Massachusetts DOT	Construction Claims Manager	10 Park Plaza, Suite 7360	Boston, MA 02116	617-973-8823	617-973-8038	david.spicer@state.ma.us
RIDOT	Michael Lewis	Rhode Island DOT	Director	2 Capitol Hill	Providence, RI 02903	401-222-2481 x4001	401-222-2086	mlewis@dot.ri.gov
RIDOT	Frank Corrao	Rhode Island DOT	Deputy Chief Engineer	2 Capitol Hill	Providence, RI 02903	401-222-2468 x4202	401-222-4953	fcorrao@dot.ri.gov
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MaineDOT	Richard Crawford	Maine DOT	Multimodal Program Manager	State House Station 16	Augusta, Maine 04333	207-624-3437	207-624-3401	Richard.Crawford@maine.gov

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