AASHTO Subcommittee on Construction
Research Steering Committee
2012 Meeting Minutes
San Francisco, California

The 2012 meeting of the AASHTO Subcommittee on Construction (SOC) Research Steering Committee (RSC) was convened at 6:30am on August 14, 2012 in San Francisco, CA. Those in attendance are listed at the end of the minutes as Attachment 1. The Chair, John Smythe (Iowa DOT), began the meeting by welcoming everyone to the meeting and passing out the agenda for the meeting.

John suggested starting the meeting by recapping current activities. David Raynaud provided an update on NCHRP activities. One of the active NCHRP projects is NCHRP 10-83, Alternative Quality Systems for Highway Construction being conducted by the University of Colorado. Keith Molenaar is in the testing phase of the guidebook. Some of the new projects, which have not yet been awarded include NCHRP 10-93, Methods for Characterizing Roughness of Urban Pavements; NCHRP 10-92; Risk Assessment of Materials Inspection, Testing, and Acceptance Practices; and NCHRP 10-91, Integrating Sustainable Practices and / or requirements into Construction Activities. Another of the new projects, NCHRP 10-90, Guidelines for Complying with EPA Effluent Limitation Guidelines for Construction Runoff, has been put on hold because it is redundant with other efforts. NCHRP 10-89, Determination of Best Practices for Optimal Construction Inspection is just getting started.

Keith Molenaar then discussed the status of pooled fund TPF-5(260), Next-Generation Transportation Construction Management. This pooled fund is an outgrowth of a 2004 international scan on construction management and is an avenue for State highway agencies (SHAs) to have buy in into the effort. It is led by Colorado DOT and provides a means to share best practices. It acts as a bridge between longer term (NCHRP) research and current activities. The funding for the pooled fund is just coming through this year and they are just starting the first project to develop a guidebook that discusses highway project delivery methods and alternative contracting strategies. This project will be completed June 2014. More SHAs are welcome to join the pooled fund. The scope of the pooled fund includes doing synthesis (quick hit) projects, implementation activities, and travel for meetings. Because of CDOT's ability to award projects quickly, the pooled fund can identify a need and pull the trigger quickly. This enables focusing on our problems of today. The pooled fund has yet to decide whether they will sponsor another Transportation Construction Management (TCM) conference. John encouraged others to consider participating – this makes it more broad based. Further information can be found on the project website: http://www.colorado.edu/ceae/TCM/ .

James Bryant gave a quick SHRP2 update. Over 70% of the research is coming to fruition. AASHTO has an implementation task force. AASHTO and FHWA have met with SHRP2 to develop an implementation plan. Some of the projects on the implementation plan include R09, Managing Risk in Rapid Renewal Contracts and R10, Managing Complex Projects. These two projects will be having a combined implementation workshop next month. R10 will also have some pilots next year. Another project whose implementation starts in 2012 is R04, Bridge Design for Rapid Renewal. Some of the project included for 2013 starts include: R07, Performance Specifications for Rapid Renewal (draft report is due Sept 2012); R23, Long-Life Pavements and R15B Integrating Utility/Transportation. 2014 starts include R21, Composite

Pavement Systems and R05, Modular Pavement Solutions (working on a development plan and proposing some pilots for bridge underpasses).

It was noted that the SOC website is being improved. We can use that as a repository to link to other research efforts.

Technical Section Research Topics
The technical section vice chairs/representatives reported on the research topics identified during the various SOC technical sections meetings.

Roadways and Structures Section – David Hoyne (VT AOT)

- Caltrans put for the suggestion to explore what are others doing to manage impaired drivers in short term or mobile work zones
- Credentialing inspectors – both consultants and State. It would cover the costs (testing, travel) of doing so as well as regional standards and reciprocity. What acceptance plans to States use and how do they differ? This could be a synthesis.

Environment and Human Resources Section – Fran Hood (Idaho Transportation Department)

- They also discussed the credentialing of inspectors – they are supportive of Roadways and Structures taking the lead on this.
- Sediment and erosion control devices – how to evaluate and test them. Agencies are inundated with requests to get them on the qualified products list. Protocols for large scale testing do not exist. Greta Smith indicated that AASHTP's NTPEP is working on this. To participate in NTPEP evaluations, manufacturers pay to have their product evaluated. Idaho needs to report back on whether they work but nobody currently does. MI and WA also have requirements to report back and Pete Kemp at WI DOT is doing this. The suggestion was made to collect the examples from MI and WA and contact Pete Kemp to see where they are at.

Contract Administration Section – Brenda O'Brien (Michigan DOT)
One of the projects that was put forth last year and which was not selected was to develop a guidebook on best value procurement. They will collect information as a one stop shop, including SHA references and links. They will pull together what we have and this could supplement other work such as the TCM pooled fund.
Ideas that were put forth for research were:

- Digital dissemination of plans, interactive websites focused on contract administration – could be a synthesis.
- Use of videography and photography to track project progress. The building industry is doing this.
- Update NCHRP 10-58.
- Constructability reviews were also mentioned. There's a lot on designing for safety, sustainability and it fits with 3D modeling. Need to develop scope as a guide has already been developed. Perhaps it should be updated.

Computers and Technology Section – Don Greuel (Wisconsin DOT)
Two topics related to Civil Integrated Management (CIM) were discussed and handouts for each of these were distributed (attached as Attachments 3 and 4).

- NCHRP project on CIM**,** Assessing Highway Agency Readiness for Civil Integrated Management – This project would document the current state of the practice and readiness relative to the application of CIM throughout the project delivery process.
- Domestic scan on CIM – to examine projects that use CIM and partnering.

Each of these efforts would establish baseline on who is doing what. To utilize design files in construction you need some level of knowledge of the software. This is one of the challenges. This led to a discussion on how TransXML is related to CIM. TransXML provides a way to move the 3D models from one piece of software to another so that it is non-proprietary. By having a common schema there are more places where you can put the model. It gives you a better chance of getting it from design to construction. TransXML is a piece of CIM. Jeff Carpenter made the suggestion that the proposed NCHRP project address the issue of scalability. On what size project is using this cost effective? The domestic scan could also address this issue. It was also pointed out that the project from the Contract Administration section on the dissemination of contract information is related to the CIM project. It was also suggested that contractor be contacted as a part of the data gathering to see what they want from SHAs. Finally, it was suggested that the group first seek doing the synthesis to get sense of the state of practice and identify the States with the best information and then follow up with the domestic scan. The problem statement needs to describe how it is different from an earlier synthesis related to this topic.

Fran Hood brought up one additional item. The contractor community is looking for some standardization of project delivery systems. NCHRP 10-85 will be delivering a guidebook for CMGC. There is the AASHTO Design-Build procurement guide.

The group was then asked to discuss and rank the research that had been proposed. There is some overlap between technical sections on the credentialing suggestion. Fran is happy to let Roadways and Structures take it, and David agreed to be the lead.

Fran took the sediment control suggestion off the table. They will contact WA and MI.

Keith pointed out that the pooled fund has two ideas, digital information and accreditation, that relate to the ideas that have been discussed.

This leaves the following ideas:

- Impaired drivers: There have been a number of studies. Short duration workzones and mobile workzones – NCHRP 17-61 is ongoing and may overlap. Look into this first. Another AASHTO committee may also be interested or working on this. This topic does fit into the SOC strategic plan.
- Credentialing
- Digital dissemination of contract documents – synthesis
- CIM project (with contractor input) on what everyone is doing.
- Dusting off 10-58. This could be an NCHRP 20-07 project.
- Constructability

John stated that we need to put some meat on the bones of these ideas. That way, the group can be more informed before establishing priority.

Lastly, John brought up the organizational structure of the SOC research Steering Committee. Jeff Carpenter will assume the role of chair. Also, the technical sections have been asked to identify a person who can be pulled away from their tech section (not the vice chair) in order to have more time to devote to this steering committee.

The meeting of the Research Steering Committee was adjourned at 7:45 am.

Attachment 1

Agenda
AASHTO Subcommittee on Construction
Research Steering Committee
August 14, 2012
6:30 AM – 8:00 AM
Powell Room

Introductions

Recap of current research initiatives

- NCHRP-David Reynaud
- TRB-James Bryant
- Keith Molenaar- Transportation Pooled-fund program, Study Number: TPF-5(260) Next-Generation Transportation Construction Management

Reports from Technical Committee on future research needs

- Roadway and Structures
- Environment and Human Resources
- Contract Administration
- Computers and Technology

Prioritization of future research needs

- Ranking
- Development of Problem Statements-Lead person

Timeline for Submittals to NCHRP

- To be considered for the FY 2014 program, problem submittals must arrive by September 17, 2012 -- this is a firm deadline.
- Synthesis topics must be submitted by January, 2013.

Attachment 2

ATTENDEES

NAME	AGENCY	PHONE	E-MAIL
Katherine Petros	FHWA	202-493-3154	Katherine.Petros@dot.gov
David Hoyne	VT AOT	802-828-2593	David.hoyne@state.vt.us
Charles Jahren	Iowa State University	515-294-3829	cjahren@iastate.edu
David Reynaud	NCHRP	202-334-1695	dreynaud@nas.edu
Stu Anderson	TTI	979-845-2407	s-anderson5@tamu.edu
Fran Hood	Idaho Trans. Department	208-334-8426	Frances.hood@itd.idaho.gov
Don Greuel	Wis DOT	608-267-7774	Donald.greuel@dot.wi.gov
John Smythe	Iowa DOT	515-239-1503	John.smythe@dot.iowa.gov
James Bryant	TRB/ SHRP2	202-334-2087	jbryant@nas.edu
David Unkefer	FHWA	404-562-3669	David. Unkefer@dot.gov
Jerry Yakowenko	FHWA	202-366-1562	Gerald.yakowenko@dot.gov
Jeff Carpenter	Washington DOT	360-705-7821	carpenj@wsdot.wa.gov
Brenda O'Brien	Michigan DOT	517-322-1085	Obrienb2@michigan.gov
Cliff Schexnayder	Arizona State University	480-812-0924	Cliff.s@asu.edu
Kristen Parrish	Arizona State University	480-727-6363	Kristen.parrish@asu.edu
Greta Smith	AASHTO	202-624-5815	gsmith@aashto.org
Chris Harper	University of Colorado	303-887-3055	harperc@colorado.edu
Keith Molenaar	University of Colorado	303-735-4276	Keith.molenaar@colorado.edu
Gary Angles	Ohio DOT	614-466-7057	Gary.angles@dot.state.oh.us

Attachment 3

PROPOSED NCHRP PROJECT

Title: **Assessing Highway Agency Readiness for Civil Integrated Management**

Scope: The use of Civil Integrated Management (CIM) by state highway agencies has the potential to dramatically improve the delivery of infrastructure projects. 3D design and Building Information Models in the vertical construction industry is well understood, with many documented benefits. Many of these same benefits can be achieved in the public transportation sector. Potential benefits include: effective integration with remote sensing technologies (such as LiDAR); improved design efficiency and collaboration through use of virtual design and construction; improved communication of design with stakeholders through use of visualization tools; more accurate material quantities; improved clash detection; ability of contractors to utilize design models for scheduling, estimating, and Automated Machine Guidance (AMG); and use of an as-built model for post-construction asset management.

As agencies move to utilize CIM principles for delivery of highway projects, there is a need to better understand the barriers that must be overcome prior to full implementation. Several studies have been conducted into areas such as 3D design or AMG, but there is a need to document the current state of the practice and readiness relative to the application of CIM throughout the project delivery process including survey, design, contracting/advertisement, construction, final acceptance and operations/asset management.

Information to be compiled includes:

- Equipment and software being utilized by agencies for virtual design and construction
- Utilization of 3D modeling and simulation to optimize construction engineering and constructability planning, including construction means and methods
- Utilization of integrated construction management systems (quality assurance, scheduling/earned value/progress reports, electronic documentation files, electronic signatures for pay estimates, project close-out)
- Long-term storage of survey point cloud data and digital design/as-built models
- Legal/liability issues related to sharing 3D design information during design and construction
- Potential impact of CIM implementation on existing organizational structure and culture at agencies
- Roles of various partners in delivering CIM

The information gathered includes:

- A literature review documenting existing applications of CIM concepts by highway agencies.
- Survey of highway agencies to identify the awareness, readiness and barriers to increased use of Civil Integrated Management. CIM impacts many different parts of a highway agency and the survey should ensure that those different functions are included.
- Identification of case studies documenting the costs, benefits and barriers to implementation of CIM.

The project report would address the current state of readiness and barriers related to use of CIM. The report will also identify critical knowledge gaps and offer insight for follow up efforts to fill those gaps.

Information Sources:

- State highway agencies and their consultants leading in this technology
- NCHRP Project 10-77, *Use of Automated Machine Guidance in the Construction Industry*
- *KDOT's Evaluation of Sharing Electronic Data with Contractors and GPS Construction Processes*
- National Center for Freight & Infrastructure Research & Education, University of Wisconsin–Madison, *3D Design Terrain Models for Construction Plans and GPS Control of Highway Construction Equipment*
- *Planning the Implementation of Three-Dimensional Technologies for Design and Construction*, Wisconsin Department of Transportation. In *Transportation Research Record: Journal of the Transportation Research Board*, No. 2183, Transportation Research Board of the National Academies, Washington D.C., 2003, pp. 129-138.
- *MDOT Implementation Plan for GPS Technology in Planning, Design and Construction Delivery.* Publication FHWA/MS-DOT-RD-07-178. Federal Highway Administration and Mississippi Department of Transportation, 2010
- *TRB committees* – Construction Management, Information Systems, Visualization.

AASHTO THE VOICE OF TRANSPORTATION **Domestic Scan Proposal Form**

AASHTO is soliciting topic proposals for a Calendar Year 2013 US Domestic Scan Program (NCHRP Panel 20-68A). Each selected scan topic will be investigated through site visits to three to six locations for approximately a two week period or less (type 1), by webinar (type 2) or peer exchange (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.

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, 2012.

Proposal Contact Information

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

Title of Proposed Scan

Civil Integrated Management (Cim)

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

With limited resources and public expectations higher than ever, all parties to highway construction projects must work together and utilize emerging intelligent construction technologies and partnering for the fast, efficient, and safe delivery of projects. FHWA and the three national associations—AASHTO, ARTBA, and AGC—are jointly promoting "Civil Integrated Management" (CIM) to highlight these types of resources.

The purpose of this scan is to examine projects that utilize CIM technologies and partnering efforts between State DOTs, consultants, contractors, and materials suppliers. Over the past 20 years we have seen a dynamic evolution in the use of computers to assist in highway construction efforts. Whether it is the computer driven total station, laser guidance systems,

automatic machine guidance systems, 3D, 4D, or 5D modeling of complex construction strategies, or remote modeling of assemble of bridge elements, we have the potential to be working more efficiently and accurately than ever before. In addition, with the evolution of contract administration from the design-bid-build of telling the contractor how and what to build, we are now using contract administration tools that have the potential to enhance partnering between owners, consultants, materials suppliers, and contractors to optimize just in time delivery of services and materials. However, with these advancements in technology and relationships there still is a lack of understanding the art associated with brining the right team, technology, and project together for optimum efficiency and productivity.

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 scan will consider organization factors (e.g. size of program degree of centralization or decentralization, and outsourcing) that may influence a state DOT, consultant, materials supplier, or contractors' ability to utilize CIM. Many states, some consultants, contractors, and materials suppliers have used individual technologies and forms of partnering, but a limited few have taken CIM to the level of utilizing project management systems in a data cloud environment, with alternative contracting, innovation in survey, information modeling for construction, innovations in subsurface utility work, and utilizing real time verification. This project will identify a sample of these CIM type projects from across the nation for the scan. During the scan, interviews will occur with project management, design, materials suppliers, and construction staff to assess the effectiveness of the technology and partnering efforts is in achieving the state DOT's, consultants, materials supplier, and contractor performance measures and goals.

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 results of this scan will be the identification of when and where to effectively employ intelligent construction technology in an effective manner to achieve desired performance goals. In addition, the results will identify effective means of partnering between state DOT's, consultants, contractors, and materials suppliers in utilizing intelligent construction technology to work toward common performance goals.

The final report of the scan will contain an overall synopsis of scan visits and individual project visits with conclusions focusing upon:

- Identified proven intelligent construction technologies that should be further deployed,
- Common construction project performance measures for state DOTs, consultants, materials suppliers, and contractors, and
- Successful techniques of partnering in this new age of virtual meetings, wireless data sharing, and paperless communication.

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

The benefits of this scan will be the accelerated deployment of highway construction projects utilizing emerging intelligent construction technologies and partnering for the fast, efficient, and safe delivery of projects. This will directly equate to cost and time saving with improved productivity for design and construction activities of highway projects.