

**AASHTO Subcommittee on Maintenance  
Technical Working Group Breakout Session Minutes  
Clark County, NV – July 2016**

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**AASHTO SCOM Bridge Technical Working Group**

**Afternoon Breakout Session 7/18/16 @1:00-3:00**

Jeff Milton introduced himself as TWG chair, and welcomed all to meeting.

Self-introductions were made all around and sign-in sheets were circulated. With a show of hands, it was apparent that there were many non-bridge professionals in attendance

Mr. Milton indicated that there may be meetings outside of those scheduled in agenda

Mr. Milton went over agenda, and discussed coordination with AASHTO subcommittee on bridges, describing a good working relationship between SCOB and SCOM. He explained that the SCOM strategic plan was now updated. He also gave the Bridge TWG attendance statistic from last year's SCOM: 36 attended Bridge SCOM sessions.

First on agenda, Mr. Milton proceeded with his presentation:

**Bridge TWG Work Plan:** Jeff went over the 2016 Work Plan, summarizing the various activities: continued working with TSP2, FHWA BPETG, supported AASHTO TC3 (Transportation Curriculum Coordination Council), liaised and facilitated collaboration between bridge preservation partnership and AASHTO SCOM leadership. (Elaborated on the TC3, describing how it started in 2001 as a pooled fund. It is now comprised of 30-state members that develop web-based courses, and contributing states get free training. TC3 strategic focus areas: workforce development and retention.) Mr. Milton continued with the work plan by going over TWG support of the various bridge preservation entities. He said this TWG also updated strategic plan, provided research statement, encouraged implementation plans,

reviewed research proposal statements from other committees, and supported NCHRP research projects.

**Asset Management:** The following was accomplished by the TWG: monitored FHWA ruling, and helped define “state of good repair”. Mr. Milton then discussed strategic focus areas, but “safety first” is overriding goal.

**Training:** Mr. Milton went over FHWA training courses developed, and described how the NHI bridge maintenance course is revamped including a combined 4-day in-person and web-based training, and a 100-page maintenance manual.

**Research:** The research for proposal for 20-07 project went through. Resolution 2013 formalized organizational relationships between TSP2 and regional partnerships. A new domestic scan 15-03, with 2 hour presentations each about their bridge coatings, will be completed in October 2016. New research project NCHRP 12-108 is beginning, and Jeff Milton is chair. Four national working groups: coatings, deck preservation, social media, specifications. It was proposed to have national research group. There is a working group on joints—focused on western regions, but open to all. Mr. Milton briefly discussed the FHWA Preservation portal, pooled fund, TAC established, defect action and cost.

David Miller, TWG co-chair, commented on his work as liaison to SCOBs, describing that there is about 90% overlap between groups. Generally, there is a need for volunteers for additional liaison work. Will go over what it means to be liaison, provide outline.

Steve Cook co-chair commented: If you (attendees) want more involvement, ask Jeff. Jeff does excellent job. Steve is liaison to TSML.

Mr. Milton moved on to RESEARCH project discussion. There are two problem statements to discuss:

1) “Effective use of duplex coatings to improve steel bridge structural durability”; this would be approximately 3 years and cost around \$500,000. This project statement has been formally endorsed by SCOBs T9. Jeff asked for a formal endorsement from the group on Thursday at the SCOM business meeting. Jeff briefly explained duplex coatings, where steel is galvanized/metalized then painted with a topcoat. David Miller commented that the way the problem statement process will work is that when a TWG agrees to endorse the problem statement, it then goes to a vote at the general business meeting. An attendee from the audience discussed the goals of project including specs and guidance, and the fine tuning process with design guidelines. The problem statement focus will be on new and existing bridges. A question from the audience asked: “why design for 100 years when we have trouble with 20-year traffic projections”. General group answer: a 100-year life is an AASHTO goal, and DOTs don’t want to be in position where we have to replace after 20 or 45 years. David Miller: There is a California study as to why bridges are replaced. The trend is that bigger metro areas are replacing due to functionality limitations instead of structural condition. The pending study NCHRP 20-07 looking at why bridges are replaced. The National Steel Bridge Alliance has a task force on specifications for metallizing and hot-dipped galvanizing. Jeff Milton asked the audience for opposition in moving the agenda forward and, hearing non, moved on to the next item.

2) “Determine the cost effectiveness of bridge cleaning and washing measures.” This problem statement was submitted for NCHRP project consideration. In 201, the Bridge TWG had the project, but did not start it because FHWA said it would fund the University of Washington to do the work, but the study ultimately did not do this exact topic. The recommendations of the study were for further research, continuing work done at University of Washington.

David Miller: two issues: 1) getting over the hump with environmental regulations and, 2) and what value is in washing bridges; these two items are unknown. Audience comment: Oregon did some work on this, finding caps and bearing elements need to be washed. Jim Feda commented about the cost effectiveness in terms of individual elements. Within the study, it is the intention that frequency of washing will be looked at, with regional consideration. Audience comment: study should focus on beam ends and bearings, but individual elements need to be called out by themselves. Also, the cleaning language in the study must not imply the use of detergents. David Miller: We should fine tune the problem statement. Jeff Milton asked for opposition, acknowledging that it must be fine-tuned. Audience comment: could LTBP do this? Jeff will talk to Sue Lane tomorrow. Audience question: what have the Europeans done? Audience discussed what their agencies require regarding max pressure, environmental testing, wash water diversion. It was commented that sometimes it is up to individual districts. Some sweep but don't wash. Maine has performance measures for washing, and uses federal funds for washing because it is a preservation activity. Kentucky uses epoxy coated rebar with good results. MnDOT “flushes”. PennDOT contracts and uses pressure 1200psi every other year. A funding discussion followed where it was identified that some FHWA agreements cover preservation, others don't. Most agreed it would be nice to have a national template for what's fundable for maintenance activities because it seems inconsistent from state to state. A resolution was briefly discussed to come up with baseline templates to work with with the goal of defining what is fundable and what isn't. This topic might be a good research project to look at all 50 state PM agreements. Perhaps we can this week compile a list specific issue that the states have with their PM agreements?

**TWG Resolutions:** Jeff Milton asked for ideas, initially hearing none. Jeff brought a draft that Jameela Hayes provided for a SCOM-wide resolution to review and update the NHI Maintenance Leadership Academy course. Steve Lund believes there is general support for this across the TWGs. Audience comment: the course really needs updating. Jeff asked if there is opposition, and there was none. Jim Feda commented about the TC3 maintenance competency matrix, and how it needs a couple reviewers to for keeping them up to date, especially training part of matrix—needs reviewers to find gaps, etc. Levels 1, 2, 3 and 4, from maintenance worker up to resident engineer.

Jeff Milton posed the question to the audience: should we include recurring items in annual work plan? The feedback was that there is no harm in leaving the recurring items in the work plan.

Steve Lund commented that SCOM is trying to do better job in liaising with other subcommittees, and that there are groups looking for interested individuals in doing liaison work for SOC, SOM, others.

David Miller: Other subcommittee (SCOBs) paid for liaison attendance. Jeff Milton indicated that the TWG leadership would be available in the current meeting room to meet after break, if there is interest.

Meeting adjourned at 2:58.

### **Non-scheduled Afternoon Session 7/18/16 @3:30-4:45**

Ed Welch played a TSP2 marketing video, describing the four bridge preservation partnerships. The video also talked about PP national conference in 10/2016. The bridge conference is scheduled for 2018, and information may be found at [www.tsp2.org](http://www.tsp2.org). On the website there is a Bridge preservation blog, and Bridge preservation database.

Jeff Milton relayed a message that Sue Lane of the FHWA's LTBP will not be able to attend tomorrow—John Hooks may be able to do a question and answer. Another idea would be to take the time to do a round table on the subject. Regarding a question about funding future research, will leave in SCOM research statements for now.

Jeff Milton moved to use the present meeting time to discuss the 2017 work plan, of which he has the framework slides. Mr. Milton proceeded to go through the proposed 2017 work plan: Safety: Continue from 2016. Not much action on fall protection task force. David Miller suggested AV/CV inclusion under safety. Mr. Milton replied by suggesting: encourage member states to increase worker safety using AV/CV crash cushions, or something like that. David Miller: How about UAV use? Asset Management: Monitor FHWA rulemaking. Continue to promote bridge preservation. Environmental: Essentially continue from last year. Continue support for 2017 project statement. At this point there was some discussion on the topic of pollinators and bats, and recent regulation concerning their habitat in the context of roadside mowing. Work force development: Keep language from 2016. Make information available through TSP2 website. Support TC3 program. (TC3 has virtual demonstrations that show how to use proprietary products.) It was also discussed how there are live demonstrations at both the TSP2 bridge preservation conference and pavement preservation conference.

Meeting adjourned at 4:42.

### **Unscheduled Morning Leadership Session 7/19/16 @10:00-12:00**

Jeff Milton, Steve Cross, Morgan Kessler, and David Miller

The above leadership group discussed and developed the work plan for 2017.

Meeting Adjourned at 11:58.

### **Afternoon Breakout Session 7/19/16 @1:00-2:30**

**Nevada Bridge Statistics:** The first presentation was made by Nancy Kennedy of the Nevada Bridge Division. She is the assistant chief bridge engineer. Nancy gave the statistic: it is the second year in a row that Nevada has the best bridges in nation based on ratio of deficient bridges by ARTBA. She believes this is due to Nevada having the best environmental conditions for bridges. She described Nevada as having 1980 bridges in inventory, and went through their funding environment. Ms. Kennedy described how NDOT does not have formal bridge management system, but they are buying an enterprise system for the state. Bridge Maintenance is done in-house for smaller jobs, and the larger ones are contracted out. Nevada has no formal bridge preservation program, but staff is asking the legislature for additional personnel to cover preservation. Federal required inspections are conducted by two in-house and two consultants. Nevada began element level inspections in 2011, and team leaders are becoming certified to perform tunnel inspections. Nancy described Nevada's challenges as having limited funding and many retiring personnel. For future planning and activities, Nevada will initiate a bridge management system, and prioritize bridge maintenance work with all three districts. Nevada will also develop an emergency response plan for bridge inspection, and establish design policies that promote longevity in new bridge design. There was some discussion of what "state of good repair" means: it appears there is no formal definition so far other than in bridge preservation guide. Jeff asked if there needed to be any more discussion of the definition. There was no input from group.

**Reports from Bridge Preservation Partnerships:** The agenda moved to the item on reports from bridge preservation partnerships:

Northeast: Rich Van Allen chair, retiring from ConnDOT, involved in NE bridge preservation partnership for years. There are twelve member agencies. Rich proceeded to go over NEPP leadership structure, said there are monthly conference calls, and described the completed group projects: small movement joints, and deck joint repair. Future meeting will take place on 9/19-21 at BWI Marriott airport. Ben foster will be new chair, with Nancy Heuther (north Dakota dot) as vice chair.

Midwest: Nancy went over the group's leadership structure, and indicated that they have monthly web meetings with typically 17-20 participants. The group is starting working group leader meetings, and various working group meetings. The Annual meeting will be on 10/3-5 in the Milwaukee, WI, at the Hilton Milwaukee city center. Some activities over the past year included: changed by-laws, elected 5 state directors, sent 2 members to SEBPP, one representative from state to discuss preservation for their state at monthly meetings. Call for presentations for annual meeting. There are several working groups, including social media, outreach to local agencies, systematic preventative maintenance, preservation matrix, deterioration modeling, regional specifications and product evaluation database, bridge preservation research, and annual meeting working group. Nancy then presented the meeting draft agenda.

Southeast: Dan Muller, chair, discussed leadership structure, and talked about their recent meeting in San Antonio TX. Dan also talked about bridge deck preservation, ties between inspection and asset mgmt., preservation of substructures in severe environments, bridge preservation research needs, and discussed operating balance of \$62k. Activities include monthly conference calls, planning of the annual meeting, bridge performance measures, and meeting planning committee. Members participate in many different groups, including national coatings, TSP2 website development, national bridge deck preservation, and performance

specifications. The 2017 meeting will be in WV, followed by the national meeting, then Tennessee 2019. Western partnership: no update.

**TSP2 Update:** Ed Welch of NCPP: Ed explained TSP2 purpose and organization, and talked about what's new. They will be hosting virtual demo 5-minute demos from industry on their website. Case studies are included this year. Other activities include bridge training for local agencies, putting together modules for 1-day course. They are also working on a bridge product and tech database, which will take six months to design and six months to populate. This database involves all four partnerships, and will produce many types of reports. Social media: is social media the answer? Ed then went over future partnership meetings, including the 2018 national meeting. They will be putting committees together to organize the meeting.

**Research Needs Status:** all four partnerships have been working on developing research needs. NCPP is in the process of updating the research roadmap. Research implementation: comment: don't let research sit on shelves. Implementing research makes good case for funding by generation data and buy-in.

**FHWA LTBP:** Sue Lane not present due to extenuating circumstances. John Hooks volunteered to discuss what he knew about the LTBP activities, show some elements of the LTBP, and talk about criteria for bridge inclusion. John discussed the scope of the LTBP, the bridge portal, and what a useful tool it is and how it is free and available to the public. The first version went online last year. The bridge performance high priority topics are untreated PCC decks, treated PCC decks, deck joints, bearings, and superstructure coatings. Mr. Hooks went over data collection approach: candidate bridges, cluster bridges, reference bridges, representative bridges, and deterioration models. Mr. Milton said that Sue has offered to do a webinar to group once she's able. Questions: Kentucky indicated that information requests from LTBP were a bit much for their resources. Nevada indicated that LTBP wanted very detailed information that would take a long time to gather. The group indicated that LTBP is looking for wider amount of data on state bridges. Consensus was to suggest to Sue that this topic be discussed at September meeting.

### **Morning Breakout Session 7/20/16 @8:00-10:00**

Meeting called to order at 8:05

**FHWA HRDI Research and Preservation Portal Projects:** Morgan Kessler provided an update on FHWA HRDI research and the Preservation Portal project.

Ongoing FHWA Research:

- "Effective Use of Geospatial Tools in Highway Construction and Maintenance"
- "Integrating 3D Digital Models into Asset Management"
- "Determining Highway Asset and Data Inclusion in an Asset Management System"

Morgan also mentioned that FHWA is always looking for research opportunities that involve bridge preservation, outside of LTBP activities. For example, the bridge washing cost-benefit problem statement may be a good project to explore as an FHWA-led new project.

Mr. Kessler then summarized a new proposed pooled fund effort titled “Transportation Asset Preservation Portal”. The FHWA lead is Raj Aileny, and the objective of the study is to develop an internet Portal that will provide a repository of State practices for preservation and preventive maintenance actions. The effort will start with bridge maintenance information, later expanded to other assets.

It is envisioned that asset information will be accessible in the context/format of:

- Defect—what is the problem?
- Cause—how did this happen?
- Action—how do we remedy this problem?
- Cost—how much will it cost to fix?

Chris Keegan will be lead, and development of web portal will be contracted. Once the pooled fund is stood up and funded, Washington will solicit for contractor to perform the work. AASHTO SCOBS Update: As liaison, David Miller provided an AASHTO SCOBS update. The host of the annual meeting gets to give overview of bridge preservation program. At the annual meeting in Louisiana, Dan Williams delivered a presentation about avoiding cable-stayed bridge corrosion by using circulated air-conditioned air. Another item discussed was a long term bridge portal talk. The results of the national steel coatings scan are supposed to be published in October.

**Requests for Action (RFA) in Michigan:** Steve Cook gave a presentation on Requests for Action (RFA) in Michigan regarding infrastructure conditions, and these are coded as priority levels of 1, 2, and 3. Level 1 is an emergency, and Michigan has 2 contractors under retainer for immediate use when needed under this severity level. Michigan has a budget of \$320 million for winter maintenance, with \$32M just for salt; these funds also pay for the sometimes very elaborate temporary supports for structures. Michigan has observed the following trends: priority levels 2 and 3 are outpacing repairs. A large part of the effort is keeping up with load ratings, while concrete and steel repairs not being addressed. Priority 2 and 3 work is not in bridge program. The most common causes for priority 1 and 2 are when the defect is a safety issue. The current repair options have a 3-week turnaround time. The funding available is \$1M for state bridge repair crew, \$3M for special needs contracts, and \$10M for bridge Priority preservation fund. Michigan experienced efficiencies in 2015 with new policies and new hires, partnerships with contractors. Michigan uses MiBRIDGE RFA dashboard, which provides a visual on map where temporary supports are in place. Future strategies include focus on repairs, emphasis on expansion joint replacement and pavement relief joints, use of corrosion resistant stirrups, a focus on poor bridges, bridge design to prevent water from reaching beam ends, and whitepaper for bridge inspectors on RFA process, and the hiring of seven regional bridge engineers. There are 100% state dollars in \$320M mentioned earlier. Bridge hits fall under this funding program.

**Roundtable Discussion on UAVs:** Steve Cook facilitated a Roundtable Discussion on UAVs, and kicked off the discussion by talking about Michigan studies (one from last year) on the topic. Steve described the use of cameras, thermal lidar, and vehicles controlled wirelessly from an iPad. The vehicles could operate in up to 20mph winds, and were used to detect surface conditions. UAS’ can generate 3D models, and perform automated spall detection.

Michigan has a panel for UAS' to look at economic impact with a diverse membership (military, state, chamber of commerce, etc.). Currently, Michigan is trying to get a moratorium of UAV use over right-of-ways. They want innovation, but not ready to go full on yet. FAA changed UAV regulations recently, and they take effect in august. There was a question asked regarding human perception/interpretation of seeing a UAV in use nearby—is there any research on this? Michigan is getting a lot of requests from private entities for UAV use. Comment from Wisconsin representative: FAA regulations are backwards—hobbyists are free to do what they want and get in trouble, and professional/commercial users are overly regulated. Audience question: Have you tried snooper-type uses? Mr. Cook: Yes, under decks and in superstructures. Mr. Cook went on to comment that technology is not question—an agency's data needs are the real question. Any RFP needs to explain exactly what is needed, what the outcome will be. Maine presently has a COA, and has had good results with bridge inspection, with very high resolution images. Question: Are law enforcement giving buy-in in Michigan? Mr. Cook answered that in MI, yes. Question: What is the more significant risk--flying over things, or our standard lane closures, etc? Answer: the two most significant risks are motorist distraction and vehicle failure. Hobbyists have to register vehicle if over .55lbs. Good problem statement: what can UAS' do to collect AASHTO elements? What are gaps that need to be filled? There is no COA needed if not in US airspace (such as in pump stations, etc.). ALDOT owns 4 UAVs, with supporting office. Maybe some level of synthesis at NCHRP would be good to see what others are doing. UAV use has potential to automate data gathering and increase transparency with regulations.

Meeting Adjourned at 10:06

### **Unscheduled Morning Meeting 7/20/16 @10:30-11:00**

This session opened with discussion regarding whether or not to develop a new official problem statement regarding the ability of UAS to gather NBI and AASHTO element data. The prospect of a pooled fund project was also discussed, along with how to get this topic moving in terms of direct applicability to bridge inspection. One option is to pitch project at general meeting tomorrow, or pitch domestic scan for an up or down vote at general meeting tomorrow. Pooled fund study may be best approach. Michigan may be best to lead pooled fund study, and SCOM would not need to be involved. (Could our UAV project be expanded to include this). Michigan agreed to initiate this pooled fund effort, with Wisconsin happy to work with MI. SC wants to actively participate as well. The target for duration should be 2.5 years, with multiple phases and interim deliverables. The pooled fund will have a \$500K funding horizon, with possibly 30 states as part of pool. Group agreed to move forward with looking to starting a new pooled fund.

## **AASHTO SCOM Equipment Technical Working Group**

### **July 18, 2016 1:00 to 3:00**

Welcome and introductions; 30 in attendance at this session; Rosters for all meetings are attached separately.

Discussed completed activities for the past year.

#### **NCHRP Projects:**

1. NCHRP Project 13-04, FY2014 - Guide for Optimal Replacement Cycles of Highway Operations Equipment is on-going. The project panel has been staffed; RFP has been written, solicited, evaluated and awarded to a research agency – Dye Management Group, Inc. Project start date was May 01, 2015. The project completion date is April 30, 2017.
2. NCHRP Project 13-05, FY2015 - Guidelines for the Development of Highway Operations Equipment Utilization Measurement and Management is on-going. The project panel has been staffed; RFP has been written, solicited, evaluated and awarded to a research agency – Washington State University. Project start date was 06/01/15. The Project completion date is May 31, 2017.
3. The Equipment TWGS's research problem statement titled Development of an Automated Tool to Assist in the Formulation and Maintenance of Long Range Equipment Replacement Plans was approved funding by SCOR in March. The project panel is being selected and assembled by NCHRP.

#### **EMTSP Update:**

1. Received contributions of \$117,000 from 39 states (76.4%) in Fiscal Year 2016 as of June 30, 2016.
2. Updates to the EMTSP Strategic Plan have been completed, which can be found on the "Administrative" page of the EMTSP website at the following link: <http://www.emtsp.org/about-emtsp/>
3. 2015-2017 EMTSP Work Plan has been updated and can be found on the "Administrative" page of the EMTSP website at the following link: <http://www.emtsp.org/about-emtsp/>

An overview of the 2016 National Joint AASHTO-EMTSP/TRB Fleet Management Conference and Equipment Trade Show was given by Doug Burke.

1. Was hosted by the Ohio DOT on June 27-30
2. 34 states attended
3. Roundtable of topics and presentations
4. Field tour of prison
5. Good conference to attend
6. Next National conference in Connecticut
7. Upcoming Regional meetings - SE – Georgia, NE/Mid-West - Maine, W - California

**TRB Update:**

An overview of the 95th Annual TRB Meeting in Washington D.C. January 10-14, 2016 was given by Lisa Kunzman

1. Discussed old and new AHD 60 research needs
2. Talked about the winter maintenance/Surface transportation Weather conference held in FT. Collins CO. Highlights included On-line presentations, participants viewed prior to attending so face to face discussions could focus on topics and be able to dive into weeds at conference
3. Topics included: Plow lighting, winter equipment maintenance, presentation from University of South Carolina on analytics.

**Current Research Project Update – Cost of Service Analysis:**

1. Discussion on how research needs are outdated and need to be refreshed.
2. Question - How do States who do their own research share that information? Suggestion was made to post on the EMTSP website.

The table below shows the prioritization from the 2014 meeting in Florida.

Rank	Challenges
#2	Fleet Performance Measurement (Michigan DOT)
#5	Equipment Cost and Financial Management
Selected for 2016	– Cost of Service Analysis
	– Charge-Back System
#3	Equipment Utilization Measurement
#1	Equipment Replacement Management
	– Replacement Cycle Guideline Development
	– Repair/Rebuild vs Replace Decision Making
Accepted by SCOR 2016	– Equipment Replacement Planning
	– Equipment Replacement Financing
#4	Equipment Disposal and Remarketing

Discussed whether the list needed to be renewed and how to gather new ideas. Topics need to be important and current issues states are dealing with. The group discussed top items from the list.

Following is a refreshed list from the Ohio meeting.

1. Updating warning light study, discussion ensued on what the scope should be. Expand on NCHRP 13-02 Each state laws are different, would be good to have consistency from state

to state. (green being used in Ohio) Maybe do a synthesis first to see what each state is doing and then develop scope.

2. Equipment repair/rebuild vs. replace decision making
3. Equipment disposal and remarketing
4. Identify existing and needed technologies on equipment, trucks, and vehicles
5. Guidelines for using sacrificial coatings
6. Equipment charge back system
7. Equipment replacement financing

**EMTSP Reactive Process to Research Needs:** Had a group discussion on how the EMTSP can have a more reactive process to research needs. Should a pooled fund be established similar to “Clear Roads” or just send research ideas to Clear Roads from this TWG, through the EMTSP?

### **July 18, 2016 – 3:30 to 5:00 – informal session**

**Maintenance Academy Resolution:** Passed out Maintenance Academy resolution for information to pass on to voting member

**Potential Domestic Scan Ideas:** May consider ideas not put forward as research topics. Tim asked if group is interested. Possible topic: outfitting, corrosion prevention, lighting. Settled on Corrosion, several states will work together to provide a draft application.

**New Research Problem Statement:** lighting was strongly suggested by Amir (TRB). TWG will submit 2 problem statements, Cost of Service analysis, and lighting.

Reviewed and revised current problem statement – Guidelines to Calculate Total Cost of Ownership for Fleet Operations, held a working session to edit document on screen.

### **July 19, 2016 – 10:00 to noon**

24 in attendance at this session

Lisa Kunzman, Caltrans and Bruce Erickson, Oregon were announced as a new Vice Chairs to the TWG.

**Problem Statements for Research Proposals:** The TWG continued to work on problem statements for research proposals.

1. “Guidelines for the Selection and Application of Vehicle and Equipment Warning Light Configurations, Colors, and Markings Operated on State Highway Right-of-Way”  
This potential project will utilize NCHRP 13-02 completed in 2008 but will look at; significant changes in technology, increased speeds and traffic volumes, and the increase of distracted drivers. Good discussion on problem statement that was developed by core group earlier in the morning.

## 2. Cost of Service Analysis

Had a Webinar/GoTo presentation by Michigan DOT on Fleet Performance Metrics – (presentation attached separately.)

**Possible Updates to NAFA Codes:** Had a discussion about NAFA codes needing to be readdressed to better match existing DOT equipment, suggestion to match to GVW if a perfect match isn't available. MDOT volunteered to champion group to further discuss.

**Training Modules Developed:** Discussed training modules developed:

“Preventive Maintenance Concepts” course being developed by NCPP for the EMTSP. It will be web based training, and someone will need to host the training in order for their employees to be able to take it. Maybe TC3, or a states training academy like Colorado DOT has? Education committee has worked hard on reviewing the modules.

“Benchmarking/Best Practices” was the other course discussed.

### **Open Discussion on Equipment Issues:**

Need for more money; salvage value; when to dispose. Caltrans caps repairs at \$6k and evaluates the current value, usage, and life before moving forward with repairs. Alabama has a \$5k limit. Question from NV, how do other states analyze equipment and document justification for major repairs?

### **July 19, 2016 – 1:00 to 2:30 - informal session**

Informal working session to edit research problem statements

### **July 20, 2016 – 8:00 to 10:00 - informal session**

**Research Problem Statements:** Discussed wrapping up the two research problem statements, and presentation for tomorrow.

Reviewed and finalized lighting problem statement. Lisa Kunzman volunteered Caltrans staff to do literature research.

Reviewed and finalized “Guidelines to Calculate Total Cost of Ownership for Fleet Operations” problem statement. (File attached separately)

Reviewed and finalized “Guidelines for the Selection and Application of Vehicle and Equipment Warning Light Configurations, Colors, and Markings”. (File attached separately)

**Domestic Scan Proposal:** Worked on the Domestic Scan proposal – “Equipment Asset Preservation and Protection Techniques”

Discussed what the problem statement should be and developed objectives for the report out on Thursday. We also refined information on the official form. More work still needs to be done before it is submitted.

### **July 20, 2016 – 10:15 to 12:00**

#### **EMTSP Oversight Panel Meeting:**

20 in attendance at this session

NE Report: from Columbus meeting Jim Chupas - Connecticut

- Content is hitting high points, avenue to be on the front end of new federal equipment requirements

Mid-west Report: from Columbus meeting from Doug Burke - Ohio

- Roundtable discussion is a great place to get information from all.
- Mechanics were a big discussion, retention, pay.
- Heavy on snow and ice discussions, blades (hybrid)
- Vegetation control

West Report: from Columbus meeting – Lisa Kunzman - Caltrans

- Held their Business meeting
- Roundtable was held as a Web-x meeting due to low attendance in person
- Change of officers, bylaws discussion
- Next meeting in Colorado
- Cash management, allocation of funds, financial plan
- Research needs
- Technical discussions, clear/back of cab, turning radius, truck speed, tow plows

SE Report: from Columbus meeting - John White South Carolina

- Research statements, gap analysis on equipment technology
- Next meeting in Georgia

#### **Takeaways from Tim:**

- EMTSP pays for one rep from each state to attend if you are a member, recruiting more attendance. They have been able to extend invitation to non-member states due to good management of funds.
- Rating system for assets, 4 digit system/utilization score (Lisa described)
- KS had a Brine tank explode – had useful life of 10 to 15 years, didn't expect it to blow up, expected a seam to come apart. Injured an employee, other state had similar experiences. Easy inspection methods discussed. Both non-destructive (water-soluble marker) and destructive (hit it with a bat). Now buying fiberglass tanks in KS.
- Green lights in Ohio, flash patterns, rates
- Discussed equipment for de-icing and anti-icing used by other states

Demonstrated EMTSP website, discussed changes needed.

Meeting adjourned at noon

## **AASHTO SCOM Maintenance and Operations Technical Working Group**

**Notes:** 1. Brad Darr, Chair of the TWG, and Vice Chairs Jim Feda and Dale Doughty, ran the sessions. Minutes written by Roemer Alfelor, FHWA Liaison  
2. For a list of session attendees, please see attached sign-in roster

### **Monday, July 18, 2016, 3-5pm**

**Welcome Remarks & Introductions:** Brad D. kicked off the session by introducing himself and the two vice chairs Jim F. and Dale D. He provided a quick description and history of the TWG, how it has evolved over the years from a Snow and Ice focus to a more comprehensive Maint. Operations focus. Then everyone in attendance was asked to introduce themselves. A sign-in sheet was passed around and a total of 45 people signed in, though a manual count of attendees during the meeting placed it at more than 50.

Brad also mentioned that the TWG is looking for volunteers to serve as liaisons to external groups and organizations that deal with Maintenance and Operations.

**Key 2016 Work Plan Activities:** Brad D. mentioned the following:

- Work with the TC3 to locate or develop new training material and continue with strong liaison role
- Promote “Training of Traffic Incident Responders” from SHRP 2.
- Investigate other Maintenance Operations T2 needs using interactive Computer-Based Training (CBT)
- Pursue and coordinate other significant efforts with Aurora and Clear Roads
- Initiate planning for the 5th Winter Maintenance Peer Exchange in 2017
- Seek out examples of winter maintenance practices and programs that demonstrate sustainability, and post appropriate results on the Center for Environmental Excellence website
- Promote the use FHWA’s INVEST tool
- Promote APWA’s “Sustainability in Public Works” conferences and Salt Institute’s “Safe and Sustainable Snowfighting”.

**Key 2015 Work Plan Accomplishments:** (in collaboration and/or coordination with other partner entities such as Clear Roads, Aurora, etc.) – Brad D. mentioned the following:

- Presented preliminary report on synthesis project relating to maintenance training and certification
- Completed planning for, and participated in, the 2015 Winter Maintenance Peer Exchange in Bloomington, MN
- Promoted the results of the revised Chapter 8 on Environmental Stewardship Practices, Procedures and Policies for Highway Construction and Maintenance (NCHRP 25-25) on Winter Operations and Salt, Sand and Chemical Management. This chapter is now current with field practices (revision cycle possibly every 2-3 years)

**Research Needs Statement:** Jim F. indicated that for 2016 the TWG came up with one NCHRP problem statement titled “Factors Influencing State DOT’s in Systematically Setting and Managing Winter Maintenance LOS” and that last year’s proposal titled “Making a Business Case for Winter Maintenance Actions including establishing the impacts of winter maintenance LOS on the Economy” was not selected. Someone commented that those 2 topics are highly related while another said that they may be combined. The group agreed that there is rationale for submitting both proposals, either individually or combined, for 2016.

**Clear Roads Pooled Fund Program Report:** Brad D. gave the report on behalf of Clear Roads. He described what the Clear Roads Pooled Fund Program’s primary goals and activities are, and its membership. There are currently 33 State DOT’s that make up the group. Some of the recently completed and existing projects are:

- Snow and Ice Control Environmental Best Management Practices
- Mapping Weather Severity Zones
- Cost-Benefit Analysis Toolkit
- Best Practices for the Prevention of Corrosion to DOT Equipment: A User’s Manual
- Identification and Recommendations for Correction of Equipment Factors Causing Fatigue in Snowplow Operators (current)
- Synthesis of Material Application Methodologies for Winter Operations (current)
- North American Study on Contracting Snow and Ice Response (current)

For 2016, the following projects have been approved for funding:

- Utilization of AVL/GPS Technology: Case Studies
- Standards and Guidance for Using Sensor Technology to Assess Winter Road Conditions
- Emergency Operations Methodology for Extreme Winter Storm Events
- Weather Event Reconstruction & Analysis Tool
- Training Video for the Implementation of Liquid-Only Plow Routes
- Aurora Winter Severity Index Update/Enhancement Partnership

Brad also mentioned two partnership initiatives that Clear Roads have, one with the industry to develop a protocol that would support a “plug and play” approach to integrating electronic devices and sensors on plow trucks, and the other with Aurora Pooled Fund, SICOP and AASHTO for the Winter Maintenance Peer Exchange.

The website for Clear Roads is: <http://clearroads.org/>

**Aurora Pooled Fund Program Report:** Tina Greenfield provided the report on behalf of Aurora. She mentioned that there are currently 17 member agencies of the group. Tina mentioned the two in-person meetings of the group:

1. Spring Board Meeting was held in Phoenix AZ last April 5-7, 2016, which discussed member agency activities, current Aurora funded project updates and new project selections (i.e., 2 projects accepted as complete, 4 projects cancelled, 3 new projects accepted, and 3 proposals left unfunded). Tours of AZDOT’s Traffic Operations Center and Flood Mitigation Stations were also made.
2. The Fall Meeting will be held in Buffalo, NY October 4-6, 2016

Tina also gave an update on status and outcomes of the following Aurora projects:

- RWIS Network Planning: Optimal Density and Location (Aurora 2010-04 and 2016-03) – Phase 2 has been funded
- Storm Simulator Training Tool (Aurora 2011-02) - Testing
- Validate Accuracy of Pavement Predictions (Aurora 2012-01, 2014-03) – Eliminated
- Transition of Clarus to MADIS - Eliminated
- Improving Estimations of Real-Time Traffic Speeds during Weather for Winter Performance Measurement (Aurora 2013-03/2015-03) – Completed
- Aurora Accuweather Index (Aurora 2013-06 and 2016-02) – Funded (w/Clear Roads)
- Seasonal Weight Restrictions, Phase II (Aurora 2014-01) – Model Runs Scheduled
- Quantifying Salt Concentration on Pavement Phase 2 (Aurora 2014-02) – Underway
- Snow Liquid Water Equivalent for PWD Sensors (Aurora 2015-01) – Ending
- Review Synthesis for Alternative Power Supplies (Aurora 2015-04) – Funded
- Non-Traditional RWIS (Aurora 2015-06) – Eliminated
- Utah Snow and Ice Performance Measure Tool for Aurora (Aurora 2016-01) - Funded

The Aurora PF Program website is: <http://www.aurora-program.org>

**TRB Winter Maintenance and Surface Transportation Weather Committees:** Tina Greenfield also provided the report for these committees. She recently took over the Chair of the TRB Winter Maintenance Committee, replacing Max Perchanok.

Tina talked about the TRB International Winter Maintenance and Surface Transportation Conference that was held last April 25 – 27, 2016 in Fort Collins, CO. The conference was followed by the SIRWEC meeting on April 27-29 in the same venue. She said that the meeting format was different from previous conferences. In order to facilitate more interaction and information-gathering, the research papers/presentations were pre-recorded for online and on-demand viewing, while the majority of the in-person meeting time was devoted to discussion and breakout sessions. The following key topics were discussed during breakout sessions at the conference proper:

- Tools to aid travel planning
- Best management practices
- Equipment and materials
- Big Data for winter maintenance
- Decision support for maintenance operations
- Resilience and climate change

For each topic, the breakout group discussed and identified gaps in research and barriers to implementations, as well as ways that these deficiencies may be addressed. Tina said that there were a number of topics that had considerable discussions, and in some cases were discussed in various ways in multiple sessions.

**Training and Certification of Highway Workers:** Katie Zimmerman of Applied Pavement Technology gave a presentation that summarizes the results of the NCHRP Synthesis Study

on Maintenance Training and Certification. The presentation covers the types of topics addressed by training and certification programs, the delivery methods used to provide the training, the sources of instruction, and whether material-sharing relationships are being utilized to access training. In addition, the study captured how training is related to performance and the incentives being used by state and provincial agencies to encourage front-line maintenance workers to complete training.

Meeting adjourned at exactly 5:00 PM

### **Tuesday, July 19, 2016, 10am-12 Noon**

Presiding: Brad Darr, Jim Feda and Dale Doughty / FHWA Liaison: Roemer Alfelor  
Meeting was well attended, the sign-in sheet was passed around but could not be found afterwards.

**Research Needs Follow Up:** Jim F. asked the group if they have given any thoughts to the NCHRP research problem statements that were brought up on Monday. Jim mentioned those 2 statements again, one a new statement and the other submitted last year. Hearing none, Jim F. said the TWG will likely submit those 2 research proposals.

**2015 Winter Maintenance Peer Exchange Report:** Rick Nelson of AASHTO provided a summary of the peer exchange that was held in Bloomington, MN last September 2015 and co-sponsored by SICOP, Clear Roads and Aurora. There were approximately 150 attendees including 19 vendors. The peer exchange was focused on Maintenance Operations, and consisted of one day presentations/discussions on the coordination between network operations and maintenance operations, one day presentations/discussions on State Best Practices, and half day of breakout sessions. The breakout sessions were as follows:

- Materials, Sustainability, Environment
- Equipment, Operations, Tactics
- Strategies, Work Force, Public Relations
- Weather, Information, Traffic Operations

The results of the Peer Exchange have been shared with Clear Roads, Aurora, AASHTO SCOM, TRB and SICOP to help them develop relevant Project Problem Statements

**Maintenance Relevant STMS&O Activities and Liaison Report:** Galen McGill of Oregon DOT is the AASHTO SCOM liaison to the AASHTO Subcommittee on Transportation System Management & Operations (STSM&O) of which he is a lead for the Technical Working Group on TSM&O Research. Galen started off with the composition of STSMO Leadership Team and the strategic goals of the Subcommittee which are:

- Promote proven TSM&O concepts and strategies
- Support TSM&O performance measurement and management
- Support Workforce Development
- Continue to make the business case for TSM&O
- Coordinate among AASHTO groups and other organizations involved in TSM&O.
- Support National Operations Center of Excellence

- Implement SHRP 2 capability maturity model to improve agency TSM&O capability
- Development and deployment of Connected and Automated Vehicles.

Some of the recent accomplishments of STSM&O identified by Galen are:

- Implementation of the National Operations Center of Excellence in Collaboration with FHWA, ITE and ITS America
- TSM&O Workforce Development Summit
- Developed NCHRP 20-7 – TSM&O guidebook and standards
- Developed a webinar to share best practices for TIM towing and emergency relocation practices
- Participated in the review and response to FHWA NPRM for System Performance
- Co-sponsored Pre-TRB and Post-TRB webinars on current TSM&O research
- Connected/Automated Vehicle Outreach, Education & Development:
- Survey on V2I Applications, Pilot Site Presentations, Patent Infringement Issues

He then discussed some of the 2016 activities and plans of STSM&O, which include Collaboration with TRB RTSMO and Freeway Ops Committees, NCHRP 07-20 Guidance on the Implementation of TIM Performance Measures and NCHRP 03-114 Planning and Evaluating Active Traffic Management Strategies, Collaboration with NOCoE, NCHRP 20-7 Projects pertaining to TSM&O Standards for Highway Infrastructure and Synthesis Projects on Asset Management for TSM&O, State DOT Organizational Structures and Funding Mechanisms for TSM&O, and Planning for Resiliency for Operations: Lessons Learned from Current Practices.

**Connected Vehicle Interaction with Maintenance Workzones:** Dean Deeter of Athey Creek Consultants gave a presentation that focuses on: (1) the Results of a Survey on Connected Vehicle Priorities, (2) Connected Vehicle Applications Related to Maintenance Operations and (3) Upcoming Activities of the Vehicle to Infrastructure (V2I) DC of Interest to Maintenance and Operations. Dean said that the following Connected Vehicles Applications are relevant to Maintenance Operations:

- Vehicle Data for Traffic Operations
- Enhanced Maintenance Decision Support System
- Road Weather Information for Maintenance and Fleet Management Systems
- Road Weather Motorist Alert and Warning
- Variable Speed Limits for Weather-Responsive Traffic Management
- Warnings about Hazards in a Work Zone
- Warnings about Upcoming Work Zone

A survey was conducted to determine which of these CV applications, in addition to other non-maintenance operations applications, are considered most beneficial to deploy and are being planned by transportation agencies. The survey showed that Nos. 1, 4 and 7 were included in both categories.

Dean also showed graphically and discussed how maintenance operations will be performed in a Connected Vehicle environment including data flows and architecture. Finally, two activities of the V2I Coalition that would be of interest to the TWG are the OEM Workshop Where vehicle and infrastructure data needs/availability will be presented and discussed, and a webinar in September on Maintenance Costs of Roadside Equipment.

**Snow and Ice Cooperative Program (SICOP):** Rick Nelson provided a quick update on the SICOP activities, including their recent activities such as new factsheet and improved website and the 3-yr Strategic Winter Maintenance Program that focuses on identifying gaps and issues in winter maintenance, member state-driven approach, program accountability and transparency. Rick also mentioned 3 of their flagship projects – the RWIS/Anti-icing Computer Based Training suite, the Snow–Ice List Serve and Winter Maintenance Peer Exchange of which they are a co-sponsor. Finally, Rick talked about the current Connected Vehicle Pilot Deployment Project in Wyoming that focuses on Road Weather particularly during winter.

The meeting ended just before 12 Noon.

### **Wednesday, July 20, 2016, 8am-10am**

Presiding: Brad Darr, Jim Feda and Dale Doughty / FHWA Liaison: Roemer Alfelor  
Thirty seven (37) people wrote their names on the sign-in sheet. The meeting includes several presentations. Brad Darr introduced each presenter.

**FHWA Maintenance Operations Update:** TIM Training, Road Weather Connected Vehicles and Smarter Workzones - Roemer Alfelor of FHWA Road Weather Management Program provided an update on the activities of the FHWA Office of Operations that are relevant to the TWG. First he talked about the Traffic Incident Management (TIM) Training Programs that are available to transportation agencies at different levels of the organization, and then focused on the National TIM Responder Training Course that was developed under SHRP2 and delivered in 3 formats – in person training, web-based training and train the trainer. Roemer reported that more than 191,000 responders have been trained under this program, but that is only less than 20% of the target.

Roemer then talked about Road Weather Connected Vehicle Applications that the FHWA is working on, specifically the Weather Data Environment website, the Pikalert Vehicle Data Processing and Quality Checking Tool, the Integrated Mobile Observations Project and the recently completed Weather Responsive Traffic Management implementation projects that FHWA funded. The FHWA is also currently working on an Every Day Counts (EDC) Initiative that will deploy the Integrated Mobile Observations applications as well as the Pathfinder guidance recently developed to help agencies coordinate with their local weather forecast offices. Finally, Roemer provided an update on the Smarter Workzone Initiative which is also an EDC activity but is nearing completion. The SW Initiative features innovative workzone project coordination and planning strategies as well as application of ITS technologies to improve workzone safety and mobility.

**Salt Best Management Practices:** Mark Devries (works for Vaisala) gave the presentation on behalf of Wilf Nixon on the research study they did to determine best management practices for all stages of the “road salt lifecycle” pertinent to highway agencies, create a handbook that presents those BMPs in an accessible and effective manner, and provide a report detailing the processes by which the BMPs were identified and the handbook created.

The study showed that agencies can save up to the following percentages of salt (compared to a standard deicing strategy) by using the following practices:

- Pre-wetting – 30%
- Anti-icing – 75%
- Varying application rates to account for pavement temperature, storm type, and cycle time – 50%
- Calibrating your equipment – unknown but can be big
- In addition, some of the BMP’s that agencies can adopt or implement are:
- Measure what you put down and where you put it
- Hold your organization accountable for the salt it uses
- Use liquids where appropriate – and have a process to determine whether or not their use is appropriate
- Quit using salt when it gets too cold – and define what is too cold for your operations
- Get the best possible forecast you can
- Base your operations off your levels of service, and measure whether you have achieved them relentlessly
- Appropriate and effective training

**Outcomes from the 2016 TRB Winter Maintenance Conference and SIRWEC Conference:**

Tina Greenfield already discussed the 2016 TRB Winter Maintenance and Surface Transportation Weather Conference during her TRB update on Monday so she just quickly identified some of the highlights from the meeting and mentioned that a short summary/proceedings will be posted by TRB on its website in September.

Rick Nelson gave a brief summary of the SIRWEC conference that was held right after the TRB meetings in Fort Collins. Rick said there were 24 presentations and 11 posters that were received well by the participants. The presentations were grouped into the following sessions: Road weather management systems, Novel technologies in road weather, Decision support systems and road weather, Integrating road weather information and operations and Moving RWIS forward. The presentations can be viewed at the SIRWEC website <http://www.sirwec.org>. The next SIRWEC event is being planned in conjunction with the PIARC International Winter Road Congress to be held in Gdansk, Poland in 2018

**Alaska Dalton Highway Flood Response/Heads Up Display Update:** Mike Coffey of Alaska DOT gave a detailed presentation, complete with photos and videos, of how their agency responded to the disastrous arctic flood on Dalton Highway in Alaska that took place in the Fall on 2014. The flood was the result of the ice melting around and ponding on the highway.

According to Mike the impacts of the ice and flooding were dramatic:

- 24 miles of Dalton Highway were impacted;

- 28 days the highway was closed;
- Two state disaster declarations were issued; and
- \$17 million were spent for emergency repairs

Through a series of pictures and videos, Mike showed the extent of the disaster, the constraints they faced, the types of actions they took, and lessons they learned from this disaster.

**Nevada DOT Response to MS4 Permit Requirements and Storm Water Regulations:**

David Gaskin, Deputy Director at Nevada DOT, gave a presentation on the Stormwater Program that the agency is implementing to comply with the EPA requirements pertaining to unauthorized stormwater discharges on the State highways, right of way, and conveyance systems. In 2011, NDOT was audited by the EPA and the agency's Stormwater Program was found to be inadequate.

As part of the program implementation, NDOT created a Stormwater team consisting of several current managers and staff in the agency. Additional members will be added to the team. They have also purchased a number of equipment to clear/treat stormwater including culvert cleaners, remote control loaders and trailers, sweepers and pickup trucks, and improved/upgraded their maintenance yards. David showed a video of one of their washpads for snowplows and maintenance vehicles. NDOT also identified and uploaded on a GIS program majority of their pipes, drop inlets, manholes, channels, basins and other stormwater structures so that information on these assets can be shared to support maintenance scheduling and planning. Lastly, they have created a website for the program to inform and engage the public about their activities and progress. Users can submit comments through the website and also report illegal discharges on the roadways. David ended his presentation by saying that NDOT is developing a dedicated Stormwater Division that focuses on meeting and exceeding the stormwater provisions of the Clean Water Act.

**Round Table Discussion:** Jim Feda reported on the new (NCHRP 20-7) research statements that are being submitted by the Maintenance and Operations TWG which include:

- Factors Influencing State DOT's in Systematically Setting and Managing Winter Maintenance Levels of Service
- Making a Business Case for Winter Maintenance Actions including establishing the impacts of winter maintenance LOS on the economy- second attempt
- Very Short Duration Work Zone Safety for Maintenance Activities

Jim asked the attendees if they have any comments on these research topics, but nobody said anything.

Brad indicated that the TWG is still looking for volunteers to serve as liaison(s) to the other committees, coalitions and groups that deal with maintenance operations, and to contact him if anyone is interested.

Session adjourned at exactly 10am.

## **AASHTO SCOM Roadway Roadside Technical Working Group**

### **Monday, 18 July 2016**

Opening remarks – Jerry Hatcher (39 in attendance)

Start thinking about

- Topics for our open discussion on Tuesday
- Research Ideas

SCOM is looking for Volunteers to act as Liaisons between SCOM and other groups.

#### **Presentations:**

NCHRP 20-7 Task 357: Best Practices for Collecting, Processing and Managing Roadway Asset Inventory Data

- Tucked into the report is a guide
- A copy of the guide is on AASHTO SCOM website

No Boundaries Pooled Fund

- No Boundaries is to share Equipment, Materials and Procedures

### **Tuesday, 19 July 2016**

Opening Remarks – Jerry Hatcher (41 in attendance)

Handout list of other committees/groups and asked to look over and see if anyone is currently participating or has an interest in participating please see someone in SCOM leadership to volunteer.

#### **Presentations:**

NCHRP Synthesis 470 Maintenance Quality Assurance Field Inspection Practices

Alternative Methods of Temporary Traffic Control Devices on Rural Roads

#### **Open Discussion:**

Current Maintenance Issues/Concerns/Best Practices

#### **Does anyone use Temporary Traffic Signals?**

MO

- Most Recent Loss was a Flagger
- Has very few AFAD
- Wants to know how common their use is

WA

- Has and uses
- Notice that once a crew has they don't want to give it up

LA

- Has bought and sent them out to their Parishes
- Used state Safety money to purchase

IA

- Only uses Temporary Traffic Signals
- Has Specs in their construction Manual

TN

- Uses

WV

- Has temporary signals all over the state

### **Does anyone Incorporate Temporary rumble strips?**

VA

- Notice that people tend to go around particularly in urban areas

OH

- Is testing their use

OK

- Uses on Interstate to Slow down traffic
- Is using and starting to purchase more incorporates a 10 MPH speed reduction prior to the rumble strips

### **Do you allow utilities and contractors use AFIBS as an alternative to flagging?**

#### **MASH Implementation:**

SC

- Put together committee to discuss how to implement
- ID pre 350 devices and start to replace

GA

- If end treatment is hit the End treatment + 25' is replaced

MS

- All Guardrail is done in place and repaired in kind

LA

- Upgrades if Hit

Who has power coated guardrail?

What do you do for litter?

Anyone had trouble with contract mowing?

### **Wednesday, 20 July 2016**

Opening Remarks (37 in attendance)

**NCHRP Synthesis 491:** Uses of mobile information technology devices in the field for design, congestion and asset management

Questions:

There is a need for standards purpose and need?

Is there a need for an “E-Maintenance” initiative?

**Establishing and Preserving Pollinator Habitat along Highways:**

There is a guide that will be posted on the FHWA website

[https://www.environment.fhwa.dot.gov/ecosystems/vegmgmt\\_pollinators.asp](https://www.environment.fhwa.dot.gov/ecosystems/vegmgmt_pollinators.asp)

[https://www.environment.fhwa.dot.gov/ecosystems/Pollinators\\_Roadsides/BMPs\\_pollinators\\_roadides.asp](https://www.environment.fhwa.dot.gov/ecosystems/Pollinators_Roadsides/BMPs_pollinators_roadides.asp)

[www.xerces.org](http://www.xerces.org)

It was noted that the Maintenance community has not heard much of this information before or anything about the report coming out.

It was noted that this was the group who needed to see the presentation and the presentation would be good for the general session.

There was talk of how to include the maintenance community in the national discussion.

# **AASHTO SCOM Pavement Technical Working Group**

## **Monday, July 18th Scheduled Meeting Time – 3:00 pm to 5:00 pm**

Chair: Anita Bush, Nevada, Vice Chair: Scott Capps, North Carolina, Vice Chair: Bart Sweeney, Connecticut, FHWA Liaison: Marc Hoelscher

Anita covered today's agenda and facilitated the welcome and opening remarks

- Overview of Pavement TWG
- Vision, Mission and Strategic Goals
- Focus Areas
- 2016 Work Plan Goals and Accomplishments
- Past Research Overview
- PTWG Annual Business Meeting
- 2017 Work Plan
- 2017 Research Problem Statements
- AASHTO Liaisons to other Committees
- Rod Birdsall, FP2

### **Technical Presentations:**

-Indefinite Delivery/Indefinite Quantity Contracting for Preservation Projects, Jeff Lewis, Construction and Contract Administration Engineer, FHWA

- Indefinite Delivery/Indefinite Quantity Contracting for Bridge and Pavement Preservation  
Jeremy Hunter, Bridge Design Manager, Indiana Department of Transportation

Anita welcomed the group, Self-introductions, Covered the overview of the PTWG, its vision, mission, strategic goals and focus areas.

### **2016 Accomplishments:**

- Webinar thru TRB on “Current Practices in Conducting Field Inspections for Maintenance Quality Assurance (MQA), NCHRP Synthesis 470: Maintenance Quality Assurance Field Inspection Practices”
- PTWG hosted a webinar on “Safety Benefits of Friction – Current Pavement Treatments for Preservation and Safety”
- PTWG hosted a webinar on “INVEST 1.2 – Self-Evaluation Tool Supporting Roadway Sustainability”
- Promoted the development of Contractor and Agency Pavement Preservation Treatments Certificate Programs.
- Promoted a webinar on Keyhole Coring and Reinstatement thru the Transportation Learning Network
- New Approaches to Utility Cut Pavement Repair Tech Brief, Review and Comment
- Use of Thin-Lift Asphalt Surfaces for Pavement Preservation, Tech Brief Review and Comment
- Microsurfacing, Slurry Seals and Chip Seal Quality Assurance Best Practices Tech Brief

**Ongoing and New Research:** Jon Wilcoxon, covered ongoing and new research.

- 2014 NCHRP 14-33 - Pavement Performance Measures that Consider the Contributions of Preservation Treatments. Research in progress, Completion date of 11/30/2016
- 2015 NDOT/FHWA – Microsurfacing, Slurry Seals and Chip Seal Quality Assurance Best Practices Tech Brief, Review of Tech Brief is complete, awaiting publication
- 2015 20-07/380 - Review and Update of the AASHTO Maintenance Manual for Roadways and Bridges. A proposal has been selected for award.
- 2016 NCHRP 14-38 (Pending) – Guide of Timing of Asphalt-Surfaced Pavements Preservation. Proposals have been received in response to the RFP; agency selection and contract processing are underway.
- Discussion on other completed NCHRP research.

**New Proposed Research Statements:** New proposed research statements were handed out.

- Highway Network Alternatives to Determining High Stress Pavement Safety Hotspots or Developing Pavement Friction Testing Processes for Network Level Analysis or Improving Pavement Friction Testing through Use of Macrotexture
- Guide Construction Specifications for Cold In-place Recycling (CIR) and Cold Central Plant Recycling (CCPR)
- Utilization of Customer Input to Develop Maintenance Quality Assurance (MQA) Characteristics and Measures for Flexible Pavements
- Developing a Framework for Cost-Effectiveness Measures for Pavement Preservation
- Temporary Work-zone Safety for Pavement Maintenance Activities
- Synthesis on Pavement Grinding and Milling Maintenance
- Development of Pavement Patching Guidelines
- Use of Ground Penetrating Radar to Determine Pavement Condition and Rehabilitation Strategies
- Development of Improved Patching Materials and Procedures for Partial Depth Repairs and Dowel Bar Retrofit Installation
- Development of Longer Life and More Effective Joint Sealing Products
- Development of Pavement Management Triggers Values for Identifying the Proper Timing and Treatment of Concrete Pavements
- Diamond Grinding and Grooving of Asphalt Concrete for Texture and Safety Improvement
- The Use of Penetrating Sealers for Concrete Joint Preservation

Anita asked for the group to think about research topic ideas for the next meeting.

**Foundation for Pavement Preservation Update:** Rod Birdsall, FP2 – Presentation on the FP2 organization, mission, supporters, updates.

What we do?

- FP2 Inc. financially supports The National Center for Pavement Preservation at Michigan State University
- FP2 Inc. works closely with Regional Preservation Centers in California and Texas Regional Preservation Partnerships, Federal Highway Administration
- Publish Pavement Preservation Journal

- Participate in ETF and ETG
- Mission Advocacy: educate public officials at all levels & involved with legislation.
- Research: Funding partner in NCAT 2012 PG study and 2015 NCAT/MN Road PG project
- Communication: sponsor key events, publish the Pavement Preservation Journal, distribute educational materials

#### What's Next?

- FP2 remains engaged in this process to ensure that preservation outcomes remain as intended
- Next round of legislation-when? 5 years will go by fast
- Discussions and actions by the Senate Finance and Appropriations Committees under way regarding long term funding for transportation
- Highway Trust Fund????
- User Fee Options on the table- Fuel, VMT, Registration, General Fund

**AASHTO Liaison to Other Committees:** Anita covered AASHTO Liaisons to other committees.

#### **Technical Presentations:**

- Indefinite Delivery/Indefinite Quantity Contracting for Preservation Projects, Jeff Lewis, Construction and Contract Administration Engineer, FHWA
- Historic Background on procurement requirements and the SEP-14 process, along with a timeline of SEP-14 milestones and other alternative contracting methods.
- Covered the definition of ID/IQ, selection based on the lowest bid or bid factor for a given estimated scope, appropriate for preventive maintenance and reoccurring tasks and NCHRP Synthesis 473.
- Overview of NYDOT sample job order contracts.
- ID/IQ Award Methods
- Bids based on estimated quantities – contractors bid unit prices, task orders issued based on bid prices; (MN)
- Same as above, but multiple awards made, tasks orders issued based on lowest bid for quantities in task order (DE)
- Construction Task Catalogue – contractors bid markup rates for defined tasks; job orders issued based on markup rates (NY, NJ, MO)

#### **ID/IQ Contract Administration Reminders:**

- 23 CFR 635
- NEPA
- Buy America
- FHWA Form 1273
- Davis-Bacon
- Etc.

FHWA Special Experimental Project Application (SEP-14) – Requires:

- FHWA HQ's approval / Legal Sufficiency Review
- Work Plan
- Evaluation Plan (typically 2-3 years to determine if to make mainstream)

### **Indefinite Delivery/Indefinite Quantity Contracting for Bridge and Pavement**

**Preservation:** Jeremy Hunter, Bridge Design Manager, Indiana Department of Transportation  
 What is ID/IQ?

Contract under which INDOT may assign contractors an ongoing series of individual job orders

- Pre-priced task catalog
- Competitively bid overhead and profit factors
- Comprehensive task items

Joint-Scope Meetings

- Tailors the project to the need
- Reduces contractor risk
- Ensures a collaborative partnership

On-Call Contract Functionality o Enables quick response to preservation needs

Flexibility to meet unknown needs

- Unit Price Pay Items
- Time and Material Pay Items

### **INDOT ID/IQ Details:**

INDOT Greenfield District Pilot Program - Two Contracts:

Bridge Preservation

- Beam Support and Repair
- Substructure Repairs
- Expansion Joint Repairs / Replacement

Pavement Preservation

- Asphalt and Concrete Pavement Patching
- Micro-Surfacing

Current Projects

- Bridge Critical Find Response
- Substructure Repairs to stabilize bearing seats
- Pavement Patching with Micro-Surfacing

Objectives

- Maintain serviceability of asset with targeted scope

### **Challenges to Navigate / Lessons Learned:**

Integration with current process

- Software Integration
- Personnel Integration

Task Catalog Development

- Scope of included task items
- Diversified vs. Narrow Scope Contract

Determining Ideal Contract Size / Funding Amount

**INDOT ID/IQ Program Schedules:**

INDOT Greenfield District Pilot Program

- First letting (complete): Feb. 17, 2016
- Pilot Program complete: February 2017
- If successful: Expand statewide in early-2017

Adjourn 3:00 pm

**Tuesday, July 19th Scheduled Meeting Time – 1:00 pm to 2:30 pm**

Chair: Anita Bush, Nevada, Vice Chair: Scott Capps, North Carolina, Vice Chair: Bart Sweeney, Connecticut, FHWA Liaison: Marc Hoelscher

Agenda

**Technical Presentation:**

- New Approaches to Utility Cut Pavement Repair: Keyhole Coring & Reinstatement, “An FHWA Best Practice” – Marshall Pollock, Utilicor Technologies Inc. and Dennis Jarnecke, Gas Technology Institute

**PTWG Annual Business Meeting:**

- 2017 Research Problem Statements

Results of research problem statement ranking from PTWG Attendees and discussion on what to carry forward

1. Temporary Work-zone Safety for Maintenance Activities
  - To be forwarded to Maintenance Operations TWG
2. Developing a Framework for Cost-Effectiveness Measures for Pavement Preservation.
  - NCHRP 24 months \$300K
3. Development of Pavement Management Triggers Values for Identifying the Proper
  - Timing and Treatment of Concrete Pavements
  - Katie - Preservation strategies for PCC
  - 20-7 Guidelines for the Timing of Concrete Preservation Treatments, 12 months, \$100K
4. Guide Construction Specifications for Cold In-place Recycling (CIR) and Cold Central Plant Recycling (CCPR)
  - NCHRP, 18 months, \$175K
  - Visit with AASHTO Construction and Materials subcommittee to get input and for endorsement of this research.
5. Utilization of Customer Input to Develop Maintenance Quality Assurance (MQA) Characteristics and Measures for Flexible Pavements

- Forward research problem statement “Temporary Work-zone Safety for Maintenance Activities” to Maintenance Operations TWG.

Carry Forward:

1. Developing a Framework for Cost-Effectiveness Measures for Pavement Preservation
2. Guidelines for the Timing of Concrete Preservation Treatments
3. Guide Construction Specifications for Cold In-place Recycling (CIR) and Cold Central Plant Recycling (CCPR)

Adjourn 2:40 pm

**Wednesday, July 19<sup>th</sup> Scheduled Meeting Time – 10:15 am to 12:00 pm**

Chair: Anita Bush, Nevada, Vice Chair: Scott Capps, North Carolina, Vice Chair: Bart Sweeney, Connecticut, FHWA Liaison: Marc Hoelscher

**Agenda – Technical Presentations**

- Communicating Maintenance Needs Through a Transportation Asset Management Plan (TAMP) – Katie Zimmerman, Applied Pavement Technology, Inc.
- Partial Depth Repairs – Gordy Bruhn, Concrete Pavement Rehabilitation Specialist, Minnesota Department of Transportation
- Impact of Joint sealing Effectiveness on Pavement Performance – Larry Scofield, International Grooving and Grinding Association
- Pavement Certification Program in Nevada – William Hoffman, Nevada Department of Transportation
- Pavement Preservation (When, Where, and How) via the EDC-4 mechanisms - Bryan Cawley, FHWA
- Pavement Preservation Expert Task Group Update - Anita Bush

**Communicating Maintenance Needs Through a Transportation Asset Management Plan (TAMP) – Katie Zimmerman, Applied Pavement Technology, Inc.**

Katie hopes that you get involved in the development of your asset management plan

- Introduction to a Transportation Asset Management Plan (TAMP)
- Strategies for Communicating Maintenance Needs
- Information Needed

**Introduction to a Transportation Asset Management Plan (TAMP)**

Covered MAP 21 TAMP Requirements

- a summary listing of the pavement and bridge assets on the National Highway System in the State, including a description of the condition of those assets;
- asset management objectives and measures;
- performance gap identification;
- lifecycle cost and risk management analysis;
- a financial plan; and

- investment strategies

Ten year plan with what level of asset investment will be made with your projects?

TAMP helps to align decisions at all levels within an agency and help to layout the investment within a ten year period.

TAMP – State example was showing they spend 93% taking care of their system.

#### Strategies for Communicating Maintenance Needs:

- Whole Life (or Life Cycle) Costing
- Risk Assessment
- Investment Strategies
- Financial Metrics

#### Whole Life Costing Examples

- Intended to show that agencies are managing assets cost-effectively
- Provides an opportunity to show the importance of maintenance to preserve asset conditions
- Also provides a way to show future maintenance needs associated with system expansion

#### Risk Assessment Examples - Risks should be linked to investment strategies

- Flattened revenues
- Workforce was changing – 35% of a workforce was going to retire by 2021
- Extreme weather events
- Price volatility

#### Investment Strategies

- 10 year investment strategy
- Performance targets need to be determined (example: pavements, bridges, culverts, other)
- Target of reducing overall life cycle costs of maintaining pavements, bridges and culverts requires: Increased preservation and unified approach to maintenance and capital planning.

#### Financial Metrics

- Annualized costs
- Asset Sustainability Ratio (ratio of investment level to annual depreciation)

#### Information Needed

- Actual or estimated inventory
- Assessment of performance (Condition & Age)
- Estimate of amount of work being done on the assets.
- Cost Information

**Partial Depth Repairs** - Gordy Bruhn, Concrete Pavement Rehabilitation Specialist,  
Minnesota Department of Transportation

Partial depth repairs work best when they remain as partial depth repair state. You need to have base and bottom in good condition. Do your homework with coring during project development.

Types of Partial depth repair by payment method:

- Partial Depth Repair Type BA (ft<sup>2</sup>)
- Partial Depth Repair Type B3 (lineal foot)
- Partial Depth Repair Special Type BE (ft<sup>2</sup>)

Minimum depth of 2" with a tapered edge and use of less than 35 hammers. Sandblast all your repairs, no exceptions and re sand blast after a rain event. When changed to full depth repair, pay 40% of PDR and 100% of FDR. Using duct tape for bond breaker on dowel bars.

Partial Depth Mix-3U18

- Small Aggregate 100% passing 3/8" sieve
- 850 lbs Type I Cement
- 6.5% - liquid air
- Maximum 1 inch slump
- Can't get out of Ready Mix
- Cure time of 12 hours
- Vibrate 3U18 Concrete for PDR's

Finishing tips

- Pull towards the edges
- Grout on Edges
- Curing compound within ten minutes
- Saw and seal and hot pour joints

Repair Warranty

- Repair any areas of failure within thirty (30) calendar days at no cost to the department.
- The 30 calendar day warranty will commence after all Type B, Type C, Dowel Bar Retrofits repair and Concrete Grinding (if required) are completed in a single traffic lane.

**Impact of Joint sealing Effectiveness on Pavement Performance** - Larry Scofield,  
International Grooving and Grinding Association

When to Reseal & Sealant – When the sealed joint is no longer functioning

- You can have performing and non-performing sealing based on construction practices
- Design sealing installations – web apps on ACPA App Website for designing joints.
- Clean, Dry and Bondable

- Guidelines for joint details were presented. Demonstrated joint movement demonstrator and joint noise estimator.
- Percent of Total Cost for each operation of sealing a joint. Cleaning is the smallest cost but is the most important and the least inspected. Media blasting needs to be done at the end. Keep the joints clean during construction. Do not use open cell backer rod and do not stretch. Larry does believe in beveled joints and over banding.
- Recommend going a little deeper than a 1/8" recess.
- Ensure narrow joints are sealed from the bottom up.

#### Summary

- Design Joint Sealant System for the Expected Joint Movements
- Select a Joint Sealant Material and Backer Rod Appropriate for the Intended Purpose
- Ensure Proper Cleaning and Preparation– Clean, Dry and Bondable
- Inspect the Work and Verify its Acceptability
- Seal/No Seal Group

#### **Pavement Certification Program in Nevada** - William Hoffman, Nevada Department of Transportation

##### Why Certification at NDOT?

- Improve Quality
- Education Opportunities – On Both Sides
- Turnover Rates of Owner & Contractor Staff
- Morale Builder – Spotlight Maintenance Staff
- Build Stronger Relationships with Contractors

##### Nevada Preservation Task Force

- Communicate Certification Expectations
- Performance Base Specifications
- Means and Methods
- Warranties
- Quality Expectations by NDOT

##### Certification Program

- NCPP White Paper - Certification Program for Pavement Preservation Treatments – Pilot Program
- Chip Seals, Slurry Systems & Crack Treatments
- Owner Certification is Voluntary
- Company Certification
- Contractor Key Personnel Certification
- Contractor Key Staff Verification
- Quality Control Plans

##### NDOT Pilot Program FY 16

- Chip Seals & Slurry Systems

- Contractor Key Personnel Certification
- Contractor Key Staff Verification
- 2 Chip Seal and 2 Micro-surfacing Projects
- Full Certification for FY '17 Projects
- Tracking Quality Throughout

Shared pilot project exam results both contractors and NDOT staff. (Lessons Learned)

- Planning/Time Requirements
- Close Coordination w./NCCP Necessary
- Constant Communication w/Contractors
- Certification Specifications
- In-House Training Opportunities (Re-Test)

**Pavement Preservation (When, Where, and How) via the EDC-4 mechanisms** – Bryan Cawley, FHWA

What is the best way to take various knowledge to the DOT's?

- George – The three below work the best
  - Web training
  - Technology Briefs
  - Webinars
- Funding allocation/grants
- R26 workshop – State DOT do not have the staff to monitor test sections, need technical assistance
- Using the Pavement Preservation Partnership to blend the partnership work
- Workshops out to the field staff, hands on in the field
- STIC programs, million dollar grants continue this process to help implementation

**Pavement Preservation Expert Task Group Update** – Anita Bush, NDOT

Initial Meeting September 2015

Recognized PPETG members

Intent - The FHWA intends to provide a forum through the formation of a Pavement Preservation Expert Task Group (PPETG) whereby knowledgeable practitioners can provide timely input to and coordination among stakeholders in the pavement community on strategies, practices, research, deployment, and professional development needs pertaining to preservation in the overall management of the national inventory of publicly owned highway pavements.

Mission - The PPETG will advance and improve the state of the practice in the area of highway pavement preservation by working collaboratively with federal, state and local agencies, industry, and academic interests

Vision - "Preserving the nation's valuable highway infrastructure with the right treatment for the right road at the right time."

2nd Meeting – March 2016, Austin, TX - Formed 5 working groups

- Update Research and Implementation Roadmap for Pavement Preservation
- "Top 10" List: Characteristics of a "World Class" Pavement Preservation Program
- Performance Measures for Specifications
- Distress Warrants
- Calculating the Benefits of a Pavement Preservation Program

Next PPETG Meeting - September 12-14, 2016 at MnDOT's Cedar Avenue Truck Station

Adjourn 12:00 pm