



AASHTO
Subcommittee
on
Construction

2016

Big Sky, Montana
August 14th to August 19th



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MEETING MINUTES

**AASHTO Subcommittee on Construction
Annual Meeting
August 14, 2016 – August 19, 2016
Big Sky Resort
Big Sky, Montana**

Monday August 15

8:00 AM – 9:30 AM Opening Session

Welcome to the SOC, Malcolm Dougherty, Subcommittee Chair, CalTrans

Welcomed everyone to 2016 AASHTO SOC meeting. Thanked Mike Tooley, Kevin Christensen and the Montana DOT for hosting. Thanked David Hoyne and the Section Chairs for the work they do for the subcommittee. Thanked FHWA and the sponsors. Appreciates the attendance from public and private sectors.

Introduced Mike Tooley, Director of Montana DOT, VP of WASHTO.

Montana Department of Transportation Welcome – Mike Tooley, Director

Welcome to Big Sky, MT. Welcomed everyone to Montana and shared some history of the state. Emphasized the importance of safety and encouraged everyone to share their ideas and experiences.

Introduced Lt. Governor Mike Cooney, Montana's 32nd LT. Governor

Welcome to Montana- Lieutenant Governor Mike Cooney

Welcomed everyone to Montana and provided information the state's demographics and their unique transportation and infrastructure needs. Emphasized how important tourism is to Montana and how transportation and tourism are very closely linked.

AASHTO Update – Keith Platte

Mr. Dougherty then introduced Mr. Keith Platte, AASHTO. Mr. Platte provided an overview presentation on the following AASHTO topics:

(See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- AASHTO is a member organization
- Committee Structure Update
 - Will be finalized by Annual Meeting in November, Boston

- SOC will not experience any change
- New structure will create more interaction between subcommittees
- SHRP2- Products that are a value to SOC members
 - R07
 - Vermont, Maine, Missouri, Alabama,
 - R06B- Techniques to Fingerprint Construction Materials
 - Alabama, Maine, Tennessee
 - R06D- Advanced Methods to Identify Pavement Delamination
 - California, Florida, Minnesota, New Mexico, Texas
- AASHTO/ARTBA/AGC
 - Discussion Papers
 - Considering Risk Allocations Among Parties
 - Implementing the Use of Open Data
 - Revising Partnering: Avoiding and Resolving Disputes
 - Promoting Positive Messaging of Improved Project Delivery and Importance

FHWA Welcome – Kevin McLaury, P.E., Division Administrator, FHWA Montana Division

Mr. Dougherty introduced FHWA Division Administrator Kevin McLaury.

- Mr. McLaury encouraged next-level thinking and the use of innovation. Also encouraged the use of performance-based approaches and performance measures.

SOC Self Introductions – Subcommittee Members

At this point, Mr. Dougherty invited delegates to provide self-introductions. Forty-three (43) State DOTs, the District of Columbia and one Canadian Province (ON) were represented at the meeting, as well as representatives from AASHTO, FHWA, AGC, ARTBA, ACPA, NICET, Academia, and the consulting and contracting industry. Representatives from the following member States were present:

AL, AK, AR, AZ, CA, CO, CT, DE, FL, GA, IA, ID, IL, KS, KY, LA, ME, MI, MN, MO, MS, MT, NC, ND, NE, NH, NM, NV, OH, OK, OR, PA, RI, SD, TN, TX, UT, VA, VT, WA, WI, WV, WY.

9:30 AM – 9:45 AM Break

At this point, a 15 minute break was taken.

9:45 AM – 11:30 AM General Session

Moderator – David Hoyne, Subcommittee Vice Chair, VAOT

Mr. David Hoyne, Vermont AOT and Vice Chair of the Subcommittee opened the General Session. He introduced the speakers below.

Overview of the Two Medicine River Bridge - Bruce Kates, P.E., Jacobs and Associates

The presentation addressed the following topics (*See [AASHTO SOC Annual Meetings](#) web page to view presentation*):

- Project Introduction
 - 520' main span

- 49' width
- FONSI
- Bid Process
 - A+B Bidding
 - A= contract dollar amount
 - B= days to completion
- Foundation
 - Drilled shaft
 - Cross hole sonic logging (CSL) testing used
 - Very large pier footings,
- Substructure
- Cantilever Construction
 - Discussion of the use of form traveler and construction from pier tables.
 - Discussion of the post tensioning
- Conclusions
- Q&A:
 - Chemical cooling used for mass concrete?
 - Not in this case. Did not need it for the footings.
 - Fly ash and silica fume reduced heat of hydration
 - CT: Disputes or discussions on longitudinal PT?
 - Satisfied
 - Was the caisson testing a state cost?
 - Yes
 - Claim on footer issue or pier table out of balance?
 - No claims on project.
 - Stressed importance of Montana being in front
 - Partnering used on this project?
 - No
 - Any other CSL anomalies?
 - None other than the wagon wheel
 - Did they finish on time?
 - Yes.

Transportation and Sustainability in Yellowstone National Park: A 144 Year Journey- Jim Evanoff, retired, Yellowstone National Park

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings web page to view presentation](#)):

- Hamilton, MT Forest Fire Discussion
 - 9000 acres burned,
- History of Yellowstone National Park
- Park is currently looking for ways to encourage the use of mass transit.
- Park recycling process
- Transportation, wildlife and recreation balance

Federal Highway Administration Update- Rob Elliott, FHWA

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- FAST Act
 - Dec 2015- 5 years of funding stability
 - \$305 billion
 - Various other initiatives
- EDC-4
- Alternative Contracting Methods
 - ACM Library
- NHI & other Trainings

11:30 AM – 12:00 PM State Discussion Topics

Moderator – David Hoyne, Subcommittee Vice Chair, Vermont AOT

At this point, Mr. Hoyne opened up the meeting for State Discussion Topics (See Appendices C, D and E for Questions and Answers discussed). The Subcommittee then adjourned for lunch.

12:00 PM – 1:15 PM Lunch

1:15 PM – 4:00 PM Section Group Meetings

After lunch, Section meetings were held as follows:

- | | |
|---|--------------------------|
| • Safety, Environmental and Workforce Development | <i>Canyon/Lake</i> |
| • Integrated Construction and Technologies | <i>Obsidian/Dunraven</i> |
| • Roadways & Structures | <i>Lamar/Gibbon</i> |
| • Contract Administration | <i>Madison/Gallatin</i> |

4:00 PM- 4:15 PM

NTPEP Update- Ross “Oak” Metcalfe, Montana DOT & Darby Clayton, West Virginia DOT

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Overview of the National Transportation Product Evaluation Program
- Provided information to the states so they can make informed decisions for their programs.
- NTPEP does not evaluate brand new products. Does not pass or fail products. Does not replace QA.
- Intent is to simplify product evaluation.
- \$17k/year for a member-state
- Construction Products, Traffic Safety Products, Maintenance Products
- How to incorporate NTPEP into a QA program.

4:15 PM – 5:00 PM Section Chair Reports

Safety, Environmental and Workforce Development: Rob Wight (Utah DOT)

Integrated Construction and Technologies: Greg Mulder (Iowa DOT)

Roadways and Structures: Marc Mastronardi (Georgia DOT)

Contract Administration: Gary Angles (Ohio DOT)

5:00 PM ADJOURN

The meeting was adjourned for the day by Mr. Hoyne at 5:00 pm.

5:00 PM – 6:00 PM Optional Evening Presentation

Termination for Default, Preparing for the Worst- Scott Lowe, Trauner Consulting Services, Inc. This optional session by Mr. Lowe provided a presentation and discussion on the above topic for interested attendees. (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Terminating contracts for a contractor default.
- Contractually based event
 - Typically Section 108 in Specs
- Termination for default is a last resort decision
- Three areas to consider: Overpayment, Waiver, Interference
 - Owner has legal obligation to surety not to overpay contractor.
 - Waiver- permitting contractor to do work even when they aren't meeting specs
 - Delays in completion (time extensions given by the State DOT)
 - Interference with the contractor's performance
 - "Cure period" time given in specs for contractor to fix their failures.
- State procedures should convert termination for default to termination for convenience.
- Default vs. convenience

Tuesday August 16

6:30 AM – 8:00 AM Research Subcommittee Meeting

8:00 AM – 9:30 AM Contract Administration Session

Recognition of the extraordinary achievements of C.O. Gransberg.

Moderator – Gary Angles, Section Chair, Ohio DOT

The session was called to order by Mr. Angles. He introduced the session speakers prior to their respective presentations below.

Dispute Review Boards Panel Discussion- Eric Kerness, DRBF, Ferdinand Fourie, Kiewit Corporation and David Sadler, Florida DOT,
Eric Kerness, DRBF:

- Review of the DRBF
 - History of DRB
 - Various types of construction projects and delivery methods.
 - Use of DRB on D-B projects.
 - Ohio and WV use DRBs on all D-B projects
 - Use of DRB on P3 projects. DRBF created a task force on P3s and produced white paper in 2015
 - Shared elements of successful DRB
 - Discussed typical DRB operations and how they work
 - Encourage resolution of disputes at lowest levels (job level)
 - DRB can provide formal opinions or advisory opinions by analyzing contract documents and the facts and circumstances.
 - Costs: less than 0.1% of the contract
 - Listed the primary benefits of the DRB
 - Current resolution rate: 85-98% (do not go to arbitration)
 - Florida DOT, WMATA and CalTrans have seen tangible benefits
 - Challenges listed:
 - Lack of training
 - Roles/responsibilities not clearly defined
 - Use of Ad hoc boards prevents dispute avoidance
 - Listed new DRBF initiatives

Ferdinand Fourie- Kiewit Corporation, Division Contract Administration Sponsor

- Speaking on the advantages of DRBs in Alternative Delivery Methods from a contractor's perspective
- Understanding the risk
- Alternative Delivery Models
- Nature of construction contract- complete, final, accurate, constructible
- Realities of construction
 - Always changes
 - Claims are complex and involve large sums of money
- Preferred role of lawyers in the dispute resolution process
- Major areas of dispute

- States and contractors choose the DRB members
- DRB is not there to fix errors, merely to point them out
- Why is the process successful? Open communication
- Summary
 - Understand the shift in stakeholders flexibility/risk
 - Alternative delivery methods increases complexity of communication and dispute avoidance/resolution
 - A properly chosen DRB panel has proven to be one of the best means to bring projects in within time and budget

David Sadler, Florida DOT

- Discussion of Florida's use of DRBs
- Use project specific DRBs on contracts over \$15 million
- Regional DRBs are used on those without project specific DRBs
- Have been used on more than 800 projects. Hearings held on 250 projects, less than 400 hearings. 60 recommendations rejected, half of which are from 3 projects
- \$24.5 billion in construction
- 0.08% of construction cost
- Training- To become a DRB member, one must take the training and have necessary construction experience
 - Don't allow full time consultants and contractors to be members
- Regional DRBs are established as a pool of five members
 - FTBA and FDOT State Construction Engineer decide on 3-member board
- Statewide DRBs have been seldom used
- Recommendations are almost 50/50, state/contractor
- Contractor is mostly in favor. Have a few issues.

Q: CA- best practices for why a candidate is rejected?

A: Give a reason to why they are rejected.

Q: Is there a formal partnering program in FL?

A: Yes, formal partnering with DRB for disputes. Partnering can take too much time. Not all jobs have formal partnering.

Q: Regional DRB- when are they used?

A: Only on contracts that do not have project specific DRBs. Projects less than \$15 million.

Q: Clarify numbers for state vs contractor recommendations.

A: Industry believes that the State still rejects too many recommendations. Typically rejected on issues outside of the contract.

Q: How to ensure DRBs stop acting like an owner.

A: This is a concern for DRBF are trying to emphasize this in training. Owners typically do not continue to choose this member. DRBF will have a list of recommended practitioners. Owners have the ability to remove the members. DRBF has the ability to remove the certifications of practitioners.

Q: Has the DRB eliminated claims process?

A: No.

Q: Has the DRB process impacted standard contracts?

A: Trends are evaluated and remedied statewide.

Quantification of Costs/Benefits of Alternative Contracting Methods- Moderated by Richard Duval, FHWA, Keith Molenaar, University of Colorado

- Basic breakdown of traditional methods vs. ACMs
- Breakdown of research objectives
 - Benefits of ACM
 - Quantify costs, schedule and quality consequences
 - Update Project Delivery Selection Matrix
 - Provide best practices
 - Deliverables
- Project intensity- seeing CM/GC projects are the highest \$dollars\$/day
- FHWA tech brief
- Two-step process
 - Contract admin database
 - Project Manager Questionnaires
- D-B-B, D-B-Low Bid, D-B-Best Value, CMGC
- CMGC used on the most complex projects
- Project duration: Design to construction completion
- Low dollar projects were typically using D-B-B and D-B/Low Bid contract methods
- White paper includes early work package best practices for CM/GC projects
- Project Award Growth (comparison to Engineer' Estimate): negative for DBB and DB, positive for CMGC.
- Relationships between ACMs and Change Orders
- Project Delivery Selection Matrix

- Q: Is the Project Award Growth for CMGC impacted by the CMGC cost estimating process?
- A: Not what we believe.
- Q: As construction cost vs. engineer's estimate vs. low bid discussion?
- A: Do have the data to show this and will be in final white papers.

9:45 AM – 10:00 AM Break

At this point, a 15 minute break was taken.

10:00 AM – 11:30 AM Contract Administration Session
(Continued)

ID/IQ Job Order Contracting- Moderated by Sue Eiseman, Kansas DOT

Tom Ravn, Minnesota DOT, David Sadler, Florida DOT, and Charles Nemfakos, Montana DOT

- Tom Ravn, Minnesota DOT
 - Why do they use it?
 - Multiple contracts of similar scope in close proximity
 - Finished to date
 - 50 contracts
 - Over 100 task orders
 - Types of work
 - Advantages and Disadvantages of ID/IQ
 - Funding/Groups

- Task Orders and Typical Package Submittal
- Acceptance of Task Orders is
- Lessons Learned
- David Sadler, Florida DOT
 - Use in Florida
 - How it is used
 - Types of Work Used
 - Pros and Cons of Use
- Charles Nemfakos, Montana DOT
 - Why does Montana DOT use it?
 - First Projects
 - Key Elements
 - Challenges
 - Moving Forward

Q: Average price per ADA ramp for construction and design?

A: Don't have the data currently

Q: Any pushback from contracting community?

A: No. The defined scope limits the risk to the contractors.

Q: QBS selection?

A: MT & MN- Low bid, DB- Best value selection

Q: Trouble meeting ADA compliance?

A: FL- State standards are met by contractors. Do typically have some issue meeting ADA requirements with retrofitting, etc.

New Mexico DOT Performance Based Contractor Prequalification and Procurement

Moderated by Jerry Yakowenko,

Armando M. Armendariz, P.E., Division Director, New Mexico DOT

Brian Deery, AGC

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- NMDOT
 - Development was done by group including general council, OIG, Districts and NM DOT
 - Contractors must be prequalified to work with NM DOT
 - Laws were written in NM to use this prequalification method
 - Equation, Score and Example
 - Projects of \$5 million or higher
 - Performance Factors and Percentages
 - Factors
 - LDs- measurement of the contractor's timely completion of the project
 - Claims- whether a claim was made on the project, elevated past the cabinet secretary level and is unsuccessful,
 - Non-conformances- measurement of non-conformances, NM holds up to 25% of an estimate

- Safety- performance factor for safety provided by the bonding agency, criteria measured outside of NMDOT
 - Disincentive- measurement of the assessment of disincentives for various items
 - Subcontractor- measurement of the prompt payment of subcontractors
- NMDOT & AGC Meetings
 - Consistency and transparency
- SEP-14
 - Currently in the first of two, three-year evaluations
- Conclusion
 - NM finds this process reduces the subjectivity in existing process of contractor
 - Superior product and lower burden on the taxpayer.
- Brian Deery, AGC's View of PBCP
 - The PBCP should be, as the names implies, prequalification. It should not be part of the bidding process. To do so is unfair to the contracting community, invites bid protests and litigation, can reduce competition, and can lead to manipulation of the bidding process.
 - The elements that are picked to determine the prequalification must be carefully selected and should be elements that are truly within the control of the contractor.
 - A PBCP must clearly spell out what elements are going to be judged and how they are going to be evaluated. It must be transparent and easy to understand.
 - There must be an opportunity for the contractor to correct performance deficiencies before they are included in the prequalification rating.
 - There must also be an opportunity for the contractor to work off past bad ratings. Perhaps a probationary status or some other process.
 - Last year the AASHTO-AGC-ARTBA Joint Committee discussed New Mexico's PBCP system at all four AASHTO regional meetings. There was universal concern expressed by contractors around the country. The biggest concern was making this part of the bidding process. There was also concern about some of the evaluation factors included that were considered to not be fair to the contracting community. The claims, liquidated damages and subcontractor payment factors in particular were questioned.
 - AGC of America is willing to work with AASHTO to come up with a model PBCP if that is desired.

Q: Consideration given to contractor's reason for missing prompt payment?

A: If good cause exists, prompt payment factor will not be impacted.

Q: Distinction for pass-through claims?

A: In NM, pass-through claims are considered prime claims.

Q: Does the score reflect outcome of litigation?

A: Project must be closed prior to impact on score.

Q: Are liquidated damages treated similarly to claim disagreements?

A: Performance measures are not documented until project closure.

Q: Is there more contesting of LDs?

A: More proactive approach to schedule review by the contractors. State construction

Q: Contractors may be unwilling to bid jobs because they believe it cannot be built within time allowance.

A: Contract time set during advertising in NM. Contractor can question the time allowed during bidding.

Q: When will NMDOT's evaluation of the program be available for AASHTO and AGC to review?

A: Data is open for others to review. Quarterly and annual reports are available online on the SEP-14 website. [HYPERLINK](#)

Q: Successful bidders could have higher bids, is this something that NMDOT is okay with?

A: NMDOT finds that overall; the benefits outweigh the higher bids.

Q: Is there a max or min of performance factors at the beginning of the advertisement.

A: NMDOT has a floor of 0.9. There is no ceiling. Projects less than \$5million do not use the performance factor.

Q: How many contractors were involved in the \$45 million in claims?

A: No exact number at the moment. More than 1-2. Ballpark number: 6-12 contractors.

Q: Primary driver of the change?

A: Push from Governor, update of prequalification process

Q: How are the contractors responding to the new system?

A: NMDOT sees more communication with the contractors. AGC would still not see this system. The largest impact is in the bidding system. The contractors are being more selective of the projects they are bidding on (projects without disincentives).

Q: Are the contractor's score published? Ontario publishes industry average.

A: Yes, every January. Do not know who is bidding.

Q: Are only contractors with a score allowed to bid?

A: Contractors with no data have a 1.0. Everyone is allowed to bid based on bonding capacity.

Comment: Score is published online every month for each qualified contractor.

11:30 AM – 11:45 AM AASHTOWARE Update

Jim Johnson, AASHTO

- Web-based software will be released September 2016
 - Software driven by state agencies
- AASHTOWARE Project 3.1
 - All functional areas operate off of the same core database.
 - All functional areas are released at the same time.
 - CO, FL, GA, KY, MN, MT have beta tested this software
 - Hosting system for state's data. Converting data from older software.
 - Mobile applications are also being released. Field Inspector and Field Interviewer.

11:45 PM – 12:00 PM SOC Chair Discussion Topics

Moderator – Malcolm Dougherty, Subcommittee Chair, CalTrans

At this point, Mr. Dougherty opened up the meeting for some Chair Discussion Topics. The following topics were presented:

- NMDOT Performance Based Specs Discussion

- AASHTO, ARTBA, AGC
 - Partnering revisited
 - Considering Risk allocation among parties
 - Promoting positive messages of the construction projects
 - Implementing the use of open-data
- Alternative Contracting Methods
 - Different methods necessitate different approaches
- Workforce Development
 - What will our workforce look like into the future?
 - Recruitment and retention of a younger workforce.
- Safety
 - Construction zone safety is paramount for workers and customers.
 - Behavioral safety

Q: How do you see SOC playing a role in the white papers between AASHTO, ARTBA and AGC?

A: These papers were developed to spark a conversation between groups.

12:00 PM – 1:30 PM Lunch

1:30 PM – 3:00 PM Roadways & Structures Session

Moderator – Marc Mastronardi, Section Chair, Georgia DOT

The session was called to order by Mr. Mastronardi. He introduced the session speakers prior to their respective presentations below.

We Built a Bridge in a Weekend: Deep Creek Canyon Structures- Jim Scoles, P.E., Chief Bridge Engineer, Morrison-Maierie

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Discussion of the Deep Creek Canyon Accelerated Bridge Construction
- Discussion of construction options and why ABC was used
- Final Design
 - Modular system with drilled shafts
- Challenges
 - Drilled shaft connection during closure.
 - Timing of the construction during closure.
 - Required shop dry-fit
 - Required grouting mock-up and dry run
 - Stream and environmental work
- Site constraints and staging limitations
- Lessons Learned
 - Early Public Involvement Key
 - Tough on MDT and contractor employees
 - Increased coordination with contractor, fabricator, designer and MDT
 - Traffic control communication and signage.

ABC, The lessons learned from the FHWA/AASHTO R04 Project– Finn Hubbard, P.E., Fish and Associates

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Goals for ABC
 - Enhanced mobility
 - Safety
 - Reduced Costs
- Eight test projects through SHRP2 R04
- Lessons learned
- Reasons to consider ABC
- Contracting methods used for ABC
 - DBB, DB, CMGC, A+B
 - SHRP Innovative Bridge Designs for Rapid Renewal Toolkit

Thermal Integrity Testing of Foundations– Juan Castellanos, Florida DOT

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- The testing and use of thermal integrity testing (effective temperature radius)
- Advantages and disadvantages of other options:
 - Cross Sonic Logging (CSL) testing- wave speed reduction
 - Gamma-Gamma Logging- gamma counts
- Advantages and disadvantages to thermal integrity testing
- Optimum testing concepts and methods for thermal integrity testing
- Levels of analysis of the thermal integrity testing
- FDOT use of CSL and thermal integrity testing

3:00 PM – 3:15 PM Break

At this point, a 15 minute break was taken.

3:15 PM – 4:45 PM Roadways & Structures Session (Continued)

ADA Requirements When Roads are Resurfaced – Jeff Lewis, FHWA

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Background and History of Americans with Disabilities Act
- Background of ADA history with FHWA and Department of Justice
- Definition of alteration vs. maintenance
- Obligations of the state
- Construction Obligations, Work Zones and Pedestrians
- ADAAG and PROWAG Standards
- Accessibility Requirements in the Public Right-of-way

- Design Phase Review
- Constructability Review
- Contacts and Training

Comment: Please provide presentation to Subcommittee on Design.

Comment: FHWA can provide 2-4 hour ADA training to State offices in person or via webinar.

Comment: FHWA will be publishing online ADA videos for best practices.

Alaskan Way Viaduct Bored Tunnel Update –Chris Christopher and Mark Gaines, Washington State DOT

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Overview of the entire project. Tunnel plus the portals/access areas at the approaches
- History of the existing viaduct
- All projects combined total \$3.1 billion
- Shutdown due to Tunnel Boring Machine breakdown
- Changes to the project because of the shutdown
- Construction phasing

Q: Any intermediate exhaust stacks?

A: No. Only at the ends. Jet fans are used to disperse air.

Q: Height and weight restrictions?

A: No, only to hazardous materials.

Superior Traffic Services- Portable Traffic Services with Real-Time Traffic Management- Jeff Hollenback, Jonathan Walther, Mike Superior Traffic Signals

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Company History
- Real time traffic management system
- Device Review
- Live Product Demonstration with real time look at projects from Idaho

Q: How much wind can the truss withstand?

A: 90mph wind load

5:15 PM ADJOURN

The meeting was adjourned for the day by Mr. Hoyne at 5:15 pm.

Wednesday, August 17

8:00 AM – 9:00 AM Research Subcommittee Session

Moderator – Charlie Bauer, Section Chair, Wyoming DOT

The session was called to order by Mr. Bauer. He introduced the speakers during the session prior to their respective presentations below.

Update on Current and Upcoming Research – Dr. Douglas Gransberg & Dr. David Jeong, Iowa State University

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Short review of active NCHRP Projects
- Discussion of Construction Research Past, Present and Future
- Importance of exploiting and leveraging the massive amount of data we are currently collecting

David Jeong, Iowa State University

- Research needs discussion about what the industry needs
- Lifecycle discussion of Data → Information → Decision
 - Currently there is a shortage of data analysts
- Deep data analytics of unit price data- bid tabulation data and GIS spatial analysis
 - Unit price trend analysis and heat map
- Deep data analytics of daily work report data
 - ABSS As-built schedule development system- prototype
 - Use as a project control toll
 - Use to build future schedules
- Guide to Digital Data Workflows
 - Development of process maps (signs, culverts, etc.)
- Migration from analog to Digital data project delivery

Q: How difficult is it to produce heat maps for unit prices?

A: Not very. Only need bid tabs or site manager historic information and project coordinates. Very flexible with what data is used.

Q: How can big data be used to make more informed decisions on bid data?

A: Very flexible tool to inform bidders so that reasonable unit prices are given. Might be able to drive down prices because of the realistic look at the unit prices.

Q: Please expand on how it can be used for risk based inspection.

A: Can use tools to track where and when materials have failed, or when production rates are high and when the contractor is moving at full production (higher risk for issues).

Comment: This can be applied to a single contractor's production rate to look into future schedule.

Comment: Contracting community is competitive and could be used to raise expectations.

Comment: Sharing production data of contractor may not be considered public information.

Comment: Change order data can be used for risk based inspection or update in design.

Comment: The ABSS adds a lot of value to have real time unit price and

Comment: Can be used for risk based inspection

Comment: Can be used for moving asphalt inspection crews.

9:00 AM – 9:30 AM Integrated Construction and Technologies Session

Moderator – Greg Mulder, Section Chair, Iowa DOT

The session was called to order by Mr. Mulder. He introduced the speakers during the session prior to their respective presentations below.

e-Construction Update from EDC-3 – Bryan Cawley, FHWA

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Definition of e-Construction
 - Managing projects from a paperless environment
- FL DOT has produced an e-construction How-To Guide
- Peer to Peer Exchanges are available to all states
- Webinars are available to all states
- Regional Workshops are being hosted and funding is available for state attendees
- Use of e-Construction within FHWA
 - Tablets and enterprise data system
- EDC-4: e-Construction and Partnering: A Vision for the Future
 - e-Construction and construction partnering will be pushed out as an innovation during EDC-4
 - Pavement Preservation and best practices will also be an EDC-4 Innovation
- Unmanned Aerial Vehicle (UAV)
 - FHWA has developed a strategic implementation team to review the use of UAVs

Addressing the Challenges and the Return on Investment for Paperless Project Delivery – Jagannath Mallela, Parsons-Brinkerhoff

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Background
 - Project focused on the bidding process through project closeout
- Approach
 - Business case approach
- Improvement Opportunities
 - Discussion of improvement opportunities throughout the project development and delivery process
- Feasibility Criteria
 - Quantitative benefits and costs were used for the Return on Investment Calculations
- Discussion of the benefits and cost examples of e-construction
- Business Case template/framework
- Findings summary
 - 7-year ROI & Breakeven

9:30 AM – 9:45 AM Break

At this point, a 15 minute break was taken.

9:45 AM – 11:45 AM Computers & Technology Session (Continued)**Electronic Payrolls/Civil Rights Software** – Charlie Groshens, Minnesota DOT

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings web page to view presentation](#)):

- Benefits
 - Allows for the electronic filing of contractor payrolls and subcontractor payments; instant confirmation
- Additional Functionality
 - Issue and resolution tracking
 - External Access- sub-contractors and trucking report
 - Field Interviewer Mobile App
- History of payroll systems in MnDOT
- History of implementation of system rollout
- MnDOT Support Model
 - Discussion of various levels of the implementation and support team
 - Labor compliance questions drastically outweighed IT questions
- Implementation of system
 - St. Croix Bridge Crossing Project
 - All MnDOT contracts advertised after July 1, 2013
- Contractor Access
- Vendors
- Payroll Entry and Payrolls
 - MnDOT has been paperless for three years
 - Workflows
 - Payrolls imported since July 2013- 35,297
 - Data very valuable for discussions with state legislators
- Post-implementation Process
- Key Points
 - Business staff must drive this, not IT

Q: How secure is the MnDOT website for contractors?

A: Yes, very secure.

Q: Can this be converted to a national program?

A: Starting with a regional program would be a good idea. Currently, this is an AASHTOWare product.

Q: How large is the staff that manages this program?

A: 3 people on the support lines. 2.5 IT staff. 1 civil rights employee. Construction office does payrolls.

Unmanned Aerial System (UAS) Usage – Jagannath Mallela, Parsons-Brinkerhoff

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings web page to view presentation](#)):

- Systems are a way of delivering data to the user.
- Currently there is a large spectrum of geomatics technologies
- Lidar can be used with UAS

- Study Outline
 - Review of current practices
 - Interim report
 - Project Report
 - Dissemination
- Components of UAS
 - Navigation, unmanned aircraft, data link, payload, ground control station, human operators
- Types and Advantages of UAS
 - Fixed-wing gliders, helicopters, multicopters
 - Payload imagery- thermal, RGB, Structure from Motion (SfM), point cloud
- Benefits for highway applications
 - Reduces physical presence, increasing safety and construction impedance
 - Economical. Cheaper than manned aircraft
- Limitations
 - Limited flight endurance times
- FAA Regulations
 - New rules released June 21, 2016; effective August 29, 2016
 - Widely regarded as progressive regulations for the construction industry
- Key Findings
 - Most use in structure inspections
 - Total mapping will become a big area of use for asset management and design
 - Construction- progress mapping
 - Key uses: Monitoring progress of site and risk mitigation, earthwork calculations, inspection and verification, 3D as-built records
- State of the practice
- Factors Driving Technology Adoption
- ROI Framework
 - Anticipate publishing findings in March 2017
 - Case studies in Alabama and Oregon and with a construction contractor
 - Contractors are buying a UAS for around \$50k and seeing it paid for in less than one year

Comment: UAV currently being used for mapping and site monitoring.

Comment: New FAA regulations allow for using small UAS without the application for an FAA permit.

Camera Augmented Inspection- Josh Van Jura, Project Controls Engineer, Utah DOT

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Overview of UDOT- facts and figures
- Primary Needs/Benefits
 - Inspection augmentation, not inspection
 - Ability to get second pair of eyes quickly
 - Ability to be a second pair of eyes quickly
 - Easily document contractor activities
 - Documentation
 - Safety and Security
 - Visual verification of field logs
- Capabilities and needs in order to implement
- Construction Cameras Procurement and Cost

- June 2015 with 5 cameras
- User Management
 - System requires a password
 - Appropriate use agreements were developed
 - Project staff access only
 - AGC had concerns about data being leaked to competitors
- Summary
 - Inspection augmentation
 - Ease of use
 - Big brother concerns
 - Other uses with maintenance during winter for roadway information

Q: Any public records requests for the photo data?

A: Not at this time. But we will supply the information if requested.

Tomorrow is Here: The Future of Building Things- George White, Pavia Systems, Dean Bowman, Bentley and Kevin Halter, PlanGrid

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- George White, Pavia Systems
 - Trends shaping future needs
 - Managing Risk through Asset Life
 - Life cycle analysis
 - Opportunities to Evolve
 - Opportunity to connect silos
 - Benefits when using technology
- Dean Bowman , Bentley
 - Roadblocks to
 - Passing information between areas
 - Construction Modeling
 - Information mobility and Data Flow
 - Benefits to the industry
- Kevin Halter, PlanGrid
 - See most of the growth in construction is in transportation and social infrastructure projects
 - Megaprojects
 - 12% of projects
 - 77% of funding
 - Typically overrun, schedule delay and 80% cost increase
 - \$9B rework cost due to outdated documents
 - See productivity stagnant with construction
 - Reasons for poor productivity
 - PlanGrid brings construction plans into workable format for mobile devices
 - Want to increase labor productivity, eliminate paper and prevent rework
 - Clients see an average of ROI over 2,000%

Comment: Ease of use is critical. Technology is end user focused now.

Q: How is PlanGrid used compared to typical full sized plans.

A: PlanGrid allows for the ability to search plans.

11:45 AM – 12:15 PM Lunch

Box Lunches (to go) were provided to attendees.

12:15 PM – 5:00 PM Technical Tours:

The following Technical Tours were available for interested attendees that had registered:

- Quake Lake Tour
- Lone Peak Tram Tour

5:00 PM ADJOURN

The meeting adjourned for the day at 5:00pm.

Thursday August 18

8:00 AM – 9:30 AM Safety, Environmental and Workforce Development Section

Moderator – Rob Wight, Section Chair, Utah DOT

The session was called to order by Mr. Wight. Mr. Wright then introduced the speakers during the session prior to their respective presentations below.

Intelligent Work Zones for Driver and Worker Safety, Josh Van Jura, Project Controls Engineer, Utah DOT (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Where Utah is doing currently and where they are going
- Discussion of the roads in Utah and 60% of the roads are 60MPH or higher
- Goal of Utah: Improve safety within construction work zones through significant reduction in traveler speed within boundary of active work space.
 - Perception for the need of a reduced speed is critically important
 - Speed Harmonization
- Candidate Projects
 - 4 lane divided/undivided roads
 - High Speeds (50 mph +)
 - Simple geometries
 - Resurfacing, deck replacement, patching
- Regulatory Enforcement
 - Work with highway patrol
 - System logs speed changes
 - Documentation location of device
 - Note tested in court at this time
- Success Stories
 - US 40 Deck Replacement
 - Original Posted Speed- 65mph, reduced speed-45
 - Average actual speed 51.4 mph
- Where is UDOT going?
 - Want a complete system.
 - Portable, Intelligent and Dynamic
 - Multiple Devices (PVSL, Detectors, PVMS)
- Used an FHWA AID grant for PVSL system
 - Discussion of goals, objectives and performance measures
 - Various Operational Scenarios
 - Systems Engineering and VSL Subsystem Algorithm
 - Plan to have the system automate itself after the first few projects are successful
 - Use variable speed limits sign
 - Technologies
 - Portable VSL (PVSL) Signs
 - Portable variable message sign (PVMS)
 - Portable Operator Control Device
 - Laptop, tablet, cell phone- need internet access
 - Detectors

- K-Band Doppler Speed Radar
 - Communications
 - Internet
 - Power
 - Solar panel system with 7-day batteries
- Next steps
 - Testing and verification
 - System validation
 - Refinement of system parameters
 - Repeat validation steps for 3 more projects

Q: The text messages are generated by the systems?

A: Yes.

Q: What type of security do you have on the system?

A: Password protected website. Two UDOT employees are administrators with full functionality. People on site can only choose from a library of messages.

Work Zone Intrusion Protection- AWARE System Update, Lee Cole, Director of Safety and Health, Oldcastle Materials, Kurt Davidson, Director of AWARE Technology, Oldcastle Materials (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Update presentation from the 2015 Arkansas SOC Meeting
- AWARE- Advanced Warning and Risk Evasion
- Have published “Best practices for mitigating the effects of work zone intrusions”
- Sensors, wearable and mountable GPS units, threat deterrent unit, base station application
 - Speed and trajectory detection
 - Work Trax unit is worn by employees on site. Location of employees can be monitored
- Used for mobile operations, multi-lane highways, flagger operations, lone worker scenarios
- The system is not to replace best practices, only compliment them
- Update & Next Steps
 - Tested on pilot projects in 8 different states with 13 different crews
 - 3 party testing performed by Texas A&M Transportation Institute
 - Favorable results
 - Focus on usability improvements
 - Broader internal rollout
 - Developing cost

Q: Final report out yet?

A: Initial report on lighting can be accessed. Second round of testing of false alarms is currently ongoing.

Q: How did you use the equipment on NY Throughway?

A: Currently, Oldcastle is doing pilots at own costs.

Q: At what point during a project, is the system operational?

A: Foreman and GPS system lays out the system. System also creates a heat map and is a self-learning system within 5 cars. Currently not addressing setting up and breaking down MOT.

Q: How can AASHTO and the SOC help this system?

A: Continuing to have open forums and to provide updates on the system. The system will be able to expand to other areas of the work site (other than paving).

Q: Will you be posting this information to the AASHTO site?

A: Dependent on lawyers and will continue to release more information.

Q: When trials are finished, will there be more pilots in other states?

A: That is the plan for Oldcastle.

Q: Have you considered using separate identifiers that can be used for vehicles that are supposed to be on the site.

A: Have considered this. The roll out for this is difficult because of the volume and variety of vehicles that could be entering the work zone.

Q: Thoughts on rolling system out to other contractors and how states should implement?

A: Roll out is unknown currently.

9:30 AM – 9:45 AM Break

At this point, a 15 minute break was taken.

09:30 AM – 12:00PM Safety, Environmental and Workforce Development Section (Continued)

Evaluating Storm water Controls for SWPPP – Wesley Zech, PhD, Auburn University

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Research Motivation
 - Reduce environmental impact
 - Social Responsibility
 - Economics
- SWPPP Overview
- Primary missions
 - Education
 - Product evaluation
 - Training
- Runoff Control Practices
 - Check dam/Ditch check practices
 - Effective Designs
- Inlet protection processes
- Sediment Basin Testing
- Auburn Training and Outreach
- Classroom and field components

Q: Have the Alabama standards been updated?

A: Ditch check has been updated. Inlet protection updates are happening now.

Unique Challenges to Construction in the Nation's Capital – Paul Hoffman, District of Columbia DOT

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- About DDOT
 - History
 - By the numbers

- DDOT Mission
- Safety in DDOT
 - Always a work in progress
 - Lunch and learns have been very successful
- Environment
 - Green Infrastructure
 - Green Alleys, LID Retrofits, RiverSmart Washington, GI Standards
 - Stormwater Regulation- New permits 2013
 - Land disturbance trigger- 5000 SF
 - Maximum Extent Practicable (MEP)
 - A valid attempt to use all available space to manage stormwater
 - Quality control is difficult
 - DDOT Urban Forestry Administration
 - 20 Arborists
 - 150,000 Street Trees
 - 12-15k of service requests a year
 - Use of structural soils with urban trees
 - Use Flexipave with urban trees

Q: What is done during the service calls?

A: Trimming, downed branch removal

Q: How do you find funding for maintenance of green infrastructure/trees?

A: Use federal share, not all locally funded.

Comment: DDOT administers its own Federal Projects.

Panel Discussion on Training– Darby Clayton, West Virginia DOT, Mark Chaput, Michigan DOT, Chip Hollis, Director of Communication, NICET, Robert Lutz, AMRL

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

Chip Hollis, NICET

- Developing a Qualified Workforce
 - Why develop a qualified workforce?
 - Various credentialing terms and their differences
 - Transportation Construction Inspection Programs
 - Certification Program Development
 - Looking for interested parties, particularly from mid-western and western states.

Q: NICET is eliminating the survey progression. How would surveyors get certifications now?

A: Current certifications will be able to be recertified. Could be rolled into new programs.

Robert Lutz, AMRL

- Main function is laboratory accreditation
 - 1,000 assessments a year
- Hosting training and working with FHWA highway materials training course
- Inspector Training
- National Training and Certification
 - Good model for AASHTO group

- Northeast Transportation Training Certification Program (NETTCP)
 - Very successful on laboratory technician side
 - Two days of laboratory and inspector training

Q: Does your agency require inspector certification?

A: Over 50% of the respondents require certification for internal and consultant inspectors.

WV- Internal certifications for inspectors (internal and consultant) and materials testers.

MI- No formal certification program. Do federal certifications for sampling and testing. Currently identifying training possibilities. Plan to formalize in the future.

Q: What do you think an inspector certification should include?

A: Majority (~80%) of the respondents responded with training, written exam and hands-on testing.

Q: Which best describes your agency's inspector training program?

A: Majority (~85%) responded with a combination of classroom/online training, hands-on and informal training.

MI- Prefer the combination of classroom and hands-on. The NHI and TC3 tools have been very helpful. Most inspectors are generalists and no longer have specialists (i.e. bridge inspector), which can be difficult.

WV- Very similar to MI. Utilize web-based trainings as much as possible.

Q: How do you measure the effectiveness of your agency's inspector training program?

A: Majority of the respondents (~60%) use a combination of written exams, peer review or oral exams, hands on performance testing and supervisor approval.

Q: Does your agency have a formal mentoring program?

A: Majority of the respondents (~90%) responded no.

WV: No formal program, but trying to pair younger inspectors with experienced inspectors.

UT: Not enough experienced inspectors to pass on knowledge. And want to formalize a program in Utah.

ME: Has a formal process. Pairing younger employees with high potential for management with experienced, senior inspectors.

TX: Used to have a program, but it is currently in disrepair.

VT: Have developed a new employee handbook with a roadmap of what employees should accomplish in the first two years. The handbook gets into policy and procedures, as well as technical requirements.

Q: What are your agency's biggest challenges to developing competent construction inspectors?

A: Majority of respondents (~65%) find the inability to compete to hire suitable raw talent.

MI: Starting to raise entry-level pay rates to compete with consultants. Competing to retain existing employees.

Transportation Curriculum Coordination Council (TC3) Update – Darby Clayton, West Virginia DOT

The presentation addressed the following topics (See [AASHTO SOC Annual Meetings](#) web page to view presentation):

- Mission is to serve transportation community
- Vision is to be a resource to the state
 - A lot of web-based trainings
- Volunteer structure

- Partnering on new products

12:00 PM – 1:15 PM Lunch

1:15 PM – 3:00 PM Section Group Meetings

3:00 PM – 3:15 PM Break

At this point, a 15 minute break was taken.

3:15 PM – 4:45 PM Closing Session – SOC Business Meeting

Section Chair Reports

Mr. Hoyne called the meeting to order at 3:15 pm. Each of the Section Chairs provided a summary report for their respective Section as described below. NOTE: Section Meeting minutes are contained in Appendices F, G, H and I these minutes.

Contract Administration: Gary Angles (Ohio DOT)

Roadways and Structures: Marc Mastronardi (Georgia DOT)

Safety, Environmental and Workforce Development: Rob Wight (Utah DOT)

Integrated Construction and Technologies: Greg Mulder (IA DOT)

SOC Meeting Summary by George Raymond (OK DOT) – Mr. Raymond provided the attendees an entertaining summary of the meeting using the various acronyms that occurred in the presentations during the week. Says it was the best meeting he has been to and he has been to 18!

2017 SOC Host State Presentation – Cincinnati, OH
Video presentation on what to expect when in Ohio next year

2019 SOC Host State Selection

Florida Presentation of Tampa by David Sadler
 Tennessee Presentation of Nashville by Will Reid

Nashville, TN wins with a vote of 18 to 16.

5:00 PM ADJOURN

The meeting was adjourned by Mr. Hoyne at 5:00pm.

APPENDICES

Appendix A - AASHTO SOC Officers, 2016-2017

Appendix B - Meeting Attendees List

Appendix C - State Discussion Topic Responses

Appendix D - State Discussion Topic Responses- California

Appendix E - State Discussion Topic Responses- Oklahoma

Appendix F - Contract Administration Section Report

Appendix G - Roadways and Structures Section Report

Appendix H - Integrated Construction and Technologies Section Report

Appendix I - Safety, Environmental and Workforce Development Section Report

Appendix J - Research Steering Committee Report

Appendix K - SOC Resolutions

Appendix A

AASHTO SOC Officers 2017

AASHTO Subcommittee on Construction Officers 2017

Administration	Chair	Vice Chair	Vice Chair-Elect	Secretary
Administration	Malcolm Dougherty, CalTrans malcolm.dougherty@dot.ca.gov 916-654-6130	David Hoyne, VTTrans David.Hoyne@vermont.gov 802-828-2593		Rob Elliott, FHWA Rob.Elliott@dot.gov 404-562-3941 Matthew DiGiovanni, FHWA (Asst. Secretary) Matthew.DiGiovanni@dot.gov 802-224-1368

Sections	Chair	Vice Chair(s)		Secretary
Integrated Construction and Technologies	Joe Squire, Oregon DOT Joe.Squire@odot.state.or.us 503-986-3123			John Haynes, FHWA John.Haynes@dot.gov 801-955-3526
Contract Administration	Gary Angles, Ohio DOT Gary.angles@dot.state.oh.us 614-466-7057	Andy Long, WY DOT andy.long@wyo.gov 307-777-4425	Susan Eiseman, KS DOT susan.eiseman@ksdot.org 785-250-7839	Jerry Yakowenko, FHWA Gerald.Yakowenko@dot.gov 202-366-1562
Safety, Environment and Workforce Development	Rob Wight, Utah DOT rwight@utah.gov 801-633-6252	Tracy Cain, TxDot Tracy.cain@txdot.gov 512-416-2559		Jeff Lewis, FHWA Jeff.Lewis@dot.gov 916-498-5035
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Research Steering Committee	Charlie Bauer, Wyoming DOT charlie.bauer@wyo.gov 307-777-4927			Katherine Petros, FHWA Katherine.Petros@dot.gov 202-493-3154

AASHTO Liaison: Evan Rothblatt; (202) 624-3648; erothblatt@aaashto.org

Ohio DOT Contact - 2017 Annual Meeting: Gary Angles, State Construction Engineer (614) 466-7057; Gary.Angles@dot.state.oh.us

Appendix B

Meeting Attendees List

Last Name	First Name	Title	Company	Phone	Email Address
Adams	Bill	Owner	Hancock Concrete Products	605-335-7807	bill.adams@hancockconcrete.com
Ahlvers	David	State Construction & Materials Engineer	MoDOT	573-751-7455	david.ahlvers@modot.mo.gov
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Anderson	Devin	Engineer	Maine DOT	207-446-0428	michelle.r.toulouse@maine.gov
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Chisolm	Richard	State Construction Engineer	MS Department of Transportation	6013597301	rchisolm@mdot.ms.gov
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Appendix C

State Discussion Topic Responses

3D ENGINEERED MODELS AND AUTOMATED CONSTRUCTION

(David Unkefor – FHWA)

- Does your state have a spec and guidance documents for collecting digital as-built data? If not, are you planning to develop these and collect any digital as-built data during construction, particularly subsurface features location data?
- Describe any increased contractor use of automated inspection equipment (e.g. UAVs, Lidar) or automated heavy equipment (i.e. run/guided by GPS) and how that has worked.
- How are DOTs using 3D models and GPS equipment in construction for QA and measurement for payment? What is each state using for e-Bidding? We are looking for something out of the box (as much as possible).

(Joe Robinson – Pennsylvania DOT)

- If a contractor would use Automated Machine Guidance (AMG) on a project, what issues with the 3D model would force them to revert to manual methods?

AMERICAN DISABILITIES ACT

(Rachel Falsetti – California DOT)

- Do any States have any type of American Disabilities Act training for temporary or permanent facilities to help educate staff on proper installation? How do you ensure proper installation?

ASPHALT

(Joe Robinson – Pennsylvania DOT)

- What is the max RAP/RAS % other states are allowing in mixes?

A: RAS- AK/FL/SD/WV/NY/ND/NH/MO= 0%, TX= 1.5%, ME/AR=3%, IA/OK/KS/DC/TN/KY/OH=5%, NC=6%, NE=20%, WI=20-25%, MI=27%

A: RAP- WY/AK/NH/SD/ND/VT=20%, UT= 25%, GA/OK/AR=30%, TN=35%, CA= 15-25%, TX= 0-30%, WV= 15-25%, WI=25-40%, FL=25-45%, NE= 25-50%, ME= 20-30%, NC= 50%, OH=15-55%, IA=10-Unlimited%.

(Jeff Lewis – FHWA)

- What procedures do states use for HMA verification and the collection of certified weight tickets?

CONCRETE

(Joe Robinson – Pennsylvania DOT)

- Any best practices on sealing new concrete for longevity? Better results with hot material or with neoprene seals?

A: KS: no sealing. ME: use 100% silene sealer on all concrete. VT: Use silane on bridge decks. No concrete roads in VT. OK: Use silene on bridge decks. No concrete roads in OK. IA: Has not found sealing to work. Some states not sealing any joints.

(Jason Gutting – Michigan DOT)

- Do any states allow mid lane (or anywhere other than lane edge) pavement joints in any situation? What has been the benefits or challenges with these applications?

A: AR: Strongly avoid because of uniformity. NH: allow less than 2 inches. KS: Allow with thin concrete overlays and on ramps.

CONSTRUCTION INSPECTION

(David Sadler – Florida DOT)

- Does your state allow projects to be flown by Drones for construction inspection or progress monitoring?
- If so, does your agency have a policy for this?

CONSTRUCTION/MATERIALS ISSUES

(Joe Squire – Oregon DOT)

- With respect to Staging and Excess materials stockpile locations, how does your DOT address contractor controlled sites off right of way and address Tribal concerns for cultural resources?

A: OR: 9 recognized tribes in state. OK: Support the tribes and encourage them to attend DOT classes. MI: Work with tribes on accommodations. Work with state cultural and environmental authorities to work through all sites. Pre-bid conference with tribes.

(David Sadler – Florida DOT)

- How do states handle approvals and specifications for competing products? For example, there are several competing pipe products – how do states decide which are acceptable?

(David Henning – Arkansas DOT)

- How are asphalt hot mixes bid and paid for in your state: separately as binder and aggregate or together as mix? Are there any specific reasons for which method was chosen and are there any issues?

(We have used separate pay items in Arkansas for several decades and have recently been asked by our AGC chapter to consider payment for the ton of mix. Our neighboring states pay by the ton of mix, but we understand that some are moving to paying for the binder and aggregates separately)

A: NE/ND/AK= two bid items. IA/MT/OR/CO= separate and combined. OR- wants to avoid contractor giving state a bare minimum mix. OK: Combined for ease of documentation.

CONSTRUCTION SCHEDULING

(John Eddy – Colorado DOT)

- CPM for all types and sizes of projects? Do they have support from industry?
- What type of software is being used by state agencies to review schedules?
- Training: Do they provide training to industry?
- How do they ensure consistency across the state? What process does each state use to determine allowable work windows for construction projects?

A: AR: 2nd year of CPM spec. P6 training was available for staff. AGC offered training to contractors. Projects exceeding 100 days required CPM schedule. Used Trauner CPM analysis class. MT: Require P6 for complex projects. Hire a claim consultant to phase it in. NC: Not using CPM. Many states using Gantt charts. PA: Narrative only on smaller projects, Resource loaded schedules for larger projects. AK: CPM for all schedules. “P6 or approved equal”. Use LDs for schedule compliance (\$500/day for late submission). UT: Penalty for non-submittal for schedule. \$250/7 days late. Oracle support has been difficult. IA: Current spec is weak. Working on stronger language. VT: Accelerated bridge construction program has pushed CPM forward. ME: Use pay item (by month) for CPM schedule. SD: Worked with AGC on development. Varying requirements depending on size of the project. Industry pushing for linear scheduling software.

CONTRACT ADMINISTRATION

(Gary Angles – Ohio DOT)

- For extra work on a force account basis, labor is verified by wage rates and material costs are supported by invoice. Does every state use Blue Book Rental Rates to reimburse the contractor for equipment ownership costs and operating costs. This is published by Equipmentwatch, also known as Penton Business Media. The annual subscription costs for these rates are escalating every year. Does any state use another method to reimburse contractors for equipment costs on force account?

A: AK: Blue book or invoice rates. OK: Most states use blue book enterprise wide. FL: Equipment watch enterprise wide application or individual copies. ~\$90k/year. GA: Enterprise equipment watch. PA: Enterprise-wide but charges per use vs annually. Ontario: Internal estimates create rates. Western Fed Lands: Actual rates (if supported) or Army Corps rates. AR: Bought license for each district engineer. TN: One license per district. IA: One license per district.

(Rachel Falsetti – California DOT)

Extra Work at Force Account

- What extra work at force account billing system do other state DOT's use to track and reconcile time and material work performed by the contractor?
- Do you require the contractor to invoice the work and just pay lump sum based on the invoice?
- Do any State DOT's use any "off the shelf programs for time and material billings"?
- Do these programs include approved hourly rental rates?

Consultant Contracting

- Do you contract out work on your construction projects to consultants?
- If so, do you use standardized templates for preparing your consultant contracts?
- Would you be willing to share those templates with other DOTs?
- Can you describe the process by which consultant contracts are established for your construction projects?
- How long does this process typically take?
- Are there any notable challenges with establishing your consultant contracts (such as getting the scope of work approved, consultant disputes on your selection process/criteria, etc.)?

Prompt Payment

- Do any States have a process where they track and ensure subcontractors are being promptly paid each month for work performed (Prompt Payment)? If so, is this a State requirement or Federal? If so, what type of process or system is being used to track this information? If so, do you have an enforcement clause in your specifications?
- Do any States have a prompt pay requirement for completed extra work? How do they monitor and ensure payment to the prime and subcontractors?

A: MI: Require pass-through language in subcontracts. If prime not paying: payment held, suspension, hold LDs. AR: Mainly track DBE payments. Required language in all subcontracts. AL: Language in subcontracts. FL: Primes must certify. KS: Certification form for every pay estimate. Moving this towards civil rights use. WA: Post all contractor payments on a website. Subs can review and will get in touch with WA if not paid. DE: Monthly certification form.

Central Federal Lands Coordination

- For projects on State right of way but within Central Federal Lands jurisdiction, which specifications are used for design and contract administration? The Central Federal Land's or the State

INTELLIGENT COMPACTION**(Joe Robinson – Pennsylvania DOT)**

- Any other states requiring this on projects? Or done pilots?
- If so, to what level (e.g. Acceptance, Acceptance in combination with Nuclear Moisture/Density Gauge, QC, Mapping for uniformity and weak areas, Information only, other...)
- Any correlations between IC and density?
- If required, do you still drilling the same number of cores for testing and payment?

A: MN: Using IC with bituminous. Backed off IC with soils. VT: Using for roller patterns only.

PERFORMANCE MEASURES

(Rachel Falsetti – California DOT)

- Do you track performance measures on your construction projects?
- If so, which performance measures do you track?
- Which software program(s) do you use to track and display your performance measures?

A: CA: items being tracked include initial vs final cost, changes for items in the field, final estimates, timely payments to contractors for extra work. OR: Items being tracked include project closeout time, PE&CE costs. Plan to review contractor ratings post-project completion. GA: Material quality including steel cover in bridge decks and ride quality. TN: Budget, time, performance measures linked to employee performance plans. OK: “Top 20” oldest contracts listed. UT: Also list oldest contracts. NC: Use personnel performance plans. Environmental performance. Quality of construction plans. CT: Awards system for time it takes to issue change orders, to close out project and on time/on budget overhead award. PA: Score cards for district heads- pavement density and longitudinal joint density. VT: Tri-state performance measures with NH and ME.

WORKZONE SAFETY

(Mark Rolfe – Connecticut DOT)

- How does you state handle the installation and removal of temporary sign patterns on limited access highways with high traffic volumes? Are rolling road blocks allowed? If so, is there a time limit or portion of the sign pattern for which a rolling road block is allowed?
- Has your state experienced a shortage of State police officers available for duty on construction projects? How do you handle?

A: Most states look at the use of rolling road blocks on a per-project basis. UT: use highway patrol, county sheriffs and incident management people. MI: State police sets overtime rate. PA: Require crash trucks. NH: 2% of construction program goes to UTOs. UTO required for TTC install and setting steel. TN: Using a protect the que program.

Appendix D

State Discussion Topic Responses from California

3D ENGINEERED MODELS AND AUTOMATED CONSTRUCTION

(David Unkefor – FHWA)

- Does your state have a spec and guidance documents for collecting digital as-built data? If not, are you planning to develop these and collect any digital as-built data during construction, particularly subsurface features location data?

Chuck Suszko - No. There has been some discussion on collecting digital as-built data but we are currently concentrating on implementing automated machine guidance.

Andy Alvarado - Caltrans does not have specifications or guidance for collecting digital as-built data, but we are planning to develop this as part of an overall e-Construction and asset management strategy.

- Describe any increased contractor use of automated inspection equipment (e.g. UAVs, Lidar) or automated heavy equipment (i.e. run/guided by GPS) and how that has worked.

Andy Alvarado - There are no contractors that I know of that are currently using automated inspection equipment, although in a meeting regarding automated machine guidance, one large contractor said that his company is looking into the use of drones in the future. As for automated heavy equipment, contractors have been using automated machine guidance on their heavy equipment for several years. Their use has been generally limited to earthwork and some paving.

Suszko & Stayton - Starting in 2013, Caltrans will be and is implementing the Intelligent Compaction (IC) technology. Caltrans plans to pilot this technology on 34 hot mix asphalt projects and 28 cold in-place recycling projects. Though not all pilot projects are completed, there have been some early lessons learned. One such lesson is with the software and reports being produced. Caltrans is working closely with FHWA and Industry to change the software so only the necessary reports to ensure contract compliance are produced. Once all of the pilots are completed, the data will be evaluated and appropriate specifications will be developed to fully implement this technology.

- How are DOTs using 3D models and GPS equipment in construction for QA and measurement for payment?

Andy Alavardo - Caltrans provides a digital terrain model, roadway design alignments, cross-sections, and a digital design model. Contractors use these files to generate the files they need to upload into their heavy equipment for automated machine guidance. Caltrans is working with industry to develop a specification that provides for placement of fewer construction stakes and easier grade checking for compliance and measurement.

- What is each state using for e-Bidding?

Andy Alavardo - Caltrans uses - e-Bidding for all contracts except emergency contracts. Caltrans has been using the AASHTOWare products - Project Expedite and Bid Express -

(Joe Robinson – Pennsylvania DOT)

- If a contractor would use Automated Machine Guidance (AMG) on a project, what issues with the 3D model would force them to revert to manual methods?

Andy Alavardo - ? I don't know of any issues with the 3D model that would force the contractor to revert back to manual methods. However, one scenario where a contractor would be forced to revert back to the manual method might be where a prime contractor does all of the earthwork using AMG, and then subcontracts the Portland cement concrete paving to a subcontractor who does not have AMG capabilities on its paver. In that case, finish grade stakes will have to be provided and the contractor would likely pave using a wire.

Also, AMG equipment manufacturers use different systems for their equipment. Each manufacturer has different characteristics which may make the grade look like it is out of specification when it is not. Even if calibrated to control points, if the contractor is using one manufacturer's equipment to make the grade and the owner is using a different manufacturer's equipment to check the grade, there would/could be an introduced discrepancy in points in the field, e.g. one may show 0.03' high, while the other may show 0.03' low even if they both calibrate at the control points. If this causes the owner to reject the grade, the contractor will likely revert back to using standard stakes.

AMERICAN DISABILITIES ACT

(Rachel Falsetti – California DOT)

- Do any States have any type of American Disabilities Act training for temporary or permanent facilities to help educate staff on proper installation? How do you ensure proper installation?

Caltrans has developed ADA training for temporary facilities and a temporary facilities handbook.

Caltrans is currently updating permanent facilities training.

ASPHALT

(Joe Robinson – Pennsylvania DOT)

- What is the max RAP/RAS % other states are allowing in mixes?

Chuck Suszko - 15% asphalt binder - blending chart not required
25% asphalt binder - blending chart required

(Jeff Lewis – FHWA)

- What procedures do states use for HMA verification and the collection of certified weight tickets

Chuck Suszko - Caltrans does a job mix formula (JMF) verification for mix authorization prior to HMA paving. There is also a start-up evaluation of the HMA on the first day of HMA production. The DOT paving inspector is to collect the certified weight tickets in the field.

CONCRETE

(Joe Robinson – Pennsylvania DOT)

- Any best practices on sealing new concrete for longevity? Better results with hot material or with neoprene seals?

Chuck Suszko - Caltrans specifications allows contractors to choose silicone joint sealant, asphalt rubber joint sealant or performed compression joint seal.

CONSTRUCTION INSPECTION

(David Sadler – Florida DOT)

- Does your state allow projects to be flown by Drones for construction inspection or progress monitoring?

From Dolores Valls

I have been asked a few times if I could utilize a drone to assist with bridge inspections but we have not actually utilized one yet. We are interested though. Essentially we are waiting for the Department to publish the rules to acquire and use first.

Question by NORTH DAKOTA at AASHTO –

Are any States starting to use "Drones" to gather any data? If yes, what applications and what are major hurdles?

Caltrans has not used drones, also referred to as Unmanned Aerial Systems (UAS), to collect data on the state highway system. The Division of Aeronautics serves as the Caltrans point of contact regarding UAS information. Plans are being developed to apply for a Certificate of Waiver or Authorization (COA) from the FAA to operate a UAS in the National Airspace System for some of core activities.

http://dot.ca.gov/hq/planning/aeronaut/documents/newsletters/aero_newsletter_201502_02.pdf

Caltrans Division of Research, Innovation and System Information published a UAS Preliminary Investigation in 2014.

http://www.dot.ca.gov/newtech/researchreports/preliminary_investigations/docs/unmanned_aerial_systems_preliminary_investigation_rev8-14-14.pdf

Caltrans Office of Photogrammetry has proposed a research project titled: **“Specifications for Using Unmanned Aerial Systems to Generate High Accuracy Mapping”**. This research project will develop a proven set of specifications for small UAS (sUAS) hardware and ground control requirements for both imagery and LiDAR collection. This will enable the deployment of this technology for high accuracy mapping not only for Caltrans and other DOTs, but for any organization or company worldwide. The specifications from this research project will be the basis for a new chapter in Caltrans Surveys Manual on the integration of sUAS in the surveying workflow. The research will be conducted by the California State University, Fresno. For more information, contact John Erickson at (916) 227-7649 or john.erickson@dot.ca.gov.

- If so, does your agency have a policy for this? - [See above](#)

CONSTRUCTION/MATERIALS ISSUES

(Joe Squire – Oregon DOT)

- With respect to Staging and Excess materials stockpile locations, how does your DOT address contractor controlled sites off right of way and address Tribal concerns for cultural resources?

Shaun Ng - Response Part 1 of 2: Concerning stockpiling excess material at private property located outside the highway right of way, Caltrans specifications requires the Contractor to comply with Permits, Licenses, Agreement and Certifications and to submit a written agreement from the property owner for the use of the property. The applicable specifications are copied below and a copy of an example agreement from our Construction Manual is attached to this email

Part 1

5-1.20B Permits, Licenses, Agreements, and Certifications

5-1.20B(1) General

Comply with PLACs. The Department makes PLAC changes under section 4-1.05. Maintain a copy of each PLAC at the job site.

5-1.20B(2) Before Award

To make a change to a PLAC made available to you before award, submit the proposed change. The Department sends the proposed change to the appropriate authority for consideration.

5-1.20B(3) After Award

Confirm with the Engineer which after-award PLACs are obtained by the Department and which are obtained by the Contractor.

To make a change to an after-award PLAC obtained by the Department, submit the proposed change. The Department sends the proposed change to the appropriate authority for consideration.

Obtain those PLACs to be issued to you and pay the fees and costs associated with obtaining them. Submit copies of Contractor-obtained after-award PLACs.

5-1.20B(4) Contractor–Property Owner Agreement

Before procuring material from or disposing of material on non-highway property:

1. Submit a written agreement from the property owner:

1.1. For the use of the property

1.2. Absolving the Department from responsibility in connection with the property

2. Obtain authorization to start

Before Contract acceptance, submit a document signed by the owner of the material source or disposal site stating that the Contractor has complied with the Contractor-owner agreement.

Part 2

Response Part 2 of 2: Concerning staging areas, Section 13-1.03B of Standard Specifications lists staging areas and storage yards as “Contractor-Support Facilities” and Caltrans specifications requires the Contractor to use water pollution control practices to protect stormwater systems or receiving waters from Contractor-support facilities. Section 18-1.03A pertaining to Dust Palliatives also requires the Contractor to apply dust suppressant to staging and storage areas. Standard Specifications Sections 13-1.03B and 18-1.03A are copied below:

13-1.03B Contractor-Support Facilities (Section 13 – Water Pollution Control)

Use WPC practices to protect stormwater systems or receiving waters from the discharge of potential pollutants from any Contractor-support facility.

Contractor-support facilities include:

1. Staging areas

2. Storage yards for equipment and materials

3. Mobile operations

4. Batch plants for concrete and HMA

5. Crushing plants for rock and aggregate

6. Other facilities installed for your convenience, such as haul roads

If you obtain or dispose of material at a non-commercially operated borrow or disposal site, prevent water pollution due to erosion at the site during and after completion of your activities. Upon completion of your work, leave the site in a condition such that water will not collect or stand in it.

18-1.03 CONSTRUCTION (Section 18 – Dust Palliative)

18-1.03A General

Monitor dust conditions and apply a dust palliative for dust control as described and as ordered.

Reapply the dust palliative at any time to control dust.

Apply a dust suppressant to:

1. Temporary haul roads
2. Construction staging, material storage, and layout areas
3. Compacted soil or AB roads or driveways
4. Paved surfaces

Apply a dust control binder to:

1. Rough-graded soils
2. Completed slopes
3. Soil stockpiles unless another practice is already used

Do not use a dust suppressant or dust control binder within 100 feet of a wetland or body of water.

(David Sadler – Florida DOT)

- How do states handle approvals and specifications for competing products? For example, There're several competing pipe products – how do states decide which are acceptable?

Andy Alavardo - Caltrans tests products and/or requires manufacturers to provide testing results from an independent testing facility to determine acceptability for placement on Caltrans' approved products list. Then during design of a project, the project engineer will determine which alternatives are appropriate for the project in question. For example, suppose there are three viable culvert pipe alternatives for the application and location of the project; the project engineer would include a pay item for "Alternative Pipe Culvert" and list the three viable material alternative types in the project special provisions. The contractor could then base its bid using whichever one of these alternatives it chooses to use.

(David Henning – Arkansas DOT)

- How are asphalt hot mixes bid and paid for in your state: separately as binder and aggregate or together as mix? Are there any specific reasons for which method was chosen and are there any issues?

(We have used separate pay items in Arkansas for several decades and have recently been asked by our AGC chapter to consider payment for the ton of mix. Our neighboring states pay by the ton of mix, but we understand that some are moving to paying for the binder and aggregates separately)

Chuck Suszko - Hot mix asphalt is paid by the ton of mix. At this time, Caltrans is not aware of any issues related to this pay method.

Sri B. - In response to why we chose this method of payment, the cliché answer will be “we have always done it that way”. Personally, I know this is how we have done for the past 25 years and from what I hear even before that time. However, as with everything else, both ways of doing have their advantages and disadvantages.

We measure and pay by the mix because it is the end product that we get on the grade. It is easier to measure, verify and pay for the mix. We are measuring the final product and not the ingredients. Over a period of time it is much easier to verify visually, if we getting the amount of product that we are paying for, i.e. if we have a weigh ticket that say the truck has 25 tons and we look in the truck, people can pretty much say if it contains 25 tons or 10 tons. It is not that easy to estimate on the individual components, especially the binder. If for some reason we have to reject the material, it would be easier to determine the value of the rejected material. If we paid by the ingredients and the mix does not meet our requirements, then we would have to debate on what caused the failure and which component should we pay for and which we don't. This also puts pressure on the contractor to make sure the end product meets the specifications. For example, if the mix is rejected because of poor gradation, then they would have also wasted their binder. The disadvantage of paying by the mix is that the contractors might try to reduce or be on the lower end of the specified binder range, because they don't get paid for the binder, they get paid on the mix. If we pay for binder and aggregates separately, a contractor might try to add more binder to the mix because it is an expensive product. If you pay by the mix, you are more likely to get dry mix and if you pay by the two ingredients, you are more likely to get a rich mix.

CONSTRUCTION SCHEDULING

(John Eddy – Colorado DOT)

- CPM for all types and sizes of projects?

Andy Alavardo - Yes, but there are three levels of CPM schedule with different requirements based on the cost and complexity of the project.

Do they have support from industry? Yes – Industry supports the idea of CPMs. There was a Project Improvement Proposal (PIP) developed through the Partnering Steering Committee to alter the specification. Some level 3 projects, such as miles of AC overlay, do not need a level 3 CPM.

In addition, there was a request to accept the contract's CPM with comments/concerns/risk noted. In the past, CPM were not being accepted; therefore, a baseline schedule took months to approve.

- What type of software is being used by state agencies to review schedules?

Andy Alvarado – Mostly P6 software.

- Training: Do they provide training to industry?

Andy Alvarado – Yes.

- How do they ensure consistency across the state?

Andy Alvarado – Training and mentoring are used to ensure consistency across the state.

What process does each state use to determine allowable work windows for construction projects?

Andy Alvarado - Daily work windows are set by Caltrans Traffic Operations. They use criteria that determines traffic impacts that are incorporated into the process of developing the overall traffic management plans, which includes allowable work hours. There are other work window criteria as well season (e.g. wet season), environmental, and other constraints which affect the dates a contractor is allowed to work within certain areas.

CONTRACT ADMINISTRATION

(Gary Angles – Ohio DOT)

- For extra work on a force account basis, labor is verified by wage rates and material costs are supported by invoice. Does every state use Blue Book Rental Rates to reimburse the contractor for equipment ownership costs and operating costs. This is published by Equipment watch, also known as Penton Business Media. The annual subscription costs for these rates are escalating every year. Does any state use another method to reimburse contractors for equipment costs on force account?

Andy Alavardo - Caltrans uses its own publication entitled *Labor Surcharge and Equipment Rental Rates*. Caltrans determines the rates by totaling the direct costs of the equipment which includes fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance, depreciation, storage, cost of facilities capital, overhaul and all incidentals. The labor costs required to provide the above listed items are also included. Caltrans produces their equipment rental rate book annually.

(Rachel Falsetti – California DOT)

Extra Work at Force Account

- What extra work at force account billing system do other state DOT's use to track and reconcile time and material work performed by the contractor? Caltrans uses a system called the Contract Administration System (CAS), which well-seasoned
- Do you require the contractor to invoice the work and just pay lump sum based on the invoice? Caltrans does not
- Do any State Dot's use any "off the shelf programs for time and material billings"? Caltrans does not
- Do these programs include approved hourly rental rates? - N/A

Consultant Contracting

- Do you contract out work on your construction projects to consultants?
Ken Solak – Yes. For materials testing, inspections, claims and office engineer activities.
- If so, do you use standardized templates for preparing your consultant contracts?
Ken Solak – Yes.
- Would you be willing to share those templates with other DOTs?
Ken Solak – Yes.
- Can you describe the process by which consultant contracts are established for your construction projects?
Ken Solak - Our District construction offices work with our Division of Procurement of Contracts (DPAC) and the Department’s legal Division to develop a template called a Statement of Work (SOW). Once SOW is agreed upon the following steps are taken:
Submit SOW to DPAC
Process necessary paperwork to ensure funding is available – (ADM 360 Form)
Advertisement/Consultant SOQ Preparation
Initial Evaluation Completed by Selection Committee
Interviews conducted and Most Highly Qualified Firm Selected
Negotiate Contract Terms and Conditions
Award and Execution
- How long does this process typically take?
Ken Solak – More recently, contracts have taken longer than one year to finalize. The old process was about 90 to 120 days. Some challenges of late with the SOW has been with personnel qualification/skills. In an effort to improve, the Department did what is called a Lean 6 Sigma process evaluation, which is to reduce the overall time to 45 days. We are currently testing the new process to see if the 45 days is possible.
- Are there any notable challenges with establishing your consultant contracts (such as getting the scope of work approved, consultant disputes on your selection process/criteria, etc.)?
Ken Solak - SOW has been an issue

Prompt Payment

- Do any States have a process where they track and ensure subcontractors are being promptly paid each month for work performed (Prompt Payment)? **Caltrans does not.**
If so, is this a State requirement or Federal? **We don’t specifically track this, but we do withhold payment if a Stop Notice is filed by a subcontractor.**
If so, what type of process or system is being used to track this information? **We track the Stop Notices and provide payment once they are resolved by the prime and subcontractor.**

If so, do you have an enforcement clause in your specifications? **We just withhold the payment, although we conceivably could also do a performance failure withhold per Standard Specification Section 9-1.16E(3) Performance Failure Withholds.**

- Do any States have a prompt pay requirement for completed extra work?
Standard Specifications Section **9-1.03 PAYMENT SCOPE** states: “Pay your subcontractors within 7 days of receipt of each progress payment under Pub Contract Code §§ 10262 and 10262.5.”
For the prime contractor, Standard Specifications Section **9-1.16 PROGRESS PAYMENTS**, subsection **9-1.16A General** states:
The Department pays you based on Engineer-prepared monthly progress estimates. Each estimate reflects:
 1. Total work completed during the pay period
 2. Change order bills if:
 - 2.1. Submitted by the 15th day of a month
 - 2.2. Approved by the 20th day of a month

How do they monitor and ensure payment to the prime and subcontractors?
Caltrans tracks payments to the Contractor through its monthly pay estimates, but does not track payment to the subcontractors.

Central Federal Lands Coordination

- For projects on State right or way but within Central Federal Lands jurisdiction, which specifications are used for design and contract administration? Caltrans has had two recent dealings with Central Federal Lands. Each of them different. Each, however, required that the project would be constructed using Federal Lands Highway “Construction Manual” and The United States Department of Transportation, Federal Highway Administration, Federal Lands Highway “Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-14,” rather than the Caltrans Construction Manual and Standard Specifications.

The Central Federal Land’s or the State

INTELLIGENT COMPACTION

(Joe Robinson – Pennsylvania DOT)

- Any other states requiring this on projects? Or done pilots?
Suszko & Stayton - Starting in 2013, Caltrans will be and is implementing the Intelligent Compaction (IC) technology. Caltrans plans to pilot this technology on 34 hot mix asphalt projects and 28 cold in-place recycling projects. Though not all pilot projects are completed, there have been some early lessons learned. One such lesson is with the software and reports being produced. Caltrans is working closely with FHWA and Industry to change the software so only the necessary reports to ensure contract compliance are produced. Once all of the pilots are completed, the data will be evaluated and appropriate specifications will be developed to fully implement this technology.
- If so, to what level (e.g. Acceptance, Acceptance in combination with Nuclear Moisture/Density Gauge, QC, Mapping for uniformity and weak areas, Information only, other...)
Chuck Suszko - Caltrans considers IC to be a quality control tool. Used for method compaction to ensure number of passes and HMA is compacted above minimum temperature requirements.
- Any correlations between IC and density?
Chuck Suszko-At this time, no correlation has been identified.
- If required, do you still drilling the same number of cores for testing and payment?
Chuck Suszko-Yes.

PERFORMANCE MEASURES

(Rachel Falsetti – California DOT)

- Do you track performance measures on your construction projects?
Ken Solak – Yes.
- If so, which performance measures do you track?
Ken Solak - Safety, capitol cost support cost, schedule, quality, customer service, plans, cross sections, Special provisions, details, bid items, quantities, staging plans, schedule, Geotech info, traffic, storm water, utilities, staking, testing, estimate, conflict resolution, teamwork, VECP's, change order.

Which software program(s) do you use to track and display your performance measures?

Ken Solak - Primarily Excel.

WORKZONE SAFETY

(Mark Rolfe – Connecticut DOT)

- How does you state handle the installation and removal of temporary sign patterns on limited access highways with high traffic volumes? Are rolling road blocks allowed? If so, is there a time limit or portion of the sign pattern for which a rolling road block is allowed?

Shaun Ng - The answer comes in two parts. First, we require the use of an attenuator vehicle to set and pick up traffic control for all freeway operations, including lane and ramp closures:

Except where prohibited, use an impact attenuator vehicle:

1. To follow behind equipment and workers who are placing and removing components of a stationary lane closure, ramp closure, shoulder closure, or any combination. Operate the flashing arrow sign in the arrow or caution mode during this activity, whichever applies. Follow at a distance that prevents intrusion into the workspace from passing traffic.
2. As a shadow vehicle in a moving lane closure.

Rolling blocks – Rolling blocks by the contractor are not allowed. Only the CHP can impede the free flow of traffic in accordance with the following California Vehicle Code provision: 22400. (a) No person shall drive upon a highway at such a slow speed as to impede or block the normal and reasonable movement of traffic unless the reduced speed is necessary for safe operation, because of a grade, or in compliance with law. No person shall bring a vehicle to a complete stop upon a highway so as to impede or block the normal and reasonable movement of traffic unless the stop is necessary for safe operation or in compliance with law.

If rolling blocks are necessary, the contractor needs to make prior arrangements, at least a week in advance, with the RE so that COZEEP services can be requested and obtained. As a point of reference, for certain operations, like installation of bridging overhead signs, we have routinely used multiple COZEEP officers to provide a slow rolling block and bring the freeway to a complete stop for not more than 10 minutes. Additional PCMS are used to alert the public to the potential for stopped traffic on the freeway for these operations.

- Has your state experienced a shortage of State police officers available for duty on construction projects? How do you handle?

Shaun Ng - Shortage of COZEEP – this is a continuing challenge. There are times when CHP officers are not available due to other priorities.

One work around for Caltrans is coordination with CHP. The goal is to work out of the closes office; however, if prior arrangements are made, CHP will provide support from another office if Caltrans is willing to pay the additional cost.

Because COZEEP is not a contract bid item, it is State Furnished Material, it is implemented at the discretion of our RE based on funds and as outlined in the Construction Manual.

(As background, about 10-12 years ago COZEEP was a contract item, but some contractors refused to work if COZEEP was not available, without realizing that COZEEP was a finite resource for both funding and personnel, this is one of the reasons that COZEEP was removed as a contract item at that time.)

Currently, Caltrans has developed a draft specification and is identifying pilot projects to implement a 50/50 cost split for COZEEP service between Caltrans and the contractor.

Appendix E

State Discussion Topic Responses from Oklahoma

AASHTO Subcommittee on Construction
2016 State Discussion Topics

Does your state have a spec and guidance documents for collecting digital as-built data? If not, are you planning to develop these and collect any digital as-built data during construction, particularly subsurface features location data?

Oklahoma does not have a Spec. We do plan on developing a specification to standardize the digital data to be provided by the Department and potentially to specify the digital data to be supplied at the end of construction for our Department records.

Describe any increased contractor use of automated inspection equipment (e.g. UAVs, Lidar) or automated heavy equipment (i.e. run/guided by GPS) and how that has worked.

Many of the contractors in Oklahoma have been using automated machine guidance for their earthwork operations for several years at their own discretion. Lidar has been used for design on a limited basis, but this data is still used to produce 2D paper plans.

How are DOTs using 3D models and GPS equipment in construction for QA and measurement for payment? What is each state using for e-Bidding? We are looking for something out of the box (as much as possible).

Oklahoma DOT provides the digital files necessary for bidding and to create a 3D model, but it is the responsibility of the contractor to produce the model.

http://www.odot.org/c_manuals/specprov2009/oe_sp_2009-110-1.pdf

If a contractor would use Automated Machine Guidance (AMG) on a project, what issues with the 3D model would force them to revert to manual methods?

Any discontinuity in the model could force the contractor to revert to conventional methods, however, the contractors have been more inclined to fix the model to continue forward.

Do any States have any type of American Disabilities Act training for temporary or permanent facilities to help educate staff on proper installation? How do you ensure proper installation?

The Oklahoma DOT has an informal training for the field personnel to review our ADA Standards and a brief overview of the history of these requirements that is provided by our Department Civil Rights personnel.

Here are the standards relating to wheelchair ramps and tactile warning devices:

<http://www.odot.org/roadway/roadway2009/R-22.pdf> and <http://www.odot.org/roadway/roadway2009/R-23.pdf>. It is the responsibility for the Residency personnel to verify compliance within the allowed tolerances prior to paying for any segment of sidewalk.

What is the max RAP/RAS % other states are allowing in mixes?

Oklahoma DOT's special provision on RAP/RAS can be found at http://www.odot.org/c_manuals/specprov2009/oe_sp_2009-708-21.pdf.

What procedures do states use for HMA verification and the collection of certified weight tickets?

Traditional method of project inspector collecting tickets on the project site as they are delivered.

Any best practices on sealing new concrete for longevity? Better results with hot material or with neoprene seals?

Here is the link to Oklahoma's joint sealant standard: <http://www.odot.org/roadway/roadway2009/R-14.pdf>. The standard says, "Unless otherwise specified in the plans, only the silicone sealant option will be allowed."

Does your state allow projects to be flown by Drones for construction inspection or progress monitoring? If so, does your agency have a policy for this?

Oklahoma has not used drones for these purposes and no policy exists for their use.

With respect to Staging and Excess materials stockpile locations, how does your DOT address contractor controlled sites off right of way and address Tribal concerns for cultural resources?

Oklahoma requires that the contractor comply with all Federal, Tribal, and State regulations. Some long established tribal regulations are provided in the bid proposal by special provision

How do states handle approvals and specifications for competing products? For example, there are several competing pipe products – how do states decide which are acceptable?

Oklahoma DOT has an Approved Product List (APL) with products that have been through some level of approved testing. The project plans will specify standard products and the contractor may request a substitution with a product on our APL. This substitution is to be documented by change order.

How are asphalt hot mixes bid and paid for in your state: separately as binder and aggregate or together as mix? Are there any specific reasons for which method was chosen and are there any issues?

Oklahoma DOT pays for asphalt as the combined mix by the ton and has no plan to alter this method of payment. We chose this method due to the ease of documentation.

CPM for all types and sizes of projects? Do they have support from industry?

The Oklahoma DOT allows the use of an activities schedule chart with a written narrative. Alternatively, a contractor may use a CPM schedule. On larger projects, the contract will specifically require a CPM schedule.

What type of software is being used by state agencies to review schedules?

Big Chief tablet and a #2 pencil?

Training: Do they provide training to industry?

No.

How do they ensure consistency across the state? What process does each state use to determine allowable work windows for construction projects?

For extra work on a force account basis, labor is verified by wage rates and material costs are supported by invoice. Does every state use Blue Book Rental Rates to reimburse the contractor for equipment ownership costs and operating costs. This is published by Equipmentwatch, also known as Penton Business Media. The annual subscription costs for these rates are escalating every year. Does any state use another method to reimburse contractors for equipment costs on force account?

Oklahoma uses EquipmentWatch for Blue Book Rental Rates. We have an enterprise account for this service.

What extra work at force account billing system do other state DOT's use to track and reconcile time and material work performed by the contractor?

The hours worked are tracked manually and recorded in the DWR's in SiteManager by Department personnel and agreed to by the contractor.

Do you require the contractor to invoice the work and just pay lump sum based on the invoice?

No. The contractor must supply invoices/survey/measurements for any material necessary to complete the work. The labor and equipment are tracked manually. These are used to create a unit price for the work.

Do any State Dot's use any "off the shelf programs for time and material billings"?

No.

Do these programs include approved hourly rental rates?

N/A

Do you contract out work on your construction projects to consultants?

If so, do you use standardized templates for preparing your consultant contracts?

Would you be willing to share those templates with other DOTs?

How long does this process typically take?

We enter into an on-demand contract with multiple consultant firms (currently there are about a dozen under contract) and then we negotiate a task order for them to provide services on a specific construction contract. The contract has the flexibility to select a firm to provide various services on each task order from Level 1 (for renting a technician) up to Level 3 (for the full residency function along with a registered professional engineer). We go through a solicitation every two years to select the firms to have on contract which takes 3-4 months. The issuance of the task order for a specific project with a defined scope can typically be done within a month if everyone is diligent in working on it.

See attached Request for Services, Approved Task Order, Sample Solicitation, and Construction Management Contract Template.

Do any States have a process where they track and ensure subcontractors are being promptly paid each month for work performed (Prompt Payment)? If so, is this a State requirement or Federal? If so, what type of process or system is being used to track this information? If so, do you have an enforcement clause in your specifications?

Do any States have a prompt pay requirement for completed extra work? How do they monitor and ensure payment to the prime and subcontractors?

Oklahoma DOT uses a complaint driven system. We do not monitor or track every payment until a subcontractor brings an issue to our attention. We do have a contract clause to require the prime contractor to pay subcontractors within 15 days from the receipt of each payment we make to the prime contractor (49 CFR 26.29 requires payment within 30 days). See attached XSPN109-8.pdf.

For projects on State right of way but within Central Federal Lands jurisdiction, which specifications are used for design and contract administration? The Central Federal Land's or the State

Oklahoma DOT very rarely gets involved with a project on Federal Lands, but if it is let through our system, it designed and administered using State specifications. Typically, Federal Lands will design and administer their own contracts in Oklahoma.

Any other states requiring this on projects? Or done pilots?

If so, to what level (e.g. Acceptance, Acceptance in combination with Nuclear Moisture/Density Gauge, QC, Mapping for uniformity and weak areas, Information only, other...)

Any correlations between IC and density?

If required, do you still drilling the same number of cores for testing and payment?

Oklahoma DOT has only used IC on a small number of trial projects for QC and roller mapping for evaluation and testing purposes. They are still required to perform all of our standard nuclear density and coring at this time.

Do you track performance measures on your construction projects?

If so, which performance measures do you track?

Which software program(s) do you use to track and display your performance measures?

Oklahoma DOT tracks several performance measures such as contract growth, liquidated damages, B-Time incentive/disincentive, smoothness incentive/disincentive, and timeliness of project finalization. We use SiteManager to track most of these measures.

How does you state handle the installation and removal of temporary sign patterns on limited access highways with high traffic volumes? Are rolling road blocks allowed? If so, is there a time limit or portion of the sign pattern for which a rolling road block is allowed?

Rolling roadblocks are not prohibited by our specifications, but they are not used for this type of work. The contractor may propose any method that seems necessary for the installation of this work to the Residency. And the Resident Engineer will determine if these measures are necessary for the installation.

Has your state experienced a shortage of State police officers available for duty on construction projects? How do you handle?

Rarely. The Oklahoma DOT has always worked well with the Oklahoma Highway Patrol to keep them informed on our project schedule, and in turn, the OHP has been a good partner to us. I am sure it doesn't hurt that the Troopers are paid time and a half for this work. When OHP is unavailable, the plan notes typically allow for local law enforcement with jurisdiction to be used as approved by the Engineer.

Appendix F

Contract Administration Section Report

Minutes
 2016 AASHTO SOC Annual Meeting
 Contract Administration Section Meetings
 Big Sky, Montana
 August 15 and 18, 2016

Monday, August 15, 2016

- 1. Welcome / Administrative Issues** – Gary Angles, Ohio DOT, introduced himself and welcomed everyone to the meeting. Gary distributed a sign-in sheet to the group and requested that the list be revised and updated as necessary (a final attendance list is appended to these minutes). A list of the attendees is attached to these minutes.

Gary introduced Vice Chairs Sue Eiseman (Kansas DOT), Andy Long (Wyoming DOT), Research Coordinator Richard Duval (FHWA), and Secretary Jerry Yakowenko (FHWA) and thanked them for their service during the past year. Self-introductions followed.

2. Overview of 2015-2016 work plan items

On Monday, August 15th, Gary moderated a discussion of the 2015-2016 Section workplan items and coordinators for these items provided overview presentations as follows:

- a. Sue Eiseman provided an overview of the survey titled [“Incentive/Disincentive clauses for purposes other than timely Contract Completion”](#). Seventeen states responded to the survey which provides a summary of the use of incentive / disincentive provisions for various construction requirements including contract requirements for environmental issues, safety, maintenance of traffic, materials and the quality of construction items. The survey was completed in November 2015 and is posted on the SOC web site. :
- b. Jerry Yakowenko provided an overview of the update of the SOC’s [“Survey on the Commodity Price Adjustment Clauses for Inflation”](#). The survey was completed in January 2016 and is posted on the web site.
- c. Professor Doug Gransberg gave an overview of the survey titled: [“Contract Bonds and Warranty Bond Requirements”](#). Twenty-nine responses were received for this survey which was completed and posted on the SOC web site.
- d. Mark Rolfe, Connecticut DOT, gave an overview of the “Project Scheduling Survey “. The survey was completed in August 2016 and will soon be posted to the SOC web site.

3. Preliminary Discussion of the Proposed 2016-2017 work plan.

The Section members discussed potential new workplan items from the following list of issues and questions:

1. What are other states doing with warranties for design-build and design-bid-build?
2. What are states requiring for insurance beyond minimum state insurance requirements?
3. AASHTO Guide Specifications Review (Section 100)

4. Risk-based inspection methods / State staffing guidelines (upon request, support NCHRP 20-107 “Effective Construction Project Staffing Strategies for Transportation Agencies” – awarded to University of Kentucky June 28, 2016.)
5. State acceptance of pipes / inspection of cracks in concrete pipe/ deformation in HDPE pipe
6. Are specifications being revised for current technology?
7. Survey of state practices for processing progress payments or reviewing contractor invoices.
8. Survey Regarding State DOT Approaches for Dealing with Unsatisfactory Contractor Performance .

4. Preliminary Discussion Regarding Recommendations for Presentations at the 2017 SOC Meeting Contract Administration Section

The Section members discussed potential presentations for the Contract Administration Section portion of the 2017 Subcommittee Meeting in Cincinnati, OH. Suggestions for potential presentations are listed below. The Contract Administration Section leadership will discuss these suggestions and develop a final list during the monthly conference calls in 2016-2017.

- Presentation on NCHRP 10-92 and 20-7 Task 349 Quality Acceptance Plans for alternative delivery (Sid Scott)
- Partnering Survey NCHRP 19-10 (Gransberg)
- Index Based-Cost Estimation (Duval and CDOT)
- Performance Specifications (Dr. Shree Rao /Bill Vavrik/ Steve Gillen)
- Progressive Design-build (MDSHA I-270)
- VDOT Elizabeth River
- Ohio/Kentucky Louisville PPP project
- Georgia 285 PPP
- Tappan Zee
- Caltrans CM/GC Fresno (Tritt or Dongo)
- Tennessee’s first CM/GC project (Will Reid)

5. Preliminary Discussion Regarding Potential Research Recommendations

Richard Duval led a discussion of the following potential research items to determine the CA Section members’ interest and relative priority of research items.

1. Guidebook for Estimating Contract Time and Evaluating Accuracy
2. A Guidebook/Synthesis on the Impact of Accelerated Construction Methods and Technologies for Transportation Infrastructure
3. Streamlining the Data Management Process across Entities, Phases, Locations, and Time
4. Effective Practices of Incentives/Disincentives to Reduce the Time to Complete Transportation Projects

5. Synthesis of factors (Pre and Post Qualifications) to consider in determining whether a contractor is a responsible firm
6. How to analyze insurance policies for highway construction projects
7. What are insurance requirements for projects and what are the risks. Should certain components be separated out? This may be a good 20-07 project. How do agencies make decisions on what they require? How to analyze insurance policies and what questions should be asked.
8. Synthesis of various manuals, processes and procedures from various states for Quality Management of QAP
9. Identify the difference in standards that work is completed to if delivered through Design Bid Build vs. Design Build - Are we getting longer life? What standards to use? Are there differences in quality?
10. Quality Requirements in Procurement Documents and Contract - Procurement documents to manage quality. Non-compliance points for quality. FHWA has developed some work on prequalification.

Doug Gransberg mentioned that he was considering the development of a research needs statement for a 20-07 project on analysis of contractor insurance requirements, which appeared to be of interest to both the Safety, Environment and Workforce Development Section and the Roadway and Structures Section.

Thursday, August 18, 2016

- 6. Final Discussion of the Proposed 2016-2017 Work Plan.** - The Section members further discussed the potential workplan items that were developed on Monday and then developed a prioritized list of workplan items for the coming year.

After some discussion, the Section members tabled items No. 1 and 2 as some of these issues may be addressed in upcoming proposed research. The Section members agreed to support item No. 3 that may be covered under NCHRP 20-107. One of the Section members indicated that the Roadways and Structures Section may have or had a workplan item for item No. 5 – State acceptance of pipes. It was also agreed that No. 6 was a subset of item No. 3 and therefore, this item was not considered.

The Section members agreed to pursue items No. 3, 7, and 8 (as numbered above) during the coming 2016-2017 year. This included the following tasks (Lead task coordinator and assisting members identified in parenthesis):

- a) AASHTO Guide Specifications Review (Section 100) The following CA Section members volunteered to assist with the review of the Guide Specifications : Andy Long – Wyoming DOT, Professor Douglas Gransberg, Jerry Yakowenko - FHWA, Sue Eiseman – Kansas DOT, Jason Gutting – Michigan DOT, Chris Costello, Michelle Page – Utah DOT)
- b) Survey of state practices for processing progress payments or reviewing contractor invoices. (Lead Jerry Yakowenko – FHWA , Professor Douglas Gransberg, Shailendra Patel – Virginia DOT, Ryan Griffith – Kentucky Transportation Cabinet)

- c) Update of the 2013 Survey Regarding State DOT Approaches for Dealing with Unsatisfactory Contractor Performance (Keith Platte – AASHTO (confirm?), Tim Taylor University of Kentucky, Jerry Yakowenko – FHWA , Jeff Benefield – Alabama DOT , Jason Gutting – Michigan DOT, a representative from Wyoming to be named by Andy Long)

7. Discussion Regarding Potential Presentations for the 2017 SOC Meeting The Section members agreed that the Section members would prioritize and finalize the list of presenters for the 2017 SOC meeting during conference calls in November through January. This would allow opportunity for consideration of potential presentations from TRB and other venues.

8. Final Discussion Regarding Research Priorities - Richard Duval led a discussion of the merits of the various research topics noted above. The Section members prioritized Nos. 1, 3, and 6-7 (combined).

At the 5:30 PM, August 18th Research Steering Committee Meeting, the SOC Research Group elected to advance the following 3 topics as prioritized. The contact information in parenthesis represents the CA Section members who volunteered to assist with the coordination of these topics:

1. Streamlining the Data Management Process across Entities, Phases, Locations, and Time (Joint Research Project with the Technology Section and it may be possible to have AASHTO's Asset Management subcommittee to co-sponsor this. Keith Platte will approach them. A related research needs statement developed by TRB's ABJ95 Sub-committee on CIM will be reviewed. Review/assistance from Professor Douglas Gransberg(Iowa State University), Rob Wright (UT), Katherine Holtz (TX), Mark Rolfe (DE), Sue Eiseman (KS), Paul Goodrum (University of Colorado) agreed to work on this.
2. Guidebook for Estimating Contract Time and Evaluating Accuracy (Tim Taylor – University of Kentucky, Lamar Sylvester, North Carolina DOT; State DOT sponsor for the research Jason Humphrey, South Dakota DOT)
3. A Guide to Automate Project Progress Control by Leveraging LiDAR and 3D/4D Information Models – Automate progress tracking of transportation projects, bridge construction projects in particular, by leveraging 3D LiDAR point clouds and 4D information models. Basically this would look at taking 3D models and developing as-builts. - It may be possible for the AASHTO Subcommittee on Design to co-sponsor this project. Keith Platte will pursue this. Tom Ravn will go back to the Integrated Construction & Technologies Section seek volunteers to develop this research needs statement. Richard Duval (FHWA) agreed to help. Potentially submitting as a NCHRP 20-7

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Benefield	Jeff	Alabama DOT	benefieldj@dot.state.al.us	(334) 242-6213
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Catalanotte	A. J.	CH2M HILL	aj.catalanotte@ch2m.com	(414) 491-9938
Chisolm	Richard	Mississippi Department of Transportation	rchisolm@mdot.ms.gov	(601) 359-7301
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Deery	Brian	AGC	deeryb@agc.org	(703) 837-5319
Duit	Tim	TTK Construction	timduit@ttkconstruction.com	(405) 340-0438
Dunham	John	ConnDOT	John.s.dunham@ct.gov	(203) 591-3540
Durbin	Lisa	Montana DOT	ldurbin@mt.gov	(406) 444-0453
Duval	Richard	Federal Highway Administration	richard.duval@dot.gov	202-493-3365
Eiseman	Susan	Kansas Dept. of Transportation	susan.eiseman@ksdot.org	(785) 250-7839
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Gendreau	Cal	North Dakota DOT	cgendrea@nd.gov	(701) 328-2563
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Holtz	Katherine	TxDOT	Katherine.holtz@txdot.gov	(512) 201-3612
Humphrey	Jason	South Dakota DOT	jason.humphrey@state.sd.us	(605) 773-4391
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kerness	eric	Dispute Resolution Board Foundation	eric@kerness.com	(518) 928-9433

Kitsis	Ted	NH DOT	tkitsis@dot.state.nh.us	(603) 624-8175
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Lenz	Russell	Raba Kistner Infrastructure	rlenz@rkci.com	(512) 904-9177
Liva	Geno	Montana DOT	gliva@mt.gov	(406) 494-9626
Long	Andy	Wyoming Department of Transportation	andy.long@wyo.gov	(307) 777-4425
Lowe	Scott	Trauner Consulting Services, Inc.	scott.lowe@traunerconsulting.com	(215) 814-6414
Nemfakos	Charles	Montana DOT	cnemfakos@mt.gov	(406) 579-7327
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Wells	Leroy	Wyoming DOT	Leroy.wells@wyo.gov	(307) 352-3032
Yakowenko	Jerry	Federal Highway Administration	gerald.yakowenko@dot.gov	(202) 366-1562

Appendix G

Roadways and Structures Section Report

Roadways and Structures

Meeting Agenda

AASHTO Subcommittee on Construction

August 15 - 19, 2016

Big Sky, Montana

2016 Section Leadership

Chairman – Marc Mastronardi, Georgia DOT

Vice Chairman (Roadways) – Kevin Christensen, Montana DOT

Vice Chairman (Structures) – Vacant

Secretary – Anthony Sarhan, FHWA

August 15, 2015

Monday – August 15 (1:15 – 4:00 PM)

Mr. Mastronardi called the meeting to order at 1:15PM

Introductions:

Members introduced themselves.

Representation from –

AASHTO, AHTD, GDOT, MEDOT, MODOT, MDT, PennDOT, WVDOT

FHWA

ACPA, ADS, Fisk & Associates, Forterra

A list of attendees including contact information is included at the end of these notes.

2015/2016 Work Plan: The group discussed the status of the following items from the 2015/2016 work plan.

1. Survey of state practices regarding travel on milled surfaces

Mr. Sarhan provided a brief presentation of the survey results. Mr. Sarhan will e-mail State DOT and AASHTO attendees the survey results.

This work item is complete.

2. Survey of current state of practice for risk based inspection

Mr. Sarhan provided a brief presentation of the survey results. Mr. Sarhan will send out the comments and survey results to the attendees for additional consideration. This item is complete, but a carry on item may be part of the 2016 – 2017 work plan based on feedback from the group.

This work item is complete.

3. Survey on state adoption of MASH-08

This work item was suspended with the release of the [January 7, 2016 Memo on the FHWA/AASHTO Joint Implementation Agreement for Manual of Assessing Safety Hardware \(MASH\)](#) and accompanying [FHWA Q&A](#).

The group agreed that no other work is necessary for this work item.

This work item is complete

4. Support and provide technical review and assistance for the AASHTO Guide Specification rewrite
Mr. Mastronardi led a discussion regarding the status of the contract, the current schedule for the rewrite of the Guide Specification, and the role of the Roadway and Structures Section. The subcommittee on construction has hired a consultant through the research program to work on the rewrite. To date there has been limited engagement with the consultant, but a basic roadmap has been developed and provided to SOC. Section support for this effort will remain a priority for the coming year, and this section in particular may take on the review of sections that fall outside the scope of the consultant's effort.

This work item will carry over into the 2016/2017 work plan and will be a standing agenda item for the monthly conference calls.

This work item will carry over into 2016/2017

5. Survey of current state practices regarding Speed Reduction through Work Zones
Section members agreed to suspend the development of a survey due to the release of NCHRP Synthesis 482 Work Zone Speed Management, and would revisit developing a survey after reviewing the Synthesis.

The Florida DOT led the Synthesis review and Mr. Sadler provided a number of follow up questions for consideration as well as a summary of the current state of the practice in Florida.

The FDOT has moved away from blanket speed reductions in work zones. Generally the FDOT is making the decision on where speed reductions are to be implemented and the magnitude of the reduction. Design Build jobs tend to pose a challenge due to the direct relationship between the designer and the contractor. For example, the FDOT has had some disagreement recently with a design-builder who reduced work zone speed to 55mph in a tangent section that is normally 70.

FDOT is also starting a program using VMB's that will flash speed and fine in coordination with FHP to give tickets.

Question from Keith Platte – Did the synthesis address safety aspects?

Response – yes.

Follow up comment from Mr. Platte – the whole point of this is to have a safer work zone. If we're not able to achieve that then we've missed the point.

Follow up comment from Mr. Sadler - FDOT is trying to engage some judges including taking them out to some work zones so they can experience the rush of traffic going by in a work zone. Citations include statistics on traffic in workzones.

Mr. Ahlvers – The Missouri DOT also has a lot of interest in the role of law enforcement in work zone speeds.

Mr. Sarhan will send out the synthesis and questions developed by the Florida DOT to the attendees.

This work item is complete

6. 2003 Guide to Major Types of Transportation Construction Specifications

Mr. Doyle presented an Overview of guide and proposed a new section covering Performance Specifications.

After the presentation Mr. Mastronardi opened a group discussion centered on the fact that the Guide Spec is generally written as a method spec.

Mr. Ahlvers – MODOT tried to rewrite their spec book in 2004 to move away from method based. Should we survey states to see how many are still using method specs?

Mr. Mastronardi – We need to see if we can get into the innovative contracting areas? This is something that needs to happen, but we might not be able to under the current update.

Mr. Ahlvers – It would be nice to be able to grab the guide spec to see what the latest and greatest specs are in different areas rather than reaching out to folks.

M. Mastronardi – The Georgia DOT is being challenged by their P3 and Design Build projects. There have been a few “why didn’t we think of that?” moments?

Mr. Hancock – A lot of the groups behind some of the new innovative work (e.g. ABC) have already done the research.

Mr. Mastronardi – If we move forward with an update to the guide perhaps it can wind up as a chapter in the guide spec?

Question - How would warranties be enforced?

Response - Some states have had success using warranties. At least one state had a big legislative push with warranties and weren’t seeing any improved performance.

Missouri did a few “Koch Road” projects a few years ago, but stopped.

As part of the presentation Mr. Doyle presented a proposal focused on the following updates:

- Minor updates to the existing guide sections (Method, End Result, QA, Performance Related Specifications (PRS), and Performance Based Specifications (PBS))
 - Coordinate PRS updates with FHWA’s Turner Fairbank Highway Research Center (TFHRC)
- Add a new section to explain “Performance Specifications” in general. This section would be placed before the QA specification section.

The proposal was accepted by voice vote of the group with no dissent noted.

Mr. Sarhan solicited the group for volunteers willing to participate on a task force to deliver the guide updates. Mr. Ahlvers agreed to co-chair the task force along with Mr. Doyle. Mr. Hancock and Mr. Mastronardi volunteered to be part of the task force.

This item will carry over to the 2016/2017 work plan.

Research

The research meeting is scheduled for Tuesday morning at 6:30 AM. Mr. Mastronardi opened the floor for any proposals to be taken to the research meeting for consideration.

Mr. Anderson (MEDOT) asked if anyone has looked into pile driving and endangered species – very specific to noise. How to mitigate the noise and work within the regulations.

- The group discussed two distinct technologies currently being used or studied
 - o WSDOT “double wall pile” – MEDOT has been in contact with the WSDOT
 - o Bubble curtains

Mr. Anderson (MEDOT) asked if anyone else is experiencing unexplained aggregate loss in the surface of asphalt pavements that appears to be premature. No other members in attendance indicated that this was an issue. Mr. Mastronardi asked if the MEDOT had looked into whether they were getting asphalt with Recycled Engine Oil Bottoms (REOB).

Mr. Ahlvers (MODOT) asked how states are doing their quality acceptance for survey when contractors are using 3D plans.

- FHWA has started looking into this. Contractor’s role for qc and how the agencies need to do some level of acceptance plays into this.
- GDOT just started some research with Georgia Tech on this exact topic. With the use of AMG the GDOT is not doing as much hub staking. What is the right tool to make sure we are getting what we expected?
- MODOT starting to look into the other options.
- FDOT is starting to see some of this in DB jobs.
- MEDOT had issue on one project recently. The contractor’s point was set up on a building and someone accidentally bumped it and no one noticed for a week.
- AASHTO mentioned that this same topic came up in another group. In that instance the conversation focused on the fact that the contractor gives state their equipment and model.
- Who’s actually doing it? What is the DOT’s role in quality assurance of contractor furnished staking?
- One piece of this to keep in mind is that the DOT should keep their own control points so the DOT can independently check the contractor’s work.
 - o Based on experience from MEDOT need to have separate points.
 - o GDOT gives control package and gets out of the way

The group concluded that this discussion broke down into two separate items for consideration

- 1 Agency verification of contractor furnished staking
- 2 Agency acceptance/verification of 3D modeling.

Mr. Sarhan will discuss these topics with David Unkefer to see if there is anything already underway in this area

Mr. Ahlvers asked if anyone is using new technology to measure quantities (e.g. rovers, uav’s)

- o FDOT contractor is using uav’s to monitor stockpiles
- o iPhone app

Mr. Anderson asked how DOT’s handle the availability of uniformed police in work zones. Can we use sheriff rather than just state troopers?

- o AHTD – contractors have hired local police for presence. AHTD also has a highway police .

- MEDOT – use local police off the interstate, the question is what about once they are on the interstate.
- GDOT – use local, however there are some jurisdictional and availability limitations
- FDOT – have faced same issue as MEDOT regarding availability of officers on the interstate
- GDOT has started to question the effectiveness. For example what happens on a commuter route when the daily routine traffic realize there were no consequences.

Mr. Mastronardi asked if anyone has looked into mass concrete specifications. Based on general comments from the group this item appears to be a GDOT focused issue.

Mr. Mastronardi asked if anyone is looking at how they are determining contract time.

- MODOT – has recently changed how they are approaching resurfacing. Projects are let in February and have to be complete by October, and it is the responsibility of the contractor to complete the work on time.
- MDT – have started using flex time similar to MODOT

Mr. Robinson (PennDOT) –What is the next step with Intelligent Compaction – is anyone using it? Do we specify it? Do we ask the contractor?

- The general consensus of the group is that it appears to be a good QC tool but is not ready for acceptance. Some members recommended contacting the MnDOT and TXDOT.

AASHTO Guide Specification:

This item was discussed during the recap of the 2015/2016 work plan.

Open Discussion:

FDOT – has anyone seen a device called “Flagger Joe”? Mounted stop/slow paddle.

- No comment from the group.

AHTD has recently changed their tack coat specifications. Field cutting is no longer allowed. Starting to see tracking. This is the first construction season with the new specification.

- G.Doyle – there were a number of FHWA/AI workshops. Get Jason Dietz in contact with AHTD.
- MODOT – sometimes specify UBOS or trackless tack

PennDOT – does anyone have experience using polyester overlay for bridge decks?

- WSDOT has done a lot of it. It works well and is more durable. Contractors don’t use it unless WSDOT specifies it.

Adjourn: The meeting was adjourned at 4:00 PM

Thursday - August 18(1:15 – 3:00 PM)

Introductions: Members introduced themselves. See attached sign-in sheet for attendance.

TC3 Solicitation

On behalf of TCCC Mr. Mastronardi asked if members would be interested in volunteering as SME’s for the development of structure inspection courses.

2015/2016 Work Plan:

1. Survey of state practices regarding travel on milled surfaces
This work item is complete
Anthony to distribute survey data to R&S membership.
2. Survey of current state of practice for risk based inspection
Need to coordinate with Contract Administration to determine future status of this work item
Anthony to distribute survey data to R&S membership.
3. Survey on state adoption of MASH-08
This work item is complete
4. Support and provide technical review and assistance for the AASHTO Guide Specification rewrite
This work item will carry over into the 2016/2017 work plan
5. Survey of current state practices regarding Speed Reduction through Work Zones
This work item is complete.
Anthony to distribute NCHRP study and list of follow up questions from Florida DOT to the R&S members.
6. 2003 Guide to Major Types of Transportation Construction Specifications
This work item will carry over into the 2016/2017 work plan.
Task Force Co-Leads: Greg Doyle (FHWA), David Ahlvers (MODOT)
Task Force members: John Hancock (GDOT), Marc Mastronardi (GDOT)

Research Update:

The group discussed the topics presented at the Tuesday research meeting. Please see notes from the research meeting for a summary of the topics discussed

Mr. Mastronardi, Mr. Sadler, and Mr. Ahlvers expressed their desire to keep the focus of this group on workzone law enforcement.

Mr. Hancock concurred and suggested that the Design-Build vs. DBB study as a second choice for this group.

The group then discussed what types of issues would need to be considered for work zone law enforcement research.

- Mr. Anderson (MEDOT) expressed a need to consider availability (off duty officer vs. on duty, State Patrol vs. local police)
- Mr. Henning (AHTD) commented that the ability of off duty officers to enforce might be worth looking into.
- Mr. Hancock (GDOT) asked whether there is a good understanding over who can write tickets in various jurisdictions across the country.
 - Mr. Christensen (MDT) commented that off duty officers can write tickets in Montana.
- Mr. Sadler (FDOT) concurred with Mr. Anderson and commented that often times FDOT is competing with malls.
- Mr. Gaines (WSDOT) asked how we determine if we have value added? Can we determine if accidents are reduced when you have presence?
- Mr. Anderson (MEDOT) suggested that rolling roadblocks be looked at as well. The Maine DOT has found they can really only use them in off-peak times and they'd like to get a sense of other DOT's experience.

- o Mr. Mastronardi commented that this practice is known as pacing in Georgia and is completely controlled by the contractors based on a specification that establishes time limits.

AASHTO Guide Specification:

No further discussion on this topic. This will be a standing agenda item for the 2016/2017 monthly conference calls.

Presentation Topics:

The group brainstormed possible presentation topics (listed below). Roadways and Structures members will use the following list to start discussions on presentations for the 2017 Subcommittee on Construction meeting next year.

- a. Louisville Southern Indiana Ohio River Bridges Project
- b. Cleveland Inner Belt
- c. FRP use in bridges
- d. FDOT wax on tendons
- e. Tappan Zee
- f. NV DOT best practices
- g. Emulsion task force
- h. Tack coats, fibers in asphalt, RAS
- i. Challenges with recycled products
- j. Rubblization – this could also be a survey for our work plan.
- k. 2003 Guide to Major type of Transportation Construction Specifications
- l. Converting HMA routes to surface treated routes
- m. NCAT or MnRoad
- n. MODOT new Mississippi River Bridge
- o. Maine DOT Sarah Mildred Long CMGC project
- p. Northwest Corridor (GDOT)
- q. Pile driving advances (e.g. double walled piles, noise mitigation for endangered species in the air or water)
- r. Resource agency considerations for demolition

2016-2017 Work Plan

The group agreed on the following items for the 2016-2017 Work Plan:

- 1) Support and provide technical review and assistance for the AASHTO Guide Specification rewrite.
- 2) Update and revise the 2003 Guide to Major Types of Transportation Construction Specifications. David Ahlvers (MODOT) will be lead.
- 3) Develop and conduct survey on the use of rolling slowdowns or pacing. Marc Mastronardi (GDOT) and Devin Anderson (MEDOT) will be co-leads.
- 4) Develop and conduct survey on ground in center-line rumble stripes and edgeline rumble stripes. David Sadler (FDOT) will be lead.
- 5) Develop and conduct survey on pavement smoothness measurements. David Sadler (FDOT) will be lead.
- 6) Investigate the use of alternative Load transfer devices for PCCP. Joe Robinson (PennDOT) will be lead.

Vice Chair Vacancy

Joe Robinson volunteered to take the vacant vice-chair position.

Open Forum

Question 1 (MEDOT) – Is anyone else having issues with aggregate loss on HMA? The Maine DOT has seen routes lose aggregate in 1-2 years?

Responses to Question 1

GDOT - We have seen some early loss of aggregate on a PEM course but that's it.

FDOT – Our main issue is still end of load segregation.

MODOT – We had issues with high RAP/RAS mixes, but otherwise aggregate loss hasn't been an issue.

The general consensus of the group is that aggregate loss is currently not an issue that they are aware of.

Question 2 (GDOT) – How much AC credit are other state DOT's giving when using RAP?

Responses to Question 2

MODOT – 30% appears to be the limit and above that you need to blending charts.

Question 3 (WSDOT) – Is anyone allowing recycled concrete as aggregate?

Responses to Question 3

AHTD – Yes in PCCP.

FDOT – Yes in base course

A member commented that the Illinois tollway uses it in asphalt.

MEDOT – We allow it in subbase layers

General comments about use in sidewalks

PennDOT – It is allowed in the sub-base. PennDOT remarked that they have received some pressure from FHWA to continue this, however they have experienced problems with reaction that expands and plugs drainage. The practice is currently stopped, and PennDOT is evaluating if there is a safe level

Question 4 (MODOT) – Can we do something to better define risk based inspection? I'd like to pin this down to the inspection aspect.

Responses to Question 4

PennDOT – We have a guideline. Matrix of risk vs. cost. You move through the matrix and pick which work element will be inspected (e.g. installation of pipe under a roadway or pounding posts).

Question 5 (FHWA) – How are people tracking DBE trucking on projects?

Responses to Question 5

GDOT – we have a very aggressive CUF program.

Adjourn

Meeting adjourned at 3:00 PM

2016 AASHTO Subcommittee on Construction
Roadway and Structures Section Meeting Attendance

Name	Affiliation	e-mail address	8/15/15	8/18/15
<i>State DOT, AASHTO, and FHWA Attendees</i>				
David Ahlvers	MODOT	david.ahlvers@modot.mo.gov	X	X
Devin Anderson	Maine DOT	devin.anderson@maine.gov	X	X
Steve Boggs	WVDOT	steve.d.boggs@wv.gov	X	X
Kevin Christensen	MDT	kechristensen@mt.gov	X	X
Mark Gaines	WSDOT	gainesm@wsdot.wa.gov	X	X
John Hancock	GDOT	jhancock@dot.ga.gov	X	X
David Henning	AHTD	david.henning@ahtd.ar.gov	X	X
Dean Jones	MDT	dejones@mt.gov	X	X
Steve Lawrence	AHTD	steve.lawrence@ahtd.ar.gov	X	
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Joe Robinson	PennDOT	josrobinso@pa.gov	X	X
David Sadler	FDOT	david.sadler@dot.state.fl.us	X	X
Bruce Street	AHTD	bruce.street@ahtd.ar.gov	X	
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Doug Wilmot	MDT	dwilmot@mt.gov	X	
Deric Wyatt	AHTD	deric.wyatt@ahtd.ar.gov	X	
Keith Platte	AASHTO	kplatte@ashto.org	X	
Greg Doyle	FHWA	gregory.j.doyle@dot.gov	X	
Anthony Sarhan	FHWA	anthony.sarhan@dot.gov	X	X
<i>Certification Entities</i>				
Mike Clark	NICET	mclark@nicet.org	X	
<i>Industry Attendees</i>				
Jenn Christman	ADS	Jennifer.christman@ads-pipe.org	X	
Barry Bauer	Forterra	Barry.bauer@forterrabp.com	X	
Al Hogan	ACPA	ahogan@concrete-pipe.org	X	
Tryg Hoff	ACPA	thoff@concretepipe.com	X	
Woody Rigdon	ACPA	wrigdon@concrete-pipe.org	X	
Jon Sickels	ADS	jon.sickels@ads-pipe.com	X	

Appendix H

Integrated Construction and Technologies Section Report

AASHTO Subcommittee on Construction – Integrated Construction Technologies Section

(Greg Mulder, Chair, Iowa DOT; Joe Squire, Vice-Chair, Oregon DOT Bernie Kuta, Secretary, FHWA Resource Center)

Review\Comments of 2016 general presentations:

Presentations seemed rushed: possibly fewer or better guidelines on timing...

Need guidelines for graphics for viewing (i.e. size and font style and color scheme)

Group pictures and lists on website.

2016 – 2017 Work Plan

These are the topics that have been agreed to be a focus for the Section over the next year. Many are continuations of prior years and a few were added in Montana during the 2016 SOC meeting.

- Advance Civil Integrated Management (related to FHWA’s Intelligent Construction Systems and Technologies initiative with AASHTO/AGC/ARTBA):
 - 3D/4D/5D modeling,
 - Automated Machine Control/Automated Machine Guidance (AMC/AMG)
 - Intelligent Compaction (IC) - DOT challenges in data analysis and management
 - e-Construction – document management, digital/e-signatures
 - mobile applications/deployment – tablets
 - asset/data management and lifecycle, as-builts
 - Data Standards effort by the Subcommittee on Design may need construction group participation - Greg M will discuss with the IA colleague to offer up a construction rep...
- Promote asset management/operations – physical features, customer contact software, tracking complaints, repairs, and costs, inventory.
 - programming projects
 - 3D as-builts - demo project?
 - systems/software being used and how well they work
 - remote sensing technology – UAV/UAS, LiDAR, etc. (Oregon Research, UK Photogrammetry etc.) bridge deck overlays?
- Technology Considerations in Project Administration
 - time, cost and quality
 - public relations and traveler information
 - electronic payrolls
 - improving workflow consistency with transitions to eConstruction (following up ROI survey -)
 - statewide examples
 - document storage vs. storage vs approvals/signatures
 - what steps are needed to get progress

Potential Surveys:

- e-Construction inventory
 - check for other recent surveys on this topic- CALTRANS will send info to Iowa
 - FHWA (Bryan Cawley) – survey done potentially and this Section may be able to claim credit
 - Survey was not completed but instead did 3D modeling as a section (See PPT slide show)
 - Software for Field Inspection – possible survey to help FHWA (Richard Duval) research project being procured that will focus on Digital Project Inspection
 - Potential ROI needs - what is needed to account for (i.e. Guide) - performance management

- Update of Quick Reference guide to AMG use - old guide is now 4 or 5 years old

Potential Presentations (2017)

- EDC3/4 e-construction update
 - FHWA - Trends, exchanges, status,
- electronic ticketing (safety of workers + Document management)
 - Iowa pilot - Greg Mulder
 - Tagging of materials/RFIDs/Record keeping/bar codes NC
- UAVs
 - report out at SOC 2016 from PB doing national study for FHWA being
 - panel to present on vision of future
- Lessons learned about eConstruction (be aware, What I wish I knew before I started)
 - Oregon – Pegasus GPS example
- ProVal – how to use and read as use for ride correction & grind simulations
 - Bob Orthmeyer (FHWA) or Brian Schleppe (Ohio)
 - Guidance on the use of IRI vs. Profilograph numbers in specs/performance
- Documents Management - Awards/Approval process management
 - DocExpress use in IA ; Greg Mulder (IADOT)
 - Aurigol in Ontario Canada - Douglas Pateman
 - Custom programs in ???
- WZ traffic Cue Warning Systems - communications to traffic & linking to onsite/remote message boards?
 - Work with the Safety program for presentation coordination??? (i.e. SMARTER Workzones)

Potential Research Topics:

- 2D vs 3D - where is 2D still useful? Or not? Stringless (AMG) Asphalt? Milling Operations --- Using technology to maintain “typical” cross sections maintaining breakpoints and cross slopes --- mining data & sharing information / guide specs updates Peer Exchanges/identified leads... lessons learned.
POSSIBLE synthesis of specs, controls
- ICT of SOC will support a Domestic Scan for use of UAVs - draft documents, etc. (Bryan Cawley is contact in FHWA)

Summary/Review of 2016 presentations:

- ✓ Presentations seemed rushed: possibly fewer or better guidelines on timing...
- ✓ Need guidelines for graphics for viewing (i.e. size and font style and color scheme)
- ✓ Group pictures and lists on website are suggested

THANKS TO George Raymond for service to the SOC ICT Section

Appendix I

Safety, Environmental and Workforce Development Section Report

Minutes
 2016 AASHTO SOC Annual Meeting
 Contract Administration Section Meetings
 Big Sky, Montana
 August 15 and 18, 2016

2016 - 2017 Section Leadership
 Chairman – Rob Wight, Utah DOT
 Vice-Chairman – Tracy Cain, TxDOT
 Secretary – Jeff Lewis, FHWA

- Mr. Wight welcomed the Subcommittee members and guests to the 2016 Safety, Environment and Workforce Development Section (SEWD) meeting. The attendees included 19 representatives, including 11 State DOT, 7 private industry/ consultant/ University, and 1 FHWA. An attendance list is attached for reference. We then reviewed the status of the 15/16 Work Plan items, highlighted the accomplishments and updated them as appropriate.

ACCOMPLISHMENTS 2015/2016

- Reported efforts with Center for Environmental Excellence.
- Approval for fall 2016 Domestic Scan on DOT's certification program for technicians.

2016 - 2017 WORK PLAN

ENVIRONMENT

1. Presentation: Consider a panel to present and/or discuss their experiences with programmatic agreements. Also, possible local presentation **Lead: TBD**
2. Recycle and reuse of materials – sustainability & appropriate application of crushed concrete **Lead: Mark C.**
3. Reuse of crumb rubber and RAS presentation **Lead: Darby**
4. PHMSA – Issue with exploding gas lines in CA. MOA between utility and DOT? Having DOT's pay some for Utilities work within the R/W. Add to Workplan - Need to do more research. What is going on in AK? **Lead: TBD**
5. AASHTO Specifications rewrite (ENV portion). **Lead: Sharon**
6. Continue working with Center for Environmental Excellence: **Lead: Rob**

RESEARCH

1. Hazardous materials and how handled by the contractor? DEQ regulates? Impact on insurance? **Lead: TBD**

HUMAN RESOURCES

1. Complete survey and send to Subcommittee members. Looking at data and make decisions on moving ahead. **Lead: Chip**
2. NCHRP 20-68A Domestic Scan 15-01: Developing and Maintaining Construction Inspection Competence. To be held in San Diego mid-October. **Lead: Rob**
3. Structure of safety organization within each Division. **Lead: TBD**

4. Concern with the subcommittee based on the SEWD survey. **By Nov 9th Section mtg.**, Section members review: NCHRP 813 – A Guide to Agency Wide Knowledge Management, and NCHRP 685 - Strategies to Attract and Maintain a Suitable Transportation Workforce. Wes – RxR having same issue and may be worth checking with them. **Lead: TBD**

WORK ZONE SAFETY (TRAVELING PUBLIC and WORKERS)

1. Update by Old Castle? How do I make it happen in my state? Query state to see if any have used it and if used it, what the states thoughts on how it has been used. **Lead: TBD**
2. Have TTI attend conference to provide what their research is finding. Review synthesis. Create survey asking what techniques they are using to improve WZ safety. Integrity of WZ? Non-motorized traffic? Bicycles? For intelligent work zones, Dr. Zech suggested contacts from MassDOT and NH DOT. NH DOT Denise Marco, Susan Soucie, Jerry Ullman TTI- Smart Work Zones - Mobility, Safety, MassDOT. **Lead: TBD**
2. Consider having OSHA give a presentation on their program. BMPs, etc. **Lead: TBD**
3. Traffic control devices – Contractor to develop per MUTCD which is around vehicular devices. Ped issues becoming more onerous to address and tools for peds WZ are missing. FHWA is creating approximately 20 video's (FHWA LPA Essentials @ <http://www.fhwa.dot.gov/federal-aidessentials/>) related to peds/ADA work zones. Lewis to pass on to FHWA HQ's ADA – design group as well as safety- MUTCD section. Section members send any additional suggestions to **Lead: Rob/Mark C/Jeff**

Possible PRESENTATIONS for SOC Conference in 2017

- 1) A panel to present and/or discuss their experiences with ENV programmatic agreements. Also, possible local presentation.
- 2) Recycle and reuse of materials – sustainability & appropriate application of crushed concrete.
- 3) Reuse of crumb rubber and RAS.
- 4) Audited by EPA lately? Have someone from EPA come in and give ppt and / or create panel. Panel members: EPA, ECEE, FHWA, DOT with delegated NEPA.
- 5) Domestic Scan on Training by DOT's.
- 6) NCHRP 685 – Strategies to Attract and Maintain a Suitable Transportation Workforce and NCHRP 813 – A Guide to Agency Wide Knowledge Management.
- 7) Update by Old Castle along with results of State query to see if any have used it with how it has been used.
- 8) OSHA on their program. BMPs, etc.
- 9) TC3 update – Darby Clayton (WV)

Dates and Locations of Future Committee Meetings:

Monthly Status Teleconference Meetings are being initiated **starting November 9th, 2016.**

EHR Section Monthly CONFERENCE CALL schedule:

Once a month (week before officer's mtg.) (IE, 2nd Wednesday of each month – start in NOV, as the following week (3rd Wednesday of each month) the larger AASHTO-SOC has their CALL. Invite appointment and reminder to be sent out by Lewis.

OPTION: If you have a presentation, make it a webinar (IE, draft presentation with the group) but let Lewis know.

Call-in info (and URL) for next AASHTO-SOC SEWD Section mtg. to be held on 2nd Wednesday of every month.

Call in number: 888-363-4749

Access Code for participants: 2737683

URL<https://connectdot.connectsolutions.com/aashtoehr/>

Start time is 8:00AM – (PST).....aka - 11:00AM (EST), roughly 1 to 1 ½ hours depending on discussion.

State	Name	Title	Address	Phone	E-mail	SOC Special Assignments
UT SOC Member	Rob Wight	Director of Construction and Materials	4501 South 2700 West Salt Lake City, UT 84129	WK 801-633-6252	rwight@utah.gov	
MI SOC Member	Mark Chaput	Deputy Director Bureau of Field Services	6333 Old Lansing Road Lansing, MI 48917	WK 517-322-3331	chaputm@michigan.gov	
WV SOC Member	Darby Clayton	Regional Engineer	1900 Kanawha Blvd E Charleston, WV 25301	WK 304-558-3304	J.Darby.Clayton@wv.gov	
DC SOC Member	Paul Hoffman	Program Manager		WK 202-671-4696	paul.hoffman@dc.gov	
NV SOC Member	Sharon Foerschler	Chief Construction Engineer		WK 775-888-7228	sfoerschler@dot.state.nv.us	
TX SOC Member	Tracy Cain	Director Construction Division			tracy.cain@txdot.gov	
NDOR SOC Member	Jim Knott	State Construction Engineer		WK 402-479-4535	Jim.Knott@Nebraska.gov	
ID	John Bilderback			WK 208-334-8426	John.bilderback@itd.idaho.gov	
AR	Bruce Street	Dist. 5 ENGR.		WK 870-307-5229	bruce.street@ahtd.ar.gov	
AR	Deric Wyatt	Dist. 2 ENGR.		WK 870-534-1612	deric.wyatt@ahtd.ar.gov	
NE	Tom Goodbarn	D-1 Engr.			thomas.goodbarn@nebraska.gov	

State	Name	Title	Address	Phone	E-mail	SOC Special Assignments
	Russell W. Lenz	Senior Vice President & COO	7700 Chevy Chase Drive Austin, TX 78752	WK 512-925-4473	RLENZ@rkci.com	
	Chip Hollis	Director, Communications NICET			chollis@nicet.org	
	Bob Lutz	AMRL		WK 717-404-9474	RLUTZ@AMRL.net	
AL	Wesley Zech	Auburn University		WK 716-228-4929	zechwes@auburn.edu	
	Mike Clark	Chief Operating Executive NICET		WK 703-548-1578 X105	Mclark@nicet.org	
KY	Tim Taylor	Associate Professor		WK 859-323-3680	Tim.taylor@uky.edu	
	Eugene Sobecki	ACROW Bridge		WK 201-310-9034	ESOBECKI@ACROW.com	
FHWA Resource Center	Jeff Lewis	Construction and Contract Administration	650 Capitol Mall Suite 4-100 Sacramento, CA 95811	WK 916-498-5035	Jeff.lewis@dot.gov	FHWA Liaison Secretary

Appendix J

Research Steering Committee Report

**AASHTO Subcommittee on Construction
Research Steering Committee
2016 Meeting Minutes
Big Sky, Montana**

Action Items are in Bold.

The 2016 meeting of the AASHTO Subcommittee on Construction (SOC) Research Steering Committee (RSC) was convened at 6:35am on August 16, 2016 in Big Sky, Montana. Those in attendance are listed at the end of the minutes as Attachment 1. The Chair, Charlie Bauer (Wyoming DOT), began the meeting by welcoming everyone and informing the group that he has taken over as Chair of the Research Steering Committee. He then asked for self- introductions.

The Chair then updated the group on how the problem statements submitted last year fared. The following four projects were successfully funded:

- NCHRP Research Program
 - Guidebook for Implementing Constructability Across The Entire Project Development Process: NEPA to Final Design will be NCHRP 10-99.
 - Guidebook For Implementing Alternative Technical Concepts Into All Types Of Highway Project Delivery Methods 08-112
- NCHRP 20-05 (Synthesis Program)
 - Optimal Staffing Levels for Various Project Delivery Methods - Topic 48-04
 - Best Practices in 2- way, 2- lane traffic control - Topic 48-11

Technical Section Research Suggestions

The technical section vice chairs/representatives reported on the research topics identified during the SOC technical sections meetings that were held the afternoon of 8/15/16.

Contract Administration Section – Richard Duval (FHWA)

The group discussed one topic and then also went through 10 topics given to them from TRB’s AFH10 – Construction Management Committee.

- Guidebook for Estimating Contract Time and Evaluating Accuracy - Develop a guidebook that agencies can use to establish a systematic approach to estimating contract time through the application of various estimating techniques according to project characteristics and risk and inclusive of a process for evaluating and improving the accuracy of the approaches used. Guidance would also include contract time estimate techniques for projects procured via alternative contracting methods. This project would be a follow up to NCHRP Synthesis Topic 47-09, “Practices for Establishing Contract Completion Dates for Highway Projects”. The Roadways and Structures section also discussed this. An aspect of this is plugging in environmental constraints. Montana DOT just awarded a project to develop a tool on production based scheduling.
- The 10 projects submitted from TRB/academia are as follows. Some of these are more appropriate for other SOC tech sections and they are so noted.
 - Standard Practices for Use of Mobile IT Devices in Construction – Identify best practices, recommend strategies, and develop a return on investment methodology for standardization of mobile IT devices on highway construction projects. This could have some overlap with the FHWA project documenting the ROI of e-construction, though this is more narrowly focused on various

devices. The Integrated Construction & Technologies tech section may want to consider. Tom Ravn, representing the Integrated Construction & Technologies tech section stated they would like to first assess what technologies States are using and what are they doing. NCHRP Synthesis 46-06, "Use of Mobile Information Technology Devices in the Field for Design, Construction and Asset Management" did some of this – device selection, but there is still the need for the ROI component. Perhaps conduct a synthesis first on what's happening. In some States, connectivity is an issue. It may be better to focus on the data sharing aspect as opposed to the devices. In other words, focus on the information agencies would obtain.

- A Guidebook on the Impact of Accelerated Construction Methods and Technologies for Transportation Infrastructure – Develop a guide to effectively evaluate the various accelerated construction methods and technologies. This may overlap with work FHWA is funding at the University of Colorado Boulder that will be presented later this morning. This would update a previous synthesis with current ACM practices. May be good to look at variations of the theme. A synthesis on different contract aspects and why they are the way they are would be of value.
- A Guide to Automate Project Progress Control by Leveraging LiDAR and 3D/4D Information Models – Automate progress tracking of transportation projects, bridge construction projects in particular, by leveraging 3D LiDAR point clouds and 4D information models. Basically this would look at taking 3D models and developing as-builts. Not many are doing this. Defer this to the Integrated Construction & Technologies tech section. Tom Ravn, representing the Integrated Construction & Technologies tech section felt it may be too early for this project.
- Material Tracking in the Transportation Construction Industry – Research the advancements in tracking technologies and use them in construction industry through pilot projects. FHWA has done research on using RFIDs for material tracking, but this effort is broader than just RFID. Katherine Holtz of TXDOT offered to help refine. Defer this to the Integrated Construction & Technologies tech section. The Integrated Construction & Technologies tech section discussed e-ticketing.
- Streamlining the Data Management Process across Entities, Phases, Locations, and Time – Recommend strategies for documenting, organizing, and managing data throughout the project development process. It is probably more a framework than a guidebook. It would apply to either paper or electronic data. A pressing need is what data should be collected. TRB's subcommittee on CIM has come up with similar projects. The exchange of data between owner and contractor is of interest. Defer this to the Integrated Construction & Technologies tech section, though it may be too early. There's a need to figure out what you need to collect.
- Guidebook on Agency Staffing Levels for Alternative Delivery on Transportation Projects - This is being address by a new NCHRP Synthesis project, Topic 48-04, "Staffing for Alternative Contracting Methods".
- Comparative Evaluation of Alternative Financing Costs and Benefits for Complex Transportation Projects – SHRP2 R10 may be addressing. This is not really an SOC and may be more appropriate for the Standing Committee on Highways.
- Recruiting, Retaining, and Promoting for Construction Careers at the Transportation Agency – Defer to Safety, Environmental and Workforce Development tech section, who did discuss this topic in their meeting.
- Effective Practices of Incentives/Disincentives to Reduce the Time to Complete Transportation Projects – This is being covered in the FHWA project with the University of Colorado Boulder. Consider updating this to examine how people are calculating the B part of A+B contracts.
- How to Integrate and Enhance Existing Project Management Systems in Managing Construction Field Data for Different Project Delivery Methods - NCHRP 08-104, "A Guidebook for Post-Award Contract Administration for Highway Projects Delivered Using Alternative Contracting Methods" is about to be awarded. Enhancing Site Manager is not research.

- Synthesis of factors (Pre and Post Qualifications) to consider in determining whether a contractor is a responsible firm

Roadways and Structures Section – Marc Mastronardi (Georgia DOT)

Work zone law enforcement – state of the practice. This was their top priority. Examine the effectiveness of just having a law enforcement presence vs. conducting enforcement. WSDOT did a study on this and it was previously presenting about five years ago. May want to follow up on that. Conduct a synthesis to see what has happened since. Include quantification of the effects on accidents.

They also discussed needs for 3D modeling in terms of data sharing. They may do a survey first on what are we doing for grade control. Another topic they repeated discuss but that does rise high on their list of priorities is blending fineness in cement.

Integrated Construction & Technologies Section – Tom Ravn (Minnesota DOT)

They didn't really discuss research but Tom will digest the topics above that their group may want to consider on Thursday.

Safety, Environmental and Workforce Development – Rob Wight (Utah Department of Transportation)

They discussed the topic of managing workload – assessing when to hire vs outsourcing, if you have the choice. Also, best practices for getting people up to speed. NCHRP 20-107, “Effective Construction Project Staffing Strategies for Transportation Agencies” is about to start and is related.

Another topic discussed was insurance requirements for projects and what are the risks. Should certain components be separated out? This may be a good 20-07 project. How do agencies make decisions on what they require? How to analyze insurance policies and what questions should be asked. Doug Gransberg offer to help write it up. This may fit better under the Contract Administration tech section.

Katherine Holtz put forward the following synthesis topics from the TRB Quality Committee:

- Synthesis of various manuals, processes and procedures from various states for Quality Management of QAP 10-83 already did
- Identify the difference in standards that work is completed to if delivered through Design Bid Build vs. Design Build - Are we getting longer life? What standards to use? Are there differences in quality?
- Synthesis on workmanship quality requirements- Inspection plans based on risk and schedule - NCHRP 10-92, “Optimizing the Risk and Cost of Materials QA Programs” may have addressed this need.
- Quality Requirements in Procurement Documents and Contract - Procurement documents to manage quality. Non-compliance points for quality. FHWA has developed some work on prequalification. – This seems more appropriate for the Subcommittee on Design.

The Research Steering Committee will reconvene at 5:15 pm on Thursday, 8/18/16 after the tech sections have had a chance to discuss the topics proposed above.

The meeting of the Research Steering Committee was adjourned at 7:50am.

On Thursday, August 18, 2016 the Research Steering Committee reconvened.

The Chair asked the technical section representatives to discuss what research topics discussed at the Tuesday meeting rose as priorities from each of their groups:

Contract Administration (Richard Duval):

The Contract Administration tech section identified three topics, two of which would be full NCHRP research projects and the other would be an NCHRP synthesis:

NCHRP research:

1. Streamlining the Data Management Process across Entities, Phases, Locations, and Time – This would be a framework for standardization. It could include the visualizing of unit prices as presented by Iowa State yesterday. Since this would address both paper and electronic documents, **it should be coordinated with the Integrated Construction & Technologies tech section.**
2. Estimating contract time – The project would be a follow up to NCHRP Synthesis Topic 47-09, “Practices for Establishing Contract Completion Dates for Highway Projects”

Synthesis Project:

Analyzing insurance requirements – Safety, Environmental and Workforce Development tech section identified this topic which Contract Administration also supports.

Roadways & Structures (Marc Mastronardi):

Roadways and Structures would like to advance the topic of workzone law enforcement. They would like a state of the practice that covers items such as how it is contracted, what reporting requirements are used, and cost. This would be done as a synthesis project.

Roadways and Structures could also support the other topics mentioned.

Safety, Environment and Human Resources Section (Rob Wight):

Safety, Environment and Human Resources would like to advance the synthesis on insurance requirements.

Integrated Construction & Technologies Section (Tom Ravn):

The Integrated Construction & Technologies tech section had two items they’d like to advance. First, they support a proposed domestic scan on the use of unmanned aerial vehicles. This proposed scan is being supported by the AASHTO Subcommittee on Maintenance as well, and is attached to this document as Attachment 2.

They would also like to advance an NCHRP research project on the use of 2D vs. 3D. How are agencies using 3D information, what are the files, who is using them?

There was some discussion by the group on whether some of these projects could be done as pooled fund studies, particularly if they are not successful in receiving NCHRP funding. Pooled fund, TPF-5(260), Next-Generation transportation Construction Management, being led by Colorado DOT could be an option. If so, additional funds would need to be added to the pooled fund. Keith Platte offered to announce the pooled fund, if Paul Goodrum sends him something on it.

The NCHRP 20-7 could be an option for the insurance project. The 20-7 program is for quick hitting, small projects of less than \$100k that support the work of AASHTO committees. They have a shorter timeframe of 9 to 18 months. Unlike synthesis projects, they can include analysis of what agencies are doing. **The group agreed that the insurance project should be submitted to the 20-7 program.** The following individuals offered to help prepare the problem statement: **Doug Gransberg (Iowa State University), Anthony Sprague (AK) Michelle Page (UT) Jerry Yakowenko (FHWA)** The deadline NCHRP 20-7 is October 22nd. Problem statements are submitted at: <http://web.transportation.org/nchrp/20-7/>

The group also decided the SOC would submit three topics to the NCHRP research program. They prioritized the topics as follows and individuals were identified who would help develop the research needs statements:

1. Data streamlining/standardization framework – **It may be possible to have AASHTO’s Asset Management subcommittee to co-sponsor this. Keith Platte will approach them.** A related research needs statement developed by TRB’s ABJ95 Sub-committee on CIM is attached as Attachment 3. **Doug Gransberg (Iowa State University), Rob Wright (UT), Katherine Holtz (TX), Mark Rolfe (CT), Sue Eiseman (KS), Paul Goodrum (University of Colorado) agreed to work on this.**
2. Contract time – **Tim Taylor (University of Kentucky), Jason Humphrey (SD) Lamar Sylvester (NC) agreed to work on this.**
3. 2D to 3D - **It may be possible for the AASHTO Subcommittee on Design to co-sponsor this project. Keith Platte will pursue this. Tom Ravn will go back to the Integrated Construction & Technologies Section seek volunteers to develop this research needs statement. Richard Duval (FHWA) agreed to help.**

The deadline to submit Research Needs Statements to NCHRP is 10/14/16. In order for the SOC to submit them by this deadline, **send the Research Needs Statements to Charlie Bauer by 10/7/16. Charlie will submit them on behalf of the SOC at <https://www.surveygizmo.com/s3/2876536/ae1164a9ac0f>.**

The following synthesis problem statement will be developed:

Synthesis on workzone law enforcement – **Marc Mastronardi (GA) to take lead on developing this with Doug Gransberg (Iowa State University) to help.** Synthesis topics are due 2/15/17 and can be submitted by anyone to <http://www.trb.org/SynthesisPrograms/SynthesisProposalForm.aspx>. Note, it is also possible to submit a synthesis topic to the NCHRP research program, and have AASHTO’s Subcommittee on Research (SCOR) refer it to the synthesis program. These generally carry more weight in the synthesis selection process. If it takes this route, **the synthesis research needs statement would be sent to Charlie Bauer by 10/7/16 so that he can include it in the SOC submittal to NCHRP.**

The meeting adjourned at 6:00 pm.

ATTENDEES

NAME	AGENCY	PHONE	E-MAIL
Katherine Petros	FHWA	202-493-3154	<u>Katherine.Petros@dot.gov</u>
Charlie Bauer	WY DOT	307-777-4927	<u>Charlie.bauer@wyo.gov</u>
Tom Ravn	Minnesota DOT	651-366-4228	<u>Tom.ravn@state.mn.us</u>
Marc Mastronardi	Georgia DOT	404-631-1970	<u>mmastronardi@dot.ga.gov</u>
Rob Wight	Utah DOT	801-633-6252	<u>rwight@utah.gov</u>
Richard Duval	FHWA	202-493-3365	<u>Richard.duval@dot.gov</u>
Doug Gransberg	Iowa State University	405-503-3393	<u>dgran@iastate.edu</u>
Roy Sturgill	University of Kentucky	859-312-1259	<u>Roy.sturgill@uky.edu</u>
Chris Harper	LSU	225-578-0131	<u>charper@lsu.edu</u>
Tim Taylor	University of Kentucky	859-323-3680	<u>tim.taylor@uky.edu</u>
Katherine Holtz	TXDOT	512-201-3612	<u>Katherine.holtz@txdot.gov</u>
David Reynaud	NCHRP	202-334-1695	<u>dreynaud@nas.edu</u>



ATTACHMENT 2

Domestic Scan Proposal Form

AASHTO is now soliciting proposals for a **Calendar Year 2017 US Domestic Scan Program** (NCHRP Panel 20-68A).

Selected scan topics will be investigated by one of three ways: (type 1) site visits to three to six locations for approximately a two week period or less, by webinar; (type 2) peer exchange; or (type 3) conducted by a group of eight to 12 transportation professionals with expertise in the selected topic area. Proposed topics should meet the following criteria:

- Address an important and timely need for information by transportation agencies;
- Are of interest to a broad national spectrum of people and agencies;
- Are complex and also “hands-on,” meaning they lend themselves particularly well to exploration through on-site visits; and
- Are sufficiently focused that the tour participants are able to investigate and understand key issues in the limited time available on the tour.

Before submitting your proposal it is highly recommended that you read [What Makes a Good Scan Topic Proposal](http://www.domesticscan.org/what-makes-a-good-scan-topic-proposal) <http://www.domesticscan.org/what-makes-a-good-scan-topic-proposal>

This form is designed to collect the full length of your proposal. Sections requiring essays have unlimited space for you to use. Contact information has some limited text. **Use your TAB→ key to advance to the area where you need to complete information.**

Proposals should be returned no later than OCTOBER 15, 2016.

IMPORTANT NOTE on How to save your document: *LastNameFirst Initial, underscore Organization Acronym _CY2017.*
Saved Document Name Example: *VitaleM_AASHTO_CY2017*
If you have more than one, add a number after first initial: *VitaleM1_AASHTO_CY2017*

Domestic Scan Proposal Contact Information

Name	Bryan Cawley	Address	Room E75-334 1200 New Jersey Avenue, SE Washington DC 20590
Title	Construction Management Team Leader	E-mail	bryan.cawley@dot.gov
Member Department AASHTO Committee	FHWA Subcommittee on Maintenance and Subcommittee on Construction	Telephone number Date of submission	202-366-1333

Title of Proposed Scan: UAV In Highway Construction And Maintenance

Problem Statement (What topic is to be examined? What drives the need for the scan? Why now?)

The use of quadcopters and drones is not just for military and hobbyists anymore. Over the past 3 years we have seen an increased usage of these devices in the construction industry. We have seen these devices controlled remotely and autonomously. They have been carrying numerous devices such as HD cameras, HD video cameras, LiDAR imaging equipment, and more. Contractors, Owners, and Consultants are using these devices to assist them in day to day operations as well as researching future

uses. The increase use of these devices is beginning to spread. Based on a recent AASHTO survey at least 19 different State DOT are exploring the use of the equipment. We have a unique opportunity now, to shape the way they are to be used in the future. Because of its semi-regulated use, a team of uniquely trained professionals should identify and study closely its current application and use to ensure a successful national accelerated implementation. Timing for this scan is ideal to record initial investments, long-term and short-term plans of agencies, disposition of data collected, what devices work better under different environmental conditions, and other important practical assessments.

Scan Scope (What specific subject areas are to be examined? Which cities and states might be visited? Which agencies/organizations (including specific departments or types of staff if applicable)?

This domestic scan will focus on obtaining information of key indicators of successful use and implementation of this device.

Purpose: The purpose of this domestic scan will be to visit the users of this technology and document their use (inspection, inventory, survey, or other) and document why, how, and where they are using this technology, along with the way the data is being stored and used.

Control Method: What control method is being used (remote control or autonomous).

Attached devices: HD cameras, video cameras, LiDAR, or other devices

Owner/Operator: Government agencies, Contractors, Consultants, and/or Universities

Based upon the recently completed AASHTO survey, the following are possible State DOT that should be considered for this visit: Connecticut, Delaware, Florida, Idaho, Indiana, Kentucky, Minnesota, Michigan, Oregon, South Carolina, Vermont, or Washington State. We should conduct a detail survey of these leaders to more effectively identify where the scan should visit. During our visits, we would like to visit with the State DOT Surveying, photography, construction and maintenance departments to assess their involvement in the use of these devices as well as the data they are collecting and using.

Anticipated Scan Results (What key information is to be gained? What information is to be shared after the scan? Who would the audience be for this information?)

The anticipated information to be collected during this scan shall include but not limited to device model, weight, initial cost, maintenance costs, added data collectors; HD cameras, HD video cameras, LiDAR imaging equipment or others. The scan shall also look at identification of data format, storage and handling, data ownership, specifications for its use, request for proposals, as well as others identified during the course of the scan. It is anticipated that all of this data will be made available in the final report of the scan. The scan will also look at operator credentials, certifications, or licensing to operate the equipment. The anticipated audience for this information could be contractors, state DOT personnel (construction, inspection, material testing personnel, field inspectors, quality assurance/ quality control officers and others).

Benefits Expected (Including potential impacts on current technology or procedures)

The scan focus and objectives shall provide a national understanding of the proactive use of this technology as well as the return on investment and its benefits. This scan and its report will assist the accelerated national deployment of the technology. The scan will also provide valuable information concerning where additional development and research might be needed to support the increased use of this technology.

TRB's ABJ95 Sub-committee on CIM Research Needs Statement

GUIDANCE FOR DIGITAL DATA EXCHANGE AND BEST PRACTICES TO SUPPORT CIVIL INFRASTRUCTURE PROJECT DELIVERY

BACKGROUND

Effective digital project delivery requires appropriate technologies, tools, and best practices that can accelerate and enhance the detail and accuracy of project designs, accelerate construction, reduce construction costs, and facilitate management of the transportation infrastructure throughout its lifecycle.

Limitations of plan views, profiles, and cross sections in traditional 2D project files include (a) the need for multiple views to depict real-world objects in adequate detail; (b) lack of connectivity between different elements within the views, making edits more difficult and increasing the risk of errors and redundancy; and (c) difficulty associating attribute data with graphical features. Although the CAD files might appear to contain all the necessary information, a close analysis reveals problems such as overlapping or disconnected graphical elements, inconsistent use of levels or design libraries, inconsistent use of file naming and folder structure conventions, and inability to link business process databases to features in the files.

Implementing effective digital project delivery applications is hampered by the lack of robust data exchange business practices and standards. Categories of data exchange issues include, but are not limited to, the following:

- Data content issues (e.g., data inside files and databases).
- Data management issues (e.g., file structure and file naming conventions, data storage, and permissions).
- Spatial and temporal issues, not just during project development and delivery but also throughout the entire lifecycle of a transportation facility (e.g., varying levels of data detail, completeness, and accuracy requirements from planning to preliminary design, design, construction, and post-construction).
- Business process issues (e.g., varying data requirements by different users of the data for applications such as project management, data certification and verification, surveying, information modeling, detection and management of utilities, and production and maintenance of as-built records).
- Technology compatibility issues involving 2D, 3D, CAD, GIS, BIM, and CIM. For example, over the years, it has been possible to exchange 2D and 3D data in a variety of formats. Support for extensible markup language (XML) to export data is increasing; however, data interoperability and efficiencies issues require addressing.

OBJECTIVE

The purpose of the research is to develop a compendium of best practices and a guidance manual for conducting digital data exchange effectively both throughout project development and delivery and during the lifetime of transportation facilities. The research will examine geospatial and non-spatial data requirements as well as

relevant business processes, including, but not limited to, project management, data certification, surveying, information modeling, real-time verification, detection and management of utilities, production and maintenance of as-built records, and asset management. The research will also examine data content and data management issues as well as technology compatibility issues.

POTENTIAL BENEFITS

Anticipated benefits include, but are not limited to, the following:

- More effective digital data management practices at transportation agencies and other organizations.
- Substantial reduction or elimination of unnecessary silos of information that discourage or preclude the implementation of robust data management practices.
- Standardization of data practices.
- Simplification of the process to collect, assemble, and exchange data throughout project development process and delivery.
- More effective maintenance and operations practices resulting from a tighter integration between as-built documentation and relevant operational and maintenance activities.

RELATIONSHIPS TO THE EXISTING BODY OF KNOWLEGE

- XML development efforts include the following: LandXML, ifcXML, InfraGML, PipelineML, 3D Information Management (3DIM) Domain Working Group, agcXML, CityGML, and TransXML.
- Utility data mapping standard development efforts include ASCE/CI 38-02 and Canadian Standards Association (CSA) S250-11.
- Utility research initiatives include SHRP 2 R01A and R15B/R15C.
- FHWA Bridge Information Modeling (BrIM) Standardization report.
- WSDOT's research report on LIDAR for Data Efficiency.
- NCHRP 15-44, Guidelines for the Use of Mobile Lidar in Transportation Applications.
- NCHRP 10-96, Guide for Civil Integrated Management (CIM) in Departments of Transportation.
- NIBS buildingSMARTalliance, AIA/CSS/NIBS National CAD standards (NCS), NIBS National BIM standards (NBIMS)-US, and NIBS COBie.
- EUBIM Congress of International BIM Industry Alliance for Interoperability.
- BS ISO 16757-1:2015.
- UK BS1192:2007, PAS1192-2:2013, PAS1192-3:2014, BS1192-4:2014, and BS1192-5:2015 ISO 12911:2012, ISO 29481-1:2013 and ISO 16739:2013 (IFC).
- ANSI/BICSC 003-2014.
- OGC LandInfra Model.
- FGDC Standards Reference Model, Geographic Information Framework Data Standard (XML), Address Data Standard (XML), and Content Standard for Digital Geographic Metadata.

TASKS

The phase descriptions below are intended to provide a framework for conducting the research. Proposers are expected to describe a research effort that can realistically be accomplished within the constraints of available funds and contract time. Proposals must present the proposers' current thinking in sufficient detail to demonstrate their understanding of the problem and the soundness of their approach for accomplishing the project objective. The work proposed for each phase must be divided into tasks, and proposers must describe in detail the work proposed in each task.

PHASE I. The purpose of Phase I is to develop a compendium of practices for conducting digital data exchange throughout project development and delivery and during the lifetime of transportation facilities. The research should examine geospatial and non-spatial data requirements taking into consideration typical business processes that involve digital data exchange activities, including, but not limited to, project management, data certification,

surveying, information modeling, real-time verification, detection and management of utilities, production and maintenance of as-built records, and asset management. The research should also examine data content issues (e.g., related to data inside files and databases), data management issues (e.g., related to file structure and file naming conventions, data storage, and permissions), and technology compatibility issues. The research should examine case studies to capture both the current practice as well as examples of best practices. The research should also conduct a review of applicable data standard formats and data exchange standards, and examine the need for potential changes or updates to appropriate data exchange standards. The deliverables should include a Phase I report providing (a) an executive summary overview; (b) documentation of the results of the analysis; (c) a draft outline for a guidance manual; and (d) an updated work plan for Phase II.

PHASE II. The purpose of Phase II is to develop a guidance manual for conducting digital data exchange effectively both throughout project development and delivery and during the lifetime of transportation facilities. Phase II deliverables should also include a final report that (a) documents the entire project, incorporating all other specified deliverable products of the research, and (b) provides an executive summary overview that outlines the research results. Note: Following receipt of the preliminary Phase II deliverables, the remaining 3 months shall be for NCHRP review and comment and for research agency preparation of the revised final deliverables. Even though the work for Phase II is dependent on the work plan developed in Phase I, proposers should present their current thinking on plans for Phase II in their proposal.

FOLLOW-UP AND IMPLEMENTATION ACTIVITIES

The research has significant potential for changing data collection and maintenance practices at transportation agencies nationwide. It is also highly relevant for the development, implementation, and maintenance of a number of relevant data exchange standards. Research implementation success will therefore require active participation and leadership by NCHRP, FHWA, DOTs, AASHTO, trade organizations (e.g., engineers, consultants, and contractors), software vendors (e.g., CAD, GIS, BIM, CIM, and VDC), and data standards organizations to adopt the recommendations and business practices resulting from the research.

Implementation will likely require seed funding to (a) promote the research findings at venues such as conferences, events, and data standard committee meetings; (b) engage champions to generate momentum needed to develop and/or adopt new or updated data exchange standards; and (c) promote pilot implementations throughout the country using proof-of-concept pilots, lead adopter incentives, or user incentives.

ESTIMATED FUNDING REQUIREMENTS

Estimated funding need: \$300,000-500,000

Anticipated project duration: 24 months.

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Appendix K

SOC Resolutions

TITLE:

**AASHTO SUBCOMMITTEE ON CONSTRUCTION
RECOGNIZING THE
MONTANA DEPARTMENT OF
TRANSPORTATION,
HOST OF THE 2016 AASHTO SOC
SUMMER MEETING IN BIG SKY, MT**

AASHTO Subcommittee on Construction (SOC)
Recognizing the Montana Department of Transportation
Host of the 2016 AASHTO SOC Summer Meeting in Big Sky, Montana

WHEREAS, The AASHTO SOC met in Big Sky, Montana, August 14 through August 19, 2016; and

WHEREAS, SOC members from the states, FHWA and industry partners were greeted with hospitality by Montana Transportation Department State Construction Engineer, Kevin Christensen and members of his extremely competent and friendly staff...; and

WHEREAS, the SOC members were taken on an enthralling and entertaining journey through the 144-year history of Yellowstone National Park by Park Ranger Jim Evanoff....; and

WHEREAS, the SOC met and successfully discussed highway construction business and technical issues such as the similarities between rocket science and real time traffic management, the safety of all our customers, the future of e-Construction, and Drone (aka UAVs) usage on construction projects...; and

WHEREAS, the SOC members engaged in enlightening and informative discussions of topics raised by members benefiting all that participated....; and

WHEREAS, the SOC members had the tremendous honor of bearing witness to the recognition of C.O. Gransberg, long time Montanan and retired Montana Road Department employee for his service to his country and this department; and

WHEREAS, the SOC members were amazed by the Montana Transportation Department skill in the use of on-demand wildlife for lunchtime entertainment....; and

WHEREAS, the SOC dispersed teams of engineers to inspect the Lone Peak Tram and attend the 57th anniversary of Earthquake Lake....; and

WHEREAS, the SOC was treated to an outstanding dinner banquet to wrap up the wonderful week of meetings, education, friendship, and fellowship...; and

THEREFORE BE IT *RESOLVED*, that the participants of the 2016 SOC have thoroughly enjoyed their stay, appreciated the commitment and dedication of the Montana Transportation Department staff, and offer its thanks for a successful conference..., and

BE IT FURTHER *RESOLVED*, that the AASHTO SOC members have established an effective date of this resolution of August 18, 2016 at the SOC summer meeting in Big Sky, Montana.