

2011 Research and Technology Transfer Committee-Iowa
February 23, 2011

MINUTES

Present

Harry Allender	Allender/Butzke
Chris Anderson	Iowa DOT
Chris Brakke	Iowa DOT
Jim Cable	Cable Concrete Consultant
Mark Dunn	Iowa DOT
Jim Grove	FHWA
Todd Hanson	Iowa DOT
Brian Keierleber	Buchanan County
Ron Knoche	City of Iowa City
Jeff May	City of Knoxville
Kevin Merryman	Iowa DOT
Shashi Nambisan	InTrans – Director
Lubin Quinones	FHWA, Iowa Division
Greg Reeder	City of Council Bluffs
Gordon Smith	ICPA
Dave Suchorski	Ash Grove Cement Co.
James Webb	Iowa DOT
Bob Steffes	CP Tech Center
Halil Ceylan	CP Tech Center
Fatih Bektas	CP Tech Center
Kejin Wang	CP Tech Center

Absent

John Adma	Iowa DOT
Jim Alleman	ISU CCEE
James Berger	Iowa DOT
Joe Clendenen	Holcim
Bob Dawson	Iowa DOT
Jim George	Dallas County
Tom Green	Allied Construction Co., Inc.
Jon Hanson	City of Ankeny
John Joiner	City of Ames
Robert Kieffer	Boone County
James King	Fayette County
Sandra Larson	Iowa DOT
David Patterson	Washington County
Tom Rohe	Plymouth County
Lisa Rold	FHWA, Iowa Division
Mark Trueblood	Martin Marietta Aggregates
Rick White	Howard R. Green Co.
Paul Wiegand	CP Tech Center

Admin Group

Tom Cackler	CP Tech Center
Peter Taylor	CP Tech Center
Dale Harrington	CP Tech Center
Sabrina Shields-Cook	CP Tech Center
Melisse Leopold	CP Tech Center

The Research and Tech Transfer-Iowa Committee of the National Concrete Pavement Technology Center met on Wednesday, February 23, 2011, at the ISU Institute for Transportation in Ames.

Tom Cackler welcomed the committee and asked the group to go around and introduce themselves. Dale Harrington pointed out the agenda and booklet to follow throughout the meeting. Dale mentioned there will be some changes made to the committee as some members have asked to be removed as they have been serving for many years. He will contact the appropriate agency representatives to obtain new members.

Research Completed / in Progress

CP Tech Center

Tom Cackler updated the committee on the CP Tech Center's activities. He stated the Center has a lot of research and tech transfer partners throughout the country. The CP Road Map helps to guide the research activities. Tom gave an overview of some of the topics that the Center has been working on over the past couple of years and some of the projects that are currently ongoing. Tom pointed out one of the tools available is the ACPA website database of the overlays across the country (several thousand projects). Gordon Smith stated that some of the Iowa projects are still being uploaded to the database.

Tom gave an overview of the Concrete Overlay Program and one of the gaps is overlay design. He stated the Center is completing a manual on design methodologies. Tom mentioned that concrete preservation is a good program especially with the funding cutbacks that have taken place the past couple of years. He stated the preservation training program is very helpful for states. Tom stated all the reference materials can be accessed on the CP Tech Center website: <http://www.cptechcenter.org/>. They can also contact the Center directly and they will send the materials to them.

Tom gave an overview of some of the manuals and guides that will be coming out this year through the Center. He also stated that there will be a Surface Characteristics workshop in March 2011 to discuss some of the research findings

Peter Taylor discussed the joint deterioration research that is being done by the Center. He stated there has been a lot of testing in this area. Peter stated some of the joint deterioration is caused by mechanical issues with traffic and some of the deterioration happens because of the sawing of the joints. Peter stated further research needs to be done on damage due to saturation, air void stability, and internal curing. He also stated the need to do a trial bridge deck test.

Iowa Research TR600

Jim Cable gave an overview of improving concrete overlay construction projects and the main topics that were examined on the projects. Jim went through four of the projects that were reviewed in Iowa. He discussed some of the findings from the Iowa projects. Jim emphasized that owner, contractor/resident communications are essential to overlay construction success. Jim stated that how to make bridge approach replacement go quicker needs some improvement. Jim encouraged the committee to come out to see the Hwy 18 project this spring. The late start date is April 4th.

Iowa Highway Research Board Process

Mark Dunn gave an overview of the IHRB process and guidelines. He explained the funding and ranking process. Mark stated usually 8 to 10 projects are funded off of suggested project lists received from entities throughout Iowa. If a submitted project receives at least one vote from the Board the project will go back into the list of topics for the following year. If a project does not get at least one vote it is removed from the list. Mark suggested limiting the total projects submitted to 3 to 5 project topics as they may get better consideration by IHRB. He suggested looking at last year's topics and let him know if they should be resubmitted. Pick the top 4 and push those forward. Don't have to be in any certain order. Need a short paragraph on the need for the project. Don't combine several project ideas together into one as the scope and funding becomes too large. Typically projects \$100,000 to \$150,000 funding range have the

best chance and it helps to have co-funding available for the project. Additional information regarding the IHRB process and guidelines is available on their website:
http://www.iowadot.gov/operationresearch/iowa_highway_research_board.html.

New Proposals for IHRB Consideration

Dale Harrington pointed out the lists included in the handout packet (No. 3) for the committee to review and look at for suggested topics for funding.

Jim Grove presided over the discussion on new research and priorities. He asked the committee to look at what research projects would help them with problem areas and issues they deal with. The committee were handed out slips of paper and asked to write three or more research projects they felt were important. After their suggestions for future projects were handed in the topics were listed on the whiteboard. Some of the topics were combined as they had similar scope. The committee then voted on which topics they felt had the highest priority. Following each topic listed below is the amount of votes the topic received by the committee:

Potential Project	#Votes
• Joint Deterioration Causes	16
• Subbase Drainage Systems	12
• Cost Effective Pavement Systems	10
• Structural Benefit of the Safety Edge	10
• Air Void Stability	9
• Street Creep	7
• Internal Curing	7
• Patching without Chlorides	5
• Moisture in Concrete	3
• Transitions at Structures (bumps at)	2
• Recycled Materials in Concrete	2
• Joint Sealing Effects	1
• Surface Prep for Bonding PCC	1
• Workability Measurement	1
• Detecting Voids under Pavement	1
• Cost Effective Stringless Paving	1
• Adequacy of Pre Overlay Surface Mapping	1
• Uniformity of Concrete Batching	1
• Cracking and Mix Design	
• Repair at Raveled Joints	
• Effects of Concrete Pumping on Air	
• Long Term Effects of Grinding & Cost Effectiveness	
• Keyway Placement	
• NDT for W/C Synthesis	
• Weather Effects on Chemical Admixtures	
• Curing for Cold Weather Paving	
• Development of PCC Highway Rating System	
• Relationship between MRO Strength, and MRE	
• Optimum Strength for Opening Overlays (2009)	
• Longitudinal Tining Tolerance	

These top 5 topics will be considered for submittal to IHRB:

1. Joint deterioration Causes – 16 votes

Joint Deterioration – Concrete joint deterioration is a serious problem throughout the U.S. and in particular cold-weather states. Currently there is a \$935,000 national study being conducted by the National Concrete Pavement Technology Center at ISU to try to solve this problem. The study is being funded by a number of participating states through a pooled fund process and through a cooperative agreement with FHWA. Additional funding has come from industry. So far, the study has found that one common theme in numerous joint deterioration situations is the water saturation of the joint. To help solve the saturation problem it is important that the moisture state in and around the joints be measured and monitored, including the subbase. Since Iowa has a number of these saturated joints and the current pooled fund study does not cover the measurement of the moisture, the committee desires to seek Iowa Highway Research Board support. In addition, there are a number of questions about the damage caused by the sawing of joints. This would also be included in the research proposal to IHRB. The results of other research would be submitted to the IHRB and be included in the national study.

2. Subbase Drainage Systems – 12 votes

Joint Drainage – As part of the concrete joint deterioration solution it is critical to understand why water is sitting in joints and to institute methods to get water out of the joints, which is the main cause of freeze thaw damage of concrete joints. The committee desires a “how to” guide that addresses the proper design and construction of a cost-effective drainage system that includes joint width, sealing, subbases and segregation issues, sub drains and maintenance. The purpose of the guide would be to address bottom up and top-down drainage. Project No. 1 and 2 may be combined into one submittal to IHRB.

3. Cost Effective Pavement Systems – 10 votes

Cost Effective Pavement System – many cities and counties in Iowa are faced with marginal or poor natural subgrades to place pavements on. There is a wealth of knowledge available on how to treat poor subgrades, but there is not a comprehensive guide on how to determine a cost effective pavement system given particular soil problems. The guide needs to include cost and description for the best-performing combination of concrete thickness, granular or cement treated subbases, geo-grid systems and soil stabilization. This would include the benefits derived from the system including increased longevity based off of historical data.

4. Structural Benefit of the Safety Edge – 10 votes

Structural Benefits of the Highway Safety Edge – The new regulation for the highway safety edge are now available for implementation. Since the safety edge will be constructed in many cases there is a need to determine if there is a structural benefit from the safety edge that can help reduce the pavement thickness and possible costs. Also the safety edge benefits need to be compared to the benefits received from a tied concrete shoulder or widening unit.

5. Air Void Stability – 9 votes

Air Void Stability – It is a well documented fact that entrained air in concrete helps reduce freeze thaw damage. However, inconsistent air content does exist between plastic concrete tests and in-place hardened concrete air tests at joints. Research needs to be

completed to determine why there is such a change, including the accuracy of the air measurements in a plastic state, the loss of air void system during transportation and placement considering delivery and haul distances, and variable admixture types.

Technology Transfer

Tech Documents

Sabrina Shields-Cook gave an overview of the tech materials the CP Tech Center has developed over the past year (listed below and included in the handout).

Tech Transfer Summaries:

1. Improving Concrete Overlay Construction

Tech Briefs:

1. The Language of Noise
2. What Makes a Quieter Pavement?
3. Measuring and Defining Texture with RoboTex

MAP Briefs:

1. Deleterious Chemical Effects of Deicing Solutions on Concrete Pavements
2. Stringless Concrete Paving
3. Roller-Compacted Concrete Pavements
4. Two-Lift Concrete Paving
5. Job-Specific Optimization of Paving Concrete with COMPASS
6. Diamond Grinding to Reduce Tire-Pavement Noise in Concrete Pavements
7. Use of Nonwoven Geotextiles as Interlayers in Concrete Pavement Systems

Upcoming Manuals/Guides:

1. Integrated Pavement Solutions
2. Partial-Depth Patch Repair

Sabrina stated all of the tech briefs are available on the CP Tech Center's website:

<http://www.cptechcenter.org/>. Dale stated they could also contact either him or Sabrina and they would send them the materials or they could put their names on the list provided in the handout and they would get them the materials. Sabrina explained the e-news and MAP Briefs that are being developed through the CP Road Map program. She asked the committee to let her know if they wanted to be added to the email list for the link to the e-news and MAP Briefs. The MAP Briefs and e-news can be accessed on the CP Road Map website: www.cproadmap.org.

Tech Modules

Chris Anderson gave an overview of the web based training that has been developed by the CP Tech Center in cooperation with TCCC and NHI. All the TCCC training is free. If you go into the NHI site you have to get a TCCC id to proceed with the free training. Chris stated the list of the training modules that are currently available are in the handout. They can be taken as a series or as individual modules. Chris distributed to the committee the process on how to get onto the NHI site for the training modules. She stated you can also access the training through the Iowa DOT site: <http://www.iowadot.gov/training/index.html>. Chris stated TCCC works with the CP Tech Center on updates for the training which are done every two years. She stated that any manual that is developed can be made into web based training. The modules are very interactive, you don't need any special equipment on your computer and downloads are free. Chris stated

that some of the upcoming training modules are bridge inspection course, RCC course (advanced and testing), and erosion control. All the web based training is available on the Iowa DOT training site and the NHI training site.

Tech Transfer Topics

Dale Harrington pointed out the documents in the handout that listed the past regional lunch hour forum topics that have been covered over the past several years. He asked the committee to review the topics and to think about new topics that they would like to see considered for future regional forums for 2011. Dale asked the committee to review the list and then mark their priorities. The committee reviewed the list and marked which topics they felt were the top five priorities for future presentations which were compiled after the meeting. The following topics received the most votes and will be covered in future "Lunch and Learn" forums offered quarterly in each Iowa district:

1. Joint Resealing and Crack Sealing
2. **Three subjects tied:**
 - Joint Deterioration
 - Stringless Paving
 - Surface Characteristics
3. Concrete Cracking
4. **Two subjects tied:**
 - Increasing the Sustainability of Concrete Pavements
 - Concrete Pavement Preservation; Curing and Crack Reduction
5. **Three subjects tied:**
 - Contractor input/suggestions for design, construction, etc.
 - Building Sustainable Pavements with Concrete
 - New and Promising Technology for Concrete Pavements
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Dale stated the other Iowa one and two-day workshops offered in 2010 were included in the handout packet to the committee. He asked the committee to review the past Iowa workshops and to send him subjects to present in the future.

The meeting adjourned at 2:00p.m.