



Construction Peer Network Midwest Peer Exchange

Midwest Summary Report

July 10-11, 2012

Detroit, Michigan



Hosted by the Michigan Department of Transportation



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1 Background

The Michigan Department of Transportation hosted the Construction Peer Network (CPN) Midwest Peer Exchange in Romulus, Michigan, July 10-11, 2012. The CPN's purpose is to widely deploy proven, effective construction practices that will benefit the U.S. transportation system and the American people.

The CPN is a collaboration of the American Association of State Highway and Transportation Officials (AASHTO), the American Road and Transportation Builders Association (ARTBA), the Associated General Contractors of America (AGC), and the Federal Highway Administration (FHWA). The Peer Exchange was the second in a series of five regional events aimed to showcase innovation in construction, allow peers to network and share information, and generate ideas for implementation of proven practices and processes.

Construction leaders from the States of Iowa, Indiana, Illinois, Kansas, Kentucky, Michigan, Missouri, Minnesota, Ohio, and Wisconsin attended the peer exchange. A representative from the Utah Department of Transportation (UDOT) participated to help UDOT prepare as host to the third Peer Exchange scheduled for November 2012. Two



State agency representatives and one FHWA Division Office representative from each State participated in the Peer Exchange. The list of attendees, along with contact information for each, is provided as an appendix to this document.

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The Peer Exchange agenda was designed from State DOT survey responses using the CPN’s Program Information Tool (PI Tool). Based on analysis of the PI Tool results, lead states were identified to present their successful practices in order to introduce the topic and initiate the roundtable discussions. The five exchange topics are listed below in Table 1.

Table 1. Peer Exchange Agenda Topics

Agenda Topic	Construction ‘Core Element’ category	Number of states selecting as Peer Exchange topic	Lead state
1. Implementing the Digital Jobsite	Documentation and Record Keeping	6	Kentucky
2. Using Innovative Methods to Resolve Contract Claims and Disputes	Contract Conflicts and Claims	6	Ohio
3. Implementing Innovative Practices and Tools for Inspection	Innovative Inspection Practices	5	Illinois
4. Allowing Contractors to Develop and/or Utilize Innovative Construction Methods	Innovative Construction Methods	4	Contractor Representatives
5. Developing and Track Meaningful Performance Measures	Performance Measurement	5	Missouri

Within the PI Tool there are questions presented in six construction focus areas. The focus areas are further divided into core elements and further into 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 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” identified by group roundtable discussions. State DOT, FHWA and contractor representatives highlighted the following 27 items as practices that held promise for future implementation within their States’ construction programs. Web site links are provided for some of the practices currently in use by the Midwest States. Documents referenced are also available from those individual States, although not available online. Use the state references along with contact information included in the appendix to gather more information for implementation.

Agenda Topic: Host Agency Presentation

1. Best-Value, Performance-Based Contracting (Michigan)

Special Experimental Projects No. 1 (SEP 14) – Alternative Contracting can be used with appropriate approvals. A composite score of the technical proposal and bid amount is used to select the successful bidder. Consideration is needed when evaluating the technical merits of a bid with the lowest responsible bidder. The M-39 (Southfield Freeway) project was very successful. The constituents were extremely pleased with the project outcomes.

- http://www.fhwa.dot.gov/programadmin/contracts/sep14_mi_m39.cfm

Document Reference: Innovative Contracting Practices, Special Experimental Project No. 14, Best Value – Performance Based Contracting, M-39 (Southfield Freeway)

2. Alternative Contracting: Project Selection Guide (Michigan)

Selecting the contracting method that is the best fit for specific projects is an important decision. The Michigan DOT has an Innovative Contracting Manual that has guidelines to assist in making this decision.

- All Michigan DOT Manuals and Guides:
http://www.michigan.gov/mdot/0,1607,7-151-9622_11044_11367---,00.html
- Michigan DOT Innovative Construction Contracting Manual:
http://www.michigan.gov/documents/mdot/Innovative_Construction_Contracting_340000_7.pdf

There is also a pooled fund study hosted by the Colorado DOT that is being conducted at the University of Colorado at Boulder by Keith Molenaar. A guidebook for selection of alternative contracting for a project is under development. Participants in the pooled fund include DOTs from Colorado, Georgia, Iowa, Minnesota, Minnesota, Montana, North Carolina, and Texas.

- Pooled Fund information - <http://www.pooledfund.org/Details/Study/489>

3. Design Build On Demand (Michigan)

During the construction of the Gateway Project, the Michigan DOT had a need to start work on the project quickly. By having consultants available, work started within one month. It seems that every DOT should have a contingency plan to start work on a project very quickly. This could be accomplished by having consultants available via a delivery order contract or in-house DOT staff trained.

Agenda Topic: Digital Jobsite

4. **Electronic Signatures (Michigan)**

When electronic signatures can be used for items like change orders, there are a lot of advantages. Benefits include the fact that business processes are accelerated dramatically, there is less paperwork, and contractor payments are accelerated.

Document Reference: Documents prepared by the Michigan DOT for implementation of electronic signatures:

- Press Release;
- Attorney General's decision and instructions for use
- Contract Modifications.

5. **Electronic File Cabinet (Michigan)**

Full implementation of the digital jobsite has not yet been achieved. SiteManager has made much progress toward reaching that goal, but there are still some challenges. There is a need to have an electronic "file cabinet" for construction documents. The Michigan DOT is exploring a comparison of Document Express and ProjectWise for use as the electronic "file cabinet."

6. **Electronic Data Integrity (Utah)**

In computer lingo, "gingo" means garbage in, garbage out. It is important to have check of the information that is entered into the electronic database. Utah DOT has one person assigned to review documentation entered electronically on large projects. The person has secretarial or administrative skills.

7. **Innovative Training Delivery Techniques (Minnesota, Michigan, Washington State)**

Training delivered via innovative media such as YouTube can be effective at reaching DOT, contractor, and consultant staff. The training can be taken just-in-time, there is less in-state travel, and email links can be provided for questions. Michigan DOT has made major changes to their specification book and users needed easy-access training on the updates. YouTube training on modules 1 to 3 is now available. Minnesota DOT has also used YouTube for training delivery. Washington State DOT has made this training available for materials testing. This training can also be done collaboratively and shared.

Agenda Topic: Resolving Contract Claims and Disputes

8. **Partnering (Ohio)**

The Ohio DOT has placed emphasis on reducing claims and expediting their resolution. This begins with a new era of partnering. It is a culture, not a strategy. Therefore, it becomes a way to do business in Ohio on all jobs. It is required by specification.

Document Reference: PN 11 – 07/20/2012 Facilitated Partnering

9. **Partnering Tips and Tricks (Wisconsin, Ohio)**

- For large projects, co-locate DOT, contractor, and FHWA staff from design through construction.
- Build relationships early because it all boils down to relationships.

- The digital jobsite is a great goal, but don't over use it. Remember, personal communication often alleviates issues before they arise.
- Use communication enhancement tools (early risk assessment, requests for information, time frames, and chain of command). See link for "PCEE Tools." <http://roadwaystandards.dot.wi.gov/standards/admin/index.htm>
- Focus on project issues such as chain of command and avoid "fluff" discussions and exercises (i.e. If you were an animal, what kind would you be).
- Focus on decisions at the lowest level by encouraging and empowering. Make sure staff members understand that some mistakes will be tolerated. It is not the end of the world.
- Realize that escalation will occur if there is indecisiveness and/or inconsistency.
- Partner on small projects. In some cases the small projects can be taken for granted and result in more issues.
- Conduct financial audits on claims.

10. Dispute Review Boards (Ohio)

The Ohio DOT has defined issues, disputes, and claims. There are definitive processes for each that have specific steps and timelines. These are defined in the specifications.

- Specific interest is on the use of a group or committee and the role of the advisor.

Document Reference: PN 10 – Draft - Dispute Resolution Board Process and PN 10 – 07/03/2012 Dispute Resolution Advisor

11. NHI Claims Avoidance Course (NHI Web site, Indiana, Minnesota)

There is a great deal of turnover within each of the DOTs. Training is needed to keep newer staff educated. Indiana and Minnesota DOT have sponsored "Managing Highway Contract Claims: Analysis and Avoidance" from NHI to reinforce the role of the project staff. The course has received very good reviews. This has been repeated every three years or so. See link: http://www.nhi.fhwa.dot.gov/training/list_catalog.aspx?cat=&key=claims%20avoidance&num=&loc=&sta=%25&typ=&ava=&str=&end=&tit=&lev=&drl=

12. Lessons Learned from the Feedback Loop (Kentucky, Ohio)

Reflecting on the successes and lessons learned on a project allows for continual improvement. The Ohio DOT has a review team analyze change orders and frequency of Value Engineering Change Proposals (VECPs) that are submitted. Trends are identified and adjustments made in the appropriate business processes. The Kentucky Transportation Cabinet documents lessons learned from post-construction reviews. See link:

<http://transportation.ky.gov/Highway-Design/Pages/Lessons-Learned.aspx>

Agenda Topic: Other Regional Priorities

13. Field Services Environmental Engineer (Michigan)

The Michigan DOT has a position to serve as a liaison between the State's Environmental Department, the DOT's Environmental Program, and the DOT's Engineering Program. This position has been effective at communicating and collaborating the priorities and needs of each of the three parties.

Document Reference: Position Description and Program Duties

14. Real-Time Variable Message Signs (Illinois, Minnesota)

In some cases the actual traffic queues from construction exceed the previously anticipated length of queue. The back-of-queue can be a safety hazard. There have even been fatalities when unsuspecting motorists encounter the back-up prior to work zone signs. The Illinois DOT and Minnesota DOT have successfully used real-time messages on VMS to state “stopped traffic ahead.” The message on the VMS is triggered by the actual traffic that is backed-up.

Document Reference: Illinois DOT specification and Minnesota DOT specification

15. Employee Development and Succession Planning (Utah, Indiana, Iowa, Illinois)

It is important to offer advancement opportunities to our testers and inspectors. Bringing new staff into our industry is needed to fill vacancies. Training and rewarding them is important to keep them interested, involved, and progressing in their jobs.

Utah DOT Transportation Technician Review Policy:

<http://www.udot.utah.gov/main/uconowner.gf?n=15066102447485416>

Document Reference: Indiana DOT – Highway Technician Program Guidelines, Iowa DOT - Three Technician Class Descriptions, and Illinois Road and Transportation Builders Association (IRTBA) Emerging Leadership Academy Agenda

16. Oversight With Diminishing Resources – Contractor Testing (Missouri)

Administering the contract in these economic times is becoming more difficult. There is a strong desire to keep construction engineering costs low. Also, it has been difficult to maintain staffing levels of the past. One idea is to use the contractor’s testing in the acceptance decision.

Document Reference: Missouri DOT Contractor Quality Management specification

17. Oversight With Diminishing Resources – Prioritization (Iowa)

The Iowa DOT has had some limitations placed on construction inspection staff regarding the use of overtime. This becomes problematic when the contractor works longer hours during the hectic construction season. Some guidance has been developed for the construction inspector to prioritize the items of inspection.

Document Reference: Iowa DOT - Construction Inspection Priorities

18. Oversight With Diminishing Resources – Implementable Research

There is research underway: NCHRP 10-89 is to create Guidebook for Optimal Construction Inspection. RFP for NCHRP 10-89: Guidebook for Optimal Construction Inspection (currently under contract):

<http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3168>

Further, new research project will be funded this fall for Risk Analysis of Materials Testing and Construction Inspection. RFP for NCHRP 10-92: Risk Analysis for Materials Inspection, Testing and Acceptance (pending):

<http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3403>

Agenda Topic: Innovative Practices and Tools for Inspection

19. Laser Scanning (Illinois)

Laser Scanning can be used to measure various items including earthwork quantities and damage to a bridge girder from an oversize vehicle. The research sponsored by the Illinois DOT to explore the effectiveness of this technology has been documented in a report at the following links.

The research website: <http://ict.illinois.edu/index.aspx>

The report: <http://ict.illinois.edu/Publications/report%20files/FHWA-ICT-10-068.pdf>

20. Expert System for Scheduling (Illinois)

The Illinois DOT developed an expert system to assist with scheduling. It is used to select the contract time. It provides updated guidance to account for production rates, weather, fabrication times, special events, and other factors. It is an excellent training tool for new estimators and is a good check for those that are experienced. The software will be released and available in the near future.

The research website: <http://ict.illinois.edu/index.aspx>

The report: <http://ict.illinois.edu/Publications/report%20files/FHWA-ICT-11-089.pdf>

21. Hiring Retired Contractors for Estimate and Schedule Reviews (Utah)

The Utah DOT has updated their accuracy at preparing engineering estimates for cost and time. They have hired retired estimators from contractors. The accuracy of their estimates has significantly improved.

22. Magnetic Imaging Technology (MIT) (Ohio, Wisconsin, Iowa)

The Ohio DOT has a specification using the MIT for dowel bar alignment. The Wisconsin DOT has experimented with its use for that application. The MIT is able to quantify the alignment of the dowel bars based on translation, skew, and tilt.

The Iowa DOT has used MIT to measure the depth of portland cement concrete pavement non-destructively. A metal plate that is 0.6 mm thick is placed on the subgrade prior to paving. This is used for projects with greater than 50,000 square yards.

Document Reference: Ohio DOT specification - MIT for dowel bar alignment and Iowa DOT specification – MIT to measure the depth of Portland Cement Concrete pavement.

23. Intelligent Compaction

Intelligent compaction (IC) has been used successfully by several of the states. It appears to work better for embankment materials than for asphalt paving on density, but also provides a check of the rolling pattern for HMA. For embankment materials, it appears to work better for granular materials than for clays. Information for IC, implementation, and findings from the pooled fund study are available at:

<http://www.intelligentcompaction.com/>

24. FHWA Loaned Equipment Program

The FHWA has a Friction, Texture, and Profile Measurement Equipment Loan Program. It allows for the use of the latest equipment and test methods to measure pavement texture and friction and achieve smoother, quieter pavements. Sponsored by FHWA's Pavement Surface Characteristics (PSC) Program, the initiative allows State transportation agencies and partnering

academic institutions the opportunity to evaluate different types of PSC measurement devices at no charge. Equipment currently available through the program includes three Circular Texture Meters (CT Meters), three Dynamic Friction Testers (DF Testers), two GripTesters®, and one Highway Friction Tester (HFT).

For more information about the CT Meter and DF Tester equipment loan program or to make a loan request, visit www.appliedpavement.com/techResources_equipLoanProg_home.html.

Agenda Topic: Allowing Contractors to Utilize Innovative Construction Methods

25. Training for Asphalt Pavement In-Place Recycling

In-place recycling technologies include hot in-place recycling, cold in-place recycling, and full-depth reclamation. More information is available from the Asphalt Recycling and Reclaiming Association (ARRA) at <http://www.arra.org/>. ARR offers free courses on several topics.

NHI has recently released a 2-day training course, “Asphalt Pavement In-Place Recycling” that covers the best practices for these technologies. It is course number 131050 (a brand new course that should be in the course catalogue in the near future).

26. Value Engineering Change Proposals (VECP) (Missouri)

It is very common to allow contractors to submit VECPs. If accepted, the savings to the project are split 50-50 with the contractor. Missouri DOT has encouraged more VECP by allowing practical design changes that are relatively simple. The project savings from these changes are shared with the contractor, but at 25% share.

<http://www.modot.org/valueengineering/VECP.htm>

Agenda Topic: Performance Measures

27. Performance Measures (Missouri)

State DOTs are at different levels in their development of performance measures. The latest federal highway bill, MAP-21, will bring a new era of greater performance measurement. Information on Missouri DOT’s performance measures being tracked is included in the following link: http://www.modot.mo.gov/about/general_info/Tracker.htm

3 Peer Exchange Discussion Notes

This section provides additional notes following the organization of the agenda. 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.

After Michigan’s Host Agency Presentation, each presentation discussion session covered the questions below and the following notes are structured similarly.

- 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?

3.1 Host Agency Presentation – Gateway Project

Tia Klein from the Michigan Department of Transportation presented on a large project in the state. She discussed topics such as litigation issues, short turnaround to get contractors on board to get the project built, unique construction techniques, and the public-private agreement that was a major part of the project.

After the presentation, participants asked questions and discussion ensued. The following bullet points outline the main topics discussed during the question and answer session.

- How was coordination between contractors on Gateway project handled? Initially, coordination was minimal between contractors. At times, the contractor (a bridge company) would come to MDOT to let them know certain items needed attention.
- What process was followed for procurement? MDOT used a best value procurement with two technical proposals. The contractor that MDOT did not select did not challenge the bid – there was a \$6 million dollar difference in price and big difference in technical score.
- The 2nd project used random tests and quality measure that were easy to meet. The thresholds were determined on each area – 25 tests per area. MDOT probably should have required more tests.
- How did you handle local hires since they cannot be used if federal money is involved? There was no federal money on this project. In the technical proposal, the contractor outlined a plan for alleviating any issues. The contractor defined “local” and detailed how they were going to meet the requirement. The contractor had a job fair and hired many locals for project.
- Were there any concerns about the technical score being higher with a higher price and how that would be evaluated? MDOT made the technical proposal evaluation criteria very specific, which provided the detail needed for contractors to adequately bid.
- Would you bring in the 3rd independent estimator in earlier in the project to help expedite the process? Construction Manager/General Contractor (CMGC): an independent contractor, consultant estimate, and independent estimator reviewed each of the cost estimates. When we brought them on they were in the design stage - typically they bring them in at 15-20% design. They brought them in at the 80% level, which is later than normal. Define the CMGC process to make it clear to everyone.
- Do you think 3D modeling would help with projects like this? 3D modeling is usually only used on larger projects because of cost and longer time to complete. On more complex projects, they do use 3D modeling.
- MDOT has an innovative unit manual that helps with innovative contracting practice selection. They will help with ongoing support to each MDOT group.
- MDOT is also trying to get the community more involved via surveys and presenting the data to the community on the test results and utilize the feedback to make improvements.

3.2 Topic 1: Implementing the Digital Jobsite

10:15am - 10:45am	Exchange Topic #1: Implementing the Digital Jobsite <ul style="list-style-type: none"> Challenges in Field Documentation 	Steve Criswell, Kentucky Transportation Cabinet
10:45am - 11:45am	Participant Roundtable Discussion of Exchange Topic #1	Mark Chaput, Michigan DOT

Steve Criswell from the Kentucky Transportation Cabinet gave a presentation on innovative technology applications used in Kentucky to enhance the digital jobsite. Specifically, he discussed challenges in project documentation and highlighted Kentucky’s Construction Engineering Management Program that was developed in-house to generate estimates and replace paper reporting. He also noted use of SiteManager, ProjectWise, Outlook, and electronic plans as tools used to help automated processes and store information electronically. He outlined practice to use some of these tools to assist with inspection documentation. One of the primary challenges cited includes field access to some of the electronic tools and field personnel familiarity with the tools.

3.2.1 Practices Used

Discussions focused on several practices currently in use by States in the Midwest. 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.

- MoDOT – Electronic signatures for change orders to help speed up the process. Contractor issues being paid in a timely manner. MoDOT uses Adobe Acrobat for signatures.
- Utah experimented with a few software packages but is currently using Adobe Acrobat.
- MDOT – Performed cost analysis for savings based on not using nine million pieces of paper (almost \$2.5 million dollars). Using Adobe Acrobat to create signatures.
- MI – made significant changes to specification book and decided to develop a YouTube video to train contractor, locals, and field staff on changes. Also developed modules (20 minute modules in PowerPoint) to discuss the differences between 2003 and 2012 specifications.
- UT – looking at software companies to have all of these pieces to talk with each other (scheduling, documentation, etc.).
- MODOT is piloting iPad and Laptop use and is working with software company to transfer iPad information to SiteManager. Looking into developing an iPad application for an inspector guidebook.
- Iowa uses string-less paving for PCC projects. Equipment has GPS for paving and grading. Stake-less construction – the GPS is not accurate enough for paving but good for grading. Development of a statewide network is underway. Topcon uses lasers to help with the accuracy with GPS in combination with lasers.
- Iowa in 2nd year of use of a web based internet filing cabinet application. All submittals are uploaded to the online application. Field staff and contractors can do all the necessary documentation. Contractors upload in necessary information in PDF format. Used just for construction projects. Iowa division is getting into Express web application. No IT security

issues. Infotec has developed it and they pay on a project basis. All construction documents are electronic.

- MI uses ProjectWise but it is not integrated with other systems.
- WI – all as-builts are electronic using basic adobe for format.

3.2.2 Challenges

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

- challenge exists when new innovations surface – reluctant to try it since so much is invested with SiteManager. Tough to balance and each state likely is would not develop their own system.
- Contractor – need XYZ coordinates for utilities to show where things are located. Getting information from utility companies or use GPS data. Gateway project used Ground Penetrating Radar to identify utilities. For the next generation, it would be good to have. There is pilot project to have a po that identifies what type of utilities and the location within the area.
- MN – payroll issue. Contractor will submit payroll electronically. System is robust and can be shared with the contractor and more than one person can see everything.
- One issue may be in sharing the contractor mix design.
- UT – need to avoid garbage in/garbage out with electronic tools.
- KY – problem with ProjectWise—field engineer doesn't have access to ProjectWise in the field. They need to go into the office to print issues out. Some engineers aren't knowledgeable on tools.
- UT – use ProjectWise to help organize over 100,000 documents. On bigger projects, have gone 100% digital (design plans and cost estimates). Firewalls separate the DOT from contractors. There are some issues with where everything is stored and access.
- Contractor – scanning technology for receipts has emerged and is very useful. Can scan a document that with character recognition software and values are inserted into spreadsheets. This saves time.
- All people have to use digital signature for the entire document to get preapproved ahead of time.
 - MoDOT – issues with certified payrolls. Use both SiteManager and adobe signature with an attachment.
 - IN – use SiteManager and have about the same issues as KY. Data collection in the field is the main issue with SiteManager. How do you tie everything together with ProjectWise? They don't currently tie in with other systems.
- Quality assurance – include subsequent actions if there are fields missing within SiteManager.

3.2.3 Actions Needed

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

- Need guidance on how to include independent assessments by third parties to help with the dispute/claims process.

- In the future it would be helpful to schedule payments with field operations software.
- FHWA is coming out with some apps that may help.
- New SiteManager software us scheduled for completion in 201 (more of a web-based atmosphere/ environment).

3.3 Topic 2: Using Innovative Methods to Resolve Contract Claims and Disputes

1:00pm – 1:30pm	Exchange Topic #2: Using Innovative Methods to Resolve Contract Claims and Disputes <ul style="list-style-type: none"> • Enhanced Partnering/Claims Process for Dispute Resolution in Ohio 	Gary Angles, Ohio DOT
1:30pm – 2:30pm	Participant Roundtable Discussion of Exchange Topic #2	Mark Miller, Indiana DOT

Gary Angles from the Ohio Department of Transportation presented on enhanced partnering and claims processes for dispute resolution. The presentation outline some of the goals associated with the process including enhance safety, longer lasting projects, enhanced environmental stewardship, and enhanced quality. ODOT has specification for the dispute resolution and administrative claims process that outlines two types of partnering – self-facilitated partnering and facilitated partnering. The type of partnering used is based o the size of project. For a cost of greater than \$ million, options include facilitated partnering and the use of a dispute resolution advisor or dispute resolution board.

3.3.1 Practices Used

- Illinois has a pattern process helps the claims move quickly.
- Ohio has change order review team that helps resolve some of the issues.
- Wisconsin mirrors the Ohio DOT process trying to resolve claims before issues arise. Project communication enhancement tools and risk assessments help with issue identification and claims.
- Ohio – the process identifies potential issues in the preconstruction meeting.
- IN – has large numbers of claims, but d not allow arbitrator but do mediation.
- For dispute resolution advisor in Ohio – how is that person selected and who pays for it? In draft stages of how they are selected. DOT selects two and contractor selects two. Cost wise, ODOT pays 100% up to a claim then claim resolution would be split 50-50 with contractor. There are established pay rates for advisors.
- FHWA – utilities are supposed to be moved prior to letting. If utilities are to be moved by the contractor, there needs to be a signed agreement. Handle upstream before the project is let.
- IN – utilities have a large lobby in their state and are prohibited from claims against the state.
- Iowa – utility has a large lobby; coordination with utility companies is key to avoiding issues later.
- MoDOT – claims are on most of our largest projects. Design/build projects – collocating our design staff with contractor and construction staff and FHWA.
- IN – in 2005 had n process for claims; now working through a process with notification upfront.

- WisDOT – non compliance provides for the bulk of the claims. They are not tied to warranties.
- OH – recent claim on concrete warranties surfaced.
- MN – engineers of record are the ones that are responsible for resolutions of claims. NHI claims avoidance class is taken every 3 years to help everyone learn the process.
- MoDOT – contractor has to show that there is a loss. If claim is less than 300k, it is binding.

3.3.2 Challenges

- Many claims are because of utilities and pre-letting issues that roll into the contract. Need to take care of the issues earlier in the process.
- Laws may prohibit contractor from making claims against the state during a government shutdown; however, the project work may continue and new issues may arise.
- MN – auditors do not make engineering judgment calls only financial assessments.

3.3.3 Actions Needed

- It would be good to know what to concentrate or focus efforts on for mitigating potential impacts from future claims (utility, weather, ROW, environment, etc.).
- Audit function to be allowed for all claims. Contractors who are well organized typically have claims that are easy to process. This role is strictly a financial audit. Documentation of this process may help other states.
- Contractor – The better the DOTs can support their lower level staff, the lower number of claims. There are many who are afraid to make decision at the lower levels.

3.4 Other Regional Priorities - Ideas for Implementation (open session)

- WisDOT – staffing levels, critical items, and risk based inspection are used to accomplish goals.
- Utah – quality management in having contractor to perform some of the tests that DOTs would otherwise do. Statistical based analysis to determine if they are performing adequately.
- Quality management on bigger projects such as Design/Build.
- MoDOT – looking to do it on all the projects to reduce overall labor costs.
- Iowa – established highway technician series for both maintenance and construction staff for cross-training for the summer and winter (new hires). Staff are being cross trained—created a bridge in maintenance to move through the DOT. Restriction for no overtime and flexible work week to distribute the hours.
- WisDOT – moving to contractor staffing, QMP (quality management program).
- MN – hiring out testing consultants to perform tests to observe and report to front line.
- KS – area construction engineers can supplement their staff with consultants.
- WisDOT – 80% of projects are run by consultants. Iowa does not use consultant inspection very often (2% of projects), Illinois varies by district (10% of projects overall), Kansas – local projects are 100% consultants, state projects 30%. Kentucky - consultant supplement crews (5%); MI (varies 70% for the metro area and 30-35% overall); MN –state contracts have less than 10% run by consultants; MoDOT has 1-2%; Ohio – 10%; IN - local projects are primarily run by consultants.

- IA – Succession planning: maintenance, materials testing, etc. (3 levels) to show how they can move up the ranks.
- K has progression for maintenance (up to 20% pay raises).
- Road builders—Illinois has leadership training and Iowa has a leadership academy to help with making decisions; MN – training is provided in-house.
- Best practices for local agency oversight
 - Iowa has developed guide that documents how staff members are applied to local assistance and policy development with lots of control and oversight.
 - Wisconsin uses management consultants – have 1-2 per region to assist the construction consultant, most are let through the state system. Consultants have region responsibility and they do oversight. Cost becomes an issue.
 - Ohio must use prequalified consultants.
 - Indiana - doing something similar and providing training for locals.
 - Missouri – developed training for LPAs and provides guidance.
- Environmental challenges and innovative practices
 - MoDOT – program for 5 “green” practices and awards named after particular trees.
 - MI – created a position for environmental operations engineer that coordinates with multiple agencies to assist with environmental issues.
 - IL – has issues when stock piling soil because agencies want to test the soil for contaminants that may be present regardless of construction activities.
 - UT – banking wetlands (also used in MI, OH, WS).
 - Recycled shingles for asphalt paving.
 - Storming water regulations exist each state.
- MO – required contractors to submit safety plan for each project that includes information on personal protective equipment, emergency plan if something occurs, covers mandatory drive through to review signs, and discusses risk.
 - If state comments, do they take ownership? State is not going to enforce the plan; however, they want to see a safety plan that covers the issues. Intended to raise awareness of safety.
 - Joint conference on safety to spark discussions with departments and contractors and to address safety concerns.
 - Army Corps of Engineers has a similar plan requirement.
 - MN District 1 – they do not like the idea, as it provides too great of a risk that gets transferred to the owner.
 - Iowa – safety related issues with railroad – personnel are required to go through training.
 - CO – girder erection plans; safety standout programs that are within the contracts.
 - Cell phone policies that discourage or prohibit use are also in place in several states.
- IL – string of bridges that collapsed while under repair. Have policy to have demolition plan sealed by a structural engineer.
- IL – provision to have TTC engineer: contractor pay item to review the work zone setup/plan.

- IL – issues with crashes leading up to a queue. Managing traffic leading up to a queue and trying to get information to truckers are challenges. Strategies to monitor work zone queues are used.
- MO – director made a statement about no crashes happening upstream of signs.

3.5 Day One Summary and Topics for Implementation

4:15pm – 4:30pm	Ideas for Implementation	Tim Aschenbrener, Applied Pavement Technologies
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brief discussion allowed for summary of 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:

- Electronic signatures need to be priority. Collaboration between states (lab testing, inspector guides) and develop applications or YouTube videos.
- Best value and performance based contracting provide for a promising practice.
- Innovative contracting guide and environmental operations engineer (position description). These are both Michigan practices.
- Disputes and claims are shared interest among the group. Interested into looking into the different practices for resolution.
- NHI claims avoidance class should be utilized regularly.
- Pros and cons to Document Express and Dispute Resolution Advisor are needed for information sharing and potential use by others.
- Partnering and specialized training are interesting and we are putting more emphasis on it. Also staff turnover and innovative ways to handle succession planning.
- Quality management and would like to see some information on Design/Build and risk based inspection.
- Brand new class descriptions that allows personnel to cross over multiple categories. Cross classification may be useful.

3.6 Topic 3: Implementing Innovative Practices and Tools for Inspection

8:15am – 8:45am	Exchange Topic #3: Implementing Innovative Practices and Tools for Inspection <ul style="list-style-type: none"> • Evaluation of Laser Scanning for Construction Applications • Expert Systems Approach to Highway Scheduling 	Ted Nemsky, Illinois DOT
8:45am – 9:45am	Participant Roundtable Discussion of Exchange Topic #3	Joe Jurasic, FHWA-Iowa

Ted Nemsky from the Illinois DOT presented information on laser scanning for construction applications. He also outlined an expert systems approach to highway scheduling. Researchers at the Illinois Center for Transportation Projects assisted ILDOT with the research and the analysis and findings for both of these topics. The first project focused on evaluation of LiDAR, or Light, Detection, and Ranging to provide xyz coordinates relative to scanner origin to provide for mobile mapping capabilities and for

evaluation of earthwork quantities. The expert system was developed as a software tool to guide design engineers through the process of highway scheduling.

question and answer session generated the following discussion items.

- Is data transfer and storage a problem? No, equipment hooks up to a laptop.
- How widespread is the use of the scheduling software? We are just now starting to use it. It is not proprietary, so it is available to anyone.
- How accurate is the scanner? Around the 400 feet mark (this scanner was 3 years old).
- How about cost effectiveness? There was a cost savings – 1.5 days for field work with scanner and 3 days for surveyors.
- Which manufacturers provide these types of technologies? Trimble, Topcon, and Leica.

3.6.1 Practices Used

- Iowa method for NDT magnetic imaging technology for concrete testing. MITSCAN device. Measures the thickness of concrete. Using this as their method for payment on 50,000 CY. \$15-20 for each unit.
 - Wisconsin: uses them for dowel bars.
 - FHWA has an equipment loaner program. MITSCAN and 3D scanners.
 - Coring is performed if there is a disagreement over an item.
 - KY – doing an inspection to investigate projects and unfortunately finding some big problems with GPR.
- Iowa has a materials report that provides requirements. Acceptance requirements are included for pay items.
- MN – May use stratified random test such as the Colorado example. One test in every 10 units – can use random number to select a sample for testing.
- WisDOT has a state audit bureau review their tests.
- Iowa has a verbal policy – no cert no pay.
- MN – has a project that has 4 rollers to do the entire mat. Will get feedback this year.
- MN – looking at the Texas truck mounted laser to measure the deflection for QA.
- KY – similar to MN but also require stakes for assuring appropriate locations.
- IA pooled fund study for intelligent compaction is underway.
- IA is using technology mostly on PCC projects and has been pleased with quality. It is optional.
- MN/KY use handheld GPS units.
- Mo – using string-less construction and has performed some pilot projects for intelligent compaction.
- What are states using for IRI and road quality? MI is using IRI; percent improvement is used. OH uses smoothness specs and profile for rough spots. WI has contractors measure it and state does quality assurance.
- FHWA loaner program is very good program.
- Utah has hired an ex contractor scheduler and estimator and they have improved the process.

3.6.2 Challenges

- Wireless maturity meters have the potential to help get roadways opened to traffic quickly.
- Cell Phone usage: in truck only and superintendent or resident engineer only.

3.6.3 Actions Needed

- Contractors are looking into it technology on equipment for location referencing but haven't purchased. Most beneficial thing is feedback to the operator.
- Need to look into electronic signature on iPad and iPhone.
- Need additional guidance/policies for cell phone usage on project sites.

3.7 Topic 4: Allowing Contractors to Develop and/or Utilize Innovative Construction Methods

10:00am - 10:30am	Exchange Topic #4: Allowing Contractors to Develop and/or Utilize Innovative Construction Methods • Benefits of Re-HEAT Hot-in-Place Recycling for Resurfacing	Charlie Gallagher and Pat Faster, ARTBA/Gallagher Asphalt Corporation
10:30am - 11:30am	Participant Roundtable Discussion of Exchange Topic #4	Greta Smith, AASHTO

Pat Faster from ARTBA/Gallagher Asphalt Corporation presented on the benefits of recycling and reusing asphalt in-place. This technology has cost advantages and also allows for shorter resurfacing project durations.

3.7.1 Practices Used

- MI – good success with value engineering during the design process. VECP (over \$25 Million).
- Performance based specification from MI to be provided
- MI receives about 12 VECP during the construction phase. They have the standard 50-50 split of the financial saving. One project on I-75 had an accelerated schedule from years to year.
- MO is doing a 25% split for VECP during construction for simple ideas. The challenge they face is when to apply the 25% split and the 50% split.
- OH – Performance specs. Risks are too high and contractors don't want to take the risk.
- OH – They have found that Design-Build encouraged contractor innovation. They allow "equal or better."
- UT – Performance-based specifications are being used more often. It does require a new mindset to adopt and use these specifications. They have been successful.
- MO – Allows a contractor to use a specification that has been approved in any other state. If it's good enough for use in another state, then MO will accept it for their project. It must be referenced.
- Training on in-place asphalt recycling is available from the National Highway Institute or the American Recycling and Reclaiming Association (ARRA).

3.7.2 Challenges

- For VECP during construction, there has been a general trend for decreased submittals because they are commonly being rejected. Contractors do not want to take the time to prepare VECPs

only to have them rejected. Also, there can be some challenges with the additional risk that the contractor assumes.

- Performance-based specifications require a different mindset than the traditional method or end-result specifications. There is a learning curve to gain a level of comfort with them.
- Proprietary issues make it difficult to use some products.

3.7.3 Actions Needed

- SOC and SOM should update existing or develop new performance based specifications.

3.8 Topic 5: Developing and Tracking Meaningful Performance Measures

12:45pm - 1:15pm	Exchange Topic #5: Developing and Tracking Meaningful Performance Measures <ul style="list-style-type: none"> • MoDOT's TRACKER System 	David Ahlvers, Missouri DOT
1:15pm - 2:15pm	Participant Roundtable Discussion of Exchange Topic #5	Mike McGee, FHWA-Missouri

David Ahlvers from Missouri DOT gave a presentation on the MoDOT TRACKER System. MoDOT has developed a host of performance measures for use at both the project and program levels.

3.8.1 Practices Used

- WisDOT – developed a tool that pulled information from Site Manager.
- K – annually by divisions they established own performance measures related to their office. How many subcontractor office requests, claims, etc. Finals on time – trying to improve on this measure.
- MN – times to award, on time projects may be good measures.
- How big of a unit does MoDOT have for performance measurement? Unit is in community relations area (2 people).
- WisDOT – there is a big emphasis now, but no resources to do it. Biggest effort is in setting things up and how to set it up to be able to mine the data.
- MI – track a lot of stuff but not a measure of how we are doing but how field is doing.
- Iowa tracks amount of contract modifications to measure performance of designers.
- ODOT, WisDOT, and ILDOT track change orders and have a lot of information that feeds back into the process (utilities, contractors, consultants, etc.).
- K did survey to compare the use of consultants and costs for public sector personnel.
- IL compares to construction costs.
- WisDOT estimates that public sector employee use is 20% cheaper than private.
- 3.8% of construction cost for state and 7% of construction cost for private was cited by one attendee.

3.8.2 Challenges

- Developing achievable and measurable performance goals.
- Developing the most appropriate goals that will provide the greatest benefit and lead to evaluation and improvement in practices that can directly affect those goals.

- Competing measures across districts within the agency and balancing the objectives of each group.
- Mining the data is one of the most difficult things to do.

3.8.3 Actions Needed

- Have a good relationship with your legislature. To feed information to them. Try to be transparent.
- The dollar amount spent on damages might be a good measure to track for States.

Appendix A – Midwest CPN Peer Exchange Agenda

Day 1 – Tuesday, July 10

Chris Schneider, FHWA (Moderator)

Time	Topic	Presenters / Facilitators
8:00am – 8:30am	Welcoming Remarks	Randy Van Portfliet, Michigan DOT Russ Jorgenson/Ted Burch, FHWA-Michigan
8:30am – 8:45am	Self Introductions	All Participants
8:45am – 9:30am	<ul style="list-style-type: none"> Gateway Project – Freeway Construction at the US/Canadian Border – Unique Features and Lessons Learned 	Tia Klein, Michigan 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: Implementing the Digital Jobsite <ul style="list-style-type: none"> Challenges in Field Documentation 	Steve Criswell, Kentucky Transportation Cabinet
10:45am – 11:45am	Participant Roundtable Discussion of Exchange Topic #1	Mark Chaput, Michigan DOT
11:45am – 1:00pm	Lunch	
1:00pm – 1:30pm	Exchange Topic #2: Using Innovative Methods to Resolve Contract Claims and Disputes <ul style="list-style-type: none"> Enhanced Partnering/Claims Process for Dispute Resolution in Ohio 	Gary Angles, Ohio DOT
1:30pm – 2:30pm	Participant Roundtable Discussion of Exchange Topic #2	Mark Miller, Indiana DOT
2:30pm – 2:45pm	Break	
2:45pm – 4:15pm	Discussion on Other Regional Priorities (any topic)	David Ahlvers, Missouri DOT
4:15pm – 4:30pm	Ideas for Implementation	Tim Aschenbrener, Applied Pavement Technologies
4:30pm	Adjourn	

Day 2 – Wednesday, July 11

David Unkefer, FHWA (Moderator)

Time	Topic	Presenters / Facilitators
8:00am – 8:15am	Recap of Day 1 Discussion – Challenges and Themes	Tim Aschenbrener, Applied Pavement Technologies
8:15am – 8:45am	Exchange Topic #3: Implementing Innovative Practices and Tools for Inspection <ul style="list-style-type: none"> • Evaluation of Laser Scanning for Construction Applications • Expert Systems Approach to Highway Scheduling 	Ted Nemsky, Illinois DOT
8:45am – 9:45am	Participant Roundtable Discussion of Exchange Topic #3	Joe Jurasic, FHWA-Iowa
9:45am – 10:00am	Break	
10:00am – 10:30am	Exchange Topic #4: Allowing Contractors to Develop and/or Utilize Innovative Construction Methods <ul style="list-style-type: none"> • Benefits of Re-HEAT Hot-in-Place Recycling for Resurfacing 	Charlie Gallagher and Pat FASTER, ARTBA/Gallagher Asphalt Corporation
10:30am – 11:30am	Participant Roundtable Discussion of Exchange Topic #4	Greta Smith, AASHTO
11:30am – 12:45pm	Lunch	
12:45pm – 1:15pm	Exchange Topic #5: Developing and Tracking Meaningful Performance Measures <ul style="list-style-type: none"> • MoDOT's TRACKER System 	David Ahlvers, Missouri DOT
1:15pm – 2:15pm	Participant Roundtable Discussion of Exchange Topic #5	Mike McGee, FHWA-Missouri
2:15pm – 2:30pm	Break	
2:30pm – 3:15pm	Discussion on Takeaways for Implementation	Tim Aschenbrener, Applied Pavement Technologies
3:15pm – 3:30pm	Closing Remarks, Feedback on Peer Exchange, and Next Steps	Greg Johnson, Michigan DOT David Unkefer, FHWA
3:30pm	Adjourn	

Appendix B – Midwest CPN Peer Exchange Roster

Company/Agency	Name	Position	Email Address
AASHTO	Greta Smith	Program Manager for Construction & Materials	gsmith@aaashto.org
Applied Pavement Technologies	Tim Aschenbrener	Consultant	taschenbrener@appliedpavement.com
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