

2012 COUNTY ENGINEERS RESEARCH FOCUS GROUP

“GETTING THE JOB
DONE!”

FEBRUARY 22, 2012



INTRODUCTION

The Iowa Department of Transportation (DOT) and Local Technical Assistance Program (LTAP) held the second annual County Engineers Research Focus Group (CERFG) meeting in Ames, Iowa on February 22, 2012. The attendance at the meeting was approximately 50 people and its theme was “Getting the Job Done”. Presentations during the meeting, among other things, summarized the results of the CERFG meeting in 2011, the value of research to the counties, specific research projects, and several relevant technical topics of interest. During the roundtable sessions the day-to-day challenges currently encountered by county engineers were also discussed and some low-cost innovations presented. The meeting concluded with the identification and prioritization of new research and outreach ideas.

MEETING OVERVIEW

The first half of the 2012 CERFG meeting started with opening remarks. Attendees were welcomed and everyone was introduced. Then, the 2011 CERFG meeting results and related ongoing research efforts were summarized and the value of the CERFG meeting to the counties and lessons learned from the 2012 Transportation Research Board (TRB) annual meeting presented. Technical presentations about three topics of interest were also completed. The topics included:

- Pavement Management Methodologies
- Western Iowa Missouri River Flooding Research
- Removal of Signs

Roundtable discussions were also held between each of the presentations above. These discussions focused on day-to-day challenges mentioned by the county engineers.

During lunch, low-cost innovations and cost-cutting ideas used by the counties were discussed. In the afternoon, three breakout groups were formed to identify and prioritize the research ideas and outreach tools that the counties believed should be considered for potential funding in the future. A subset of the ideas/tools suggested during the breakout groups were then prioritized by all the meeting attendees.

The opening remarks and presentations made during the 2012 CERFG meeting are briefly summarized in this summary along with the results of the research/outreach prioritization effort.

OPENING REMARKS

Welcome and Introductions

Opening remarks at the 2012 CERFG meeting were provided by Nicole Fox and Charlie Purcell from the Iowa DOT Office of Local Systems. Nicole explained that the CERFG meeting

was developed to provide counties with a venue to discuss the day-to-day challenges they experience along with the innovative responses they had developed, but also to gather research ideas that are relevant to the counties and might be considered by the Iowa Highway Research Board (HRB). Charlie welcomed everyone to the meeting and thanked them for their attendance. He also noted that while the overall goal of the meeting was to identify and prioritize research/outreach opportunities, the attendees were also there to discuss practical ideas. He then had all the attendees introduce themselves.

2011 CERFG Meeting Summary and Related Ongoing Research

The first speaker on the agenda was Vanessa Goetz. Vanessa is the Secondary Road Research Engineer in the Iowa DOT Research and Technology Bureau. She summarized the results from the 2011 CERFG meeting and some of the results since that meeting. She noted that the content of the 2011 CERFG meeting has been documented and that the report was posted at <http://www.iowadot.gov/operationsresearch/countyfocusgroup.html> (along with videos of some of the presentations). Vanessa reiterated the idea that the CERFG meeting was developed as a forum for county engineers to share their day-to-day challenges, share low-cost innovations to meet those challenges, and to brainstorm and prioritize research/outreach ideas for the Iowa HRB. The website developed for the CERFG meetings will facilitate the transfer of its results.

Vanessa also talked about the current status of a research idea that was suggested as a top priority at the 2011 CERFG meeting. She shared and discussed the content of a draft request for proposal (RFP) that was developed for “Standard Abutment for Pre-Cast Bridges” (the subject noted during the CERFG meeting last year). The draft RFP was entitled “Standards for 40’-0 to 70’-0 span Non-prestressed, Precast Bridges with High Abutments” and one of the stated objectives of the research was to develop design standards for non-prestressed, precast slabs, for 40’-0 to 70’-0 spans with steel sheetpile abutments. Another of objective is the development of design standards for cast-in-place and precast bridge abutments. Vanessa indicated that this draft RFP would be discussed at an upcoming Iowa HRB meeting and asked for volunteers to review it. John Ites (Buena Vista County), Brian Keierleber (Buchanan County), Patrick Mouw (Ida County), and Lee Bjerke (Winneshiek County) agreed to review the draft RFP and finalize its focus.

Vanessa concluded her presentation by identifying three related research projects that might be of interest to county engineers. The titles of these projects included:

- Evaluation of the Buena Vista IBRD Bridge: A Furthering of Accelerated Bridge Construction in Iowa,
- Precast Concrete Elements for Accelerated Bridge Construction, and
- Modified Sheet Pile Abutments for Low Volume Bridges.

A technical transfer summary for each of these research projects was provided to the attendees and Vanessa noted that these summaries and the project reports could be found at

<http://www.iowadot.gov/operationsresearch/reports.aspx>. She indicated that the most highly ranked research subjects from the CERFG meeting this year would also be presented to the Iowa HRB for its consideration.

How Will this Meeting Help the Counties (Todd Kinney – Clinton County)

The next presentation at the 2012 CERFG meeting was given by Clinton County Engineer Todd Kinney. Todd is the 2012 President of the Iowa County Engineers Association (ICEA). Todd explained how the results of the CERFG meetings can help county engineers and he used himself as an example. He indicated that he had used no less than 10 Iowa HRB project reports in the past year and that he believes the benefit of Iowa HRB projects is in the application of their results. Todd also said that the Iowa HRB provides a vital service to local engineers because it helps find solutions to local problems. He concluded his presentation by indicating his support for the CERFG meetings because they help identify future research projects and ideas. He also noted that the discussions at these types of meetings directly benefit county officials and the results assist the Iowa HRB with its efforts.

Update on TRB – Research Around the Country (Wade Weiss – Greene County)

Wade Weiss, Greene County Engineer and a long-term member of the Iowa HRB, summarized the benefits of, and what he learned, at the 2012 TRB annual meeting. He indicated that there was great value in attending the TRB annual meeting because it allowed national research results and ideas to come back to Iowa. TRB annual meetings include more than 4,000 presentations and papers and Iowa is well represented every year. Wade indicated that there were several subjects that seemed to be major points of discussion at the 2012 TRB annual meeting. Sustainability was one focus subject area at TRB and Iowa, of course, has been using this type of approach for some time through its reuse of aggregate and materials. Some of the other focus subject areas at the TRB annual meeting also included public transportation, railways, and pedestrian/bicycle issues. In addition, older drivers, traffic operations, and adverse weather impacts were discussed. Wade also provided an example of how he had used several research-related ideas at a bridge in his own county. The bridge was not only built with some nice aesthetics but also produced materials that were used in other projects. Wade concluded his presentation by indicating that the work of the TRB Low Volume Roads Committee was very relevant to Iowa and that Keith Knapp was a member. He indicated that LTAP and the ICEA Service Bureau would be good venues for getting the research ideas from TRB and the Iowa HRB to the local agencies in Iowa.

TECHNICAL PRESENTATIONS

Three presentations that focused on specific technical subjects, projects, or issues were also given at the 2012 CERFG meeting. These presentations are summarized briefly below and showcased in videos that will be available on the Internet at <http://www.iowadot.gov/operationsresearch/countyfocusgroup.html>.

Pavement Management Methodologies – The Hard Truth (Nicole Fox – Iowa DOT)

This presentation was developed by Zachary Gunsolley, Ringgold County Engineer, with the assistance of Brad Skinner, Page and Montgomery County Engineer, and Larry Mattusch of the Asphalt Paving Association of Iowa (APAI). Zachary was unable to attend the CERFG meeting, however, and the material was presented by Nicole Fox of the Iowa DOT Office of Local Systems.

The primary focus of this presentation was the Ringgold County sealcoat roadway system. First, Nicole summarized a number of factors that have resulted in the degradation of sealcoat roadways in recent years. Some of these factors included summer floods, harsh winters, and larger agricultural vehicles and machinery. There has also been a dramatic increase in the cost of materials needed for sealcoat roadways maintenance (e.g., more than a 22 percent increase in the cost of sealcoat oils), but the funding for these efforts have generally failed to keep pace. The different costs of maintaining various roadway surfaces were presented. In response to this situation, a point system was developed to guide the decision-making and prioritization of sealcoat roadway maintenance. The seven factors included in this prioritization system were traffic counts, road classification, system continuity, proximity to town, number of residents impacted, number of businesses/churches impacted, and terrain and maintenance issues. It was noted, however, that without a general increase in funding the level of service for maintenance along sealcoat roadways are likely to decrease. Some counties have already begun to reduce the amount of sealcoat roadway mileage they maintain by changing these roadways to gravel.

Western Iowa Missouri River Flooding Research (Vanessa Goetz – Iowa DOT)

The second technical presentation summarized the goals, objectives, and some interim results of the HRB project TR-638 – “Geo-Infrastructure Damage Assessment, Repair, and Mitigation Strategies.” This research is being completed by D. White, D.K. Miller, and P. Venapusa of Iowa State University and is expected to be complete in June 2012. The presentation at the 2012 CERFG meeting was given by Vanessa Goetz, Secondary Road Research Engineer in the Iowa DOT Research and Technology Bureau.

The focus of the TR-638 project is an investigation of the geo-infrastructural damage related to the Missouri River flooding that occurred in western Iowa during 2011. The flooding appears to have resulted in damage to bridge foundations, pavements, culverts, unpaved roads, and embankments. This damage also occurred in a number of counties and impacted hundreds of roadway miles. Some of the damage, however, is not easy to determine visually. The goals of the TR-638 project, therefore, are to assess the damage to the geo-infrastructure along selected segments of these roadways; propose repair and mitigation strategies and emergency response criteria; and, produce a guide for flood damage assessment. At the time of the 2012 CERFG meeting the research team had met with county personnel, completed a field reconnaissance survey and selected roadway segments for in situ testing and monitoring, reviewed aerial imagery of the affected areas, and conducted in situ testing.

Several in situ tests are to be completed as part of this project to quantify and evaluate roadway support capacities and settlement problems over time by conducting periodic follow-up testing. These tests will include falling weight deflectometer (FWD), dynamic cone penetration (DCP), ground penetrating radar (GPR), 3D laser scanning, and additional evaluation of aerial imaging. Some preliminary test results from flooded and un-flooded areas in Pottawattamie County were presented. The flooded areas were identified by a visual assessment and their boundaries developed through aerial images and field observations of dead grass and roadway damage. In some cases, the flood waters have flowed through roadway foundation layers, created weep holes, and subsequently caused erosion. In a test section, FWD testing showed a 52 percent decrease in elastic modulus in a flooded area compared to an adjacent area that was not flooded. DCP testing also illustrated a decrease in foundation support conditions in flooded areas. In areas where surface gravel was washed out and the underlying subgrade was very soft, newly placed gravel layer showed rutting under traffic. Testing in these segments is planned for before and after the spring-thaw season in 2012, and during the summer of 2012 to evaluate the performance of flooded areas in comparison to the un-flooded areas. This research will be useful to decision-makers that need to prioritize roadway repairs, select appropriate assessment technologies and repair strategies.

Removal of Signs (Mark Dunn – Iowa DOT)

The third technical presentation focused on sign removal. The presentation was given by Mark Dunn of the Iowa DOT Research and Technology Bureau. The first part of the presentation summarized the results of a sign removal research project funded by the Iowa HRB. The second part was a discussion of the sign management approach (which includes sign removal) in Linn County, Iowa.

In 2005 Iowa HRB project TR-527: “Guidelines for Removal of Traffic Control Devices in Rural Areas” was completed. The primary objective of this project was to assess the safety performance of stop-controlled versus uncontrolled intersections on ultra-low-volume (< 150 daily entering vehicles) unpaved roadways. The project team also worked to analyze the impacts of varying levels of stop sign use and develop criteria that could be used to assess the potential impacts of excessive use. The project researchers concluded that for ultra-low-volume unpaved rural roadway intersections there was no adverse impact on safety performance due to the type of traffic control and that in some cases unneeded traffic control might be considered for removal. The details of the conclusions and suggestions from this project can be found in its report at http://www.iowadot.gov/operationsresearch/reports/reports_pdf/hr_and_tr/reports/tr527.pdf.

The details of the study and its content are important to the application of its results. The research team for this project also recommended a procedure for sign removal within the report. The procedure included the establishment of a formal policy, consultation with agency legal counsel and traffic control experts, a review of the Manual on Uniform Traffic Control Device applications of STOP and YIELD signs, appropriate public notice, and documentation and

a follow-up review. The current *Manual on Uniform Traffic Control Devices* (MUTCD) provides guidance for the installation of stop signs based on a number of criteria (e.g., sight distance).

The second part of the presentation focused on the sign management approach (which includes sign removal) in Linn County, Iowa (Note that Steve Gannon, Linn County Engineer, was unable to attend the 2012 CERFG meeting and Mark Dunn of the Iowa DOT Research and Technology Bureau also presented this information). First, a memorandum used for sign removals in Linn County was distributed to the attendees. Linn County has a program to review sign needs and a policy related to sign installation requests and removals. It is a comprehensive program of sign review, design, adjustment, and maintenance. Signs are reviewed after a citizen request, a safety data survey, and routinely with construction. Crash analysis is also used to determine some sign needs. In addition, signs are sometimes added based on a review of intersections and horizontal curves. Signs that have been installed based on engineering judgment are also reviewed regularly to apply what is currently known about sign effectiveness and impacts. During construction projects signs are removed, added, or upgraded. In general, Linn County has incorporated these processes as part of its sign program and removal is one option that is considered. The removal of signs is considered a necessary part of the program in order to manage this asset.

COUNTY ENGINEER “ROUNDTABLE” DISCUSSIONS

Brief roundtable discussions were conducted between each of the presentations described above. These discussions had a free-form style and any subject of interest could be introduced by the attendees. The following list includes the subjects that were noted and a summary of discussion that occurred.

- Subject: sharing research information with county engineers. It was proposed that Iowa LTAP was one method to complete this task. A Research Implementation Committee (RIC), however, helps disseminate local research in Minnesota. The RIC uses funding from the Minnesota Local Road Research Board to share local research results and complete related outreach. It was suggested that Iowa LTAP could also come to different DOT districts in the state and provide information about various research reports that are accessible and relevant to the counties. It was suggested that having a champion for research projects that knew the logistics of implementing the work would also be a good idea. Short YouTube videos showing the implementation of research results could also be done. There was also a discussion about how research reports could share implementation ideas. Vanessa Goetz, from the Iowa DOT, is looking for input on this entire subject. She also indicated that Iowa DOT will be offering local agencies the option to attend free TRB webinars at Iowa DOT offices when the subjects are focused on low volume roadways.
- Subject: decisions connected to using sealcoat or gravel. It was noted that the strength of the existing base course was an important input to this type of decision. The

use of base course was discussed and stabilization was suggested for heavily traveled roadways. The idea of converting roadways to gravel surfaces was also discussed along with the closure of roadways. It was noted that closing roadways would likely just increase the traffic on other roadways and these would need additional maintenance. It was also noted that sealcoat roadways begin to degrade when they crack and there might be approaches to limit the start of cracking (e.g., glass fibers in the emulsion).

- Subject: flooding issues. Some counties in Iowa recently had a large number of roadway miles under water for a long time (e.g., months). The FEMA involvement with the Missouri River flooding damage appears to have been somewhat variable (i.e., the approaches used seemed to vary). One attendee also indicated that the FEMA focus for bridge projects seemed to be whether any enhancements were being done. It was also noted that in another instance FEMA appeared to be requiring a particular type of bridge design that was no longer being used by the county. An inquiry was made about whether Iowa had standards for particular types of bridges.
- Subject: signing and sign removal. A Minnesota handbook on the removal and maintenance of signs was completed in 2010. This document provides guidance on the removal of signing. It also reviews and summarizes Minnesota tort law related to signing. A suggestion was made that something like this document was needed in Iowa. There were then short discussions about signing at uncontrolled and unmarked pedestrians crossings, deer crossing warning signs, and stop and yield signs at at-grade railroad crossings. Lastly, it was noted that there was no guidance available in Iowa for the adjustment of signing and pavement markings as the surface of a roadway was changed (e.g., the surface shifted from sealcoat to gravel or gravel to dirt).
- Subject: various topics. First, the repair and maintenance of watershed structures (e.g., dams) by counties was discussed. An inquiry was made about what responsibilities the counties had for these structures as they became damaged or degraded. A need to fund these types of repairs was noted. Second, the idea of precast bridge components (e.g., abutments) was discussed. It was noted that there was a need for standards that allowed something simple to be built within acceptable tolerances. The construction of bridge slabs with pre-stressing was discussed. Third, the need for more information about the life cycle costs related to pavement maintenance analysis and decisions was discussed. The timing of these types of decisions is important and more information would be helpful.

LOW-COST INNOVATIONS AND COST-CUTTING IDEAS

During the working lunch period the county engineers discussed some of the low cost innovations and/or cost-cutting ideas they are using. The subjects discussed included the use of fabric hoop salt sheds, downspout culverts, geosynthetic reinforced soil (GRS) abutments, the use of railroad flat car bridges, and road groomers. These subjects are described in detail,

and contacts provided, within the 2011 CERFG report from (see <http://www.iowadot.gov/operationsresearch/countyfocusgroup.html>).

A new innovation or cost-cutting idea that was mentioned this year included the use of “no snow removal” signs. These signs are used along roadway segments when winter maintenance is significantly reduced or eliminated for various reasons (e.g., segments that provide access to fields only or segments that have severe drifting but destinations served by an alternate access). County forces are not required to maintain roadway segments with these signs as passable through the winter. The clearing of these segments may be delayed until after all higher priority roads are cleared. Or, if the winter is severe enough, the County has the option of not attempting to open these segments and allowing the roadway to be opened naturally by the spring thaw. The “no snow removal” signs are permanent. They exist as a warning not to just the traveling public in the winter, but also to adjacent landowners and potential owners during the rest of the year. A number of factors need to be taken into account when signing roadways in this manner (Jack Moellering, Pocahontas County). Two methods that are used by counties when working with residents that push snow into the roadway were also discussed (e.g., fines and letters). There is Iowa Code related to this subject.

IDENTIFICATION/PRIORITIZATION OF RESEARCH AND OUTREACH TOPICS

The final segment of the 2012 CERFG meeting was used to identify and prioritize research and outreach ideas. Three breakout groups were formed and each group discussed and prioritized its ideas. A total of 25 subjects were developed by the three breakout groups (after overlapping subjects from the individual groups were eliminated). In some cases “champion(s)” were identified for a subject idea. These champion(s) will provide more information to the Iowa DOT if the subject is considered for research funding. The 25 subjects identified and the champion(s) (if identified) are listed below:

1. Sign Management/Removal with Iowa Law and Tort Liability Considered (Doug Miller, Kossuth County; Todd Kinney, Clinton County; and Lee Bjerke, Winneshiek County)
2. Need for Standard Policies and/or Plans Related to Bridge Replacement (Unknown)
3. Roadway Base Stabilization Techniques for Gravel and their Usefulness (Dave Shanahan, Cherokee County)
4. Maintenance Options and their Success for White Topping Degradation (Mitch Rydl, Audubon County)
5. Pavement Surfacing Options with Fiscal Constraints (or, Pavement Surface Asset Management Factors of Consideration) and Public Relations (Pat Mouw, Ida County)
6. Pavement Recycling/Reconstruction within Existing Right-of-Way (Dan Waid, Hamilton County)
7. Consideration of Horse-Drawn Vehicles & Revenues (or, Alternative Vehicle Use of the Roadway System) (Unknown)
8. Summary of Iowa Attorney General Decisions that Impact the County Road System (Roger Schletzbaum, Marion County)

9. Subbase/Subgrade Design Specifications or Guide for Roads and Load Capacity (Dave Shanahan, Cherokee County)
10. Bridge Design Standard for GRS Abutments (Ahmed Abu-Hawash, Iowa DOT)
11. Testing methods for Clay Content and Various Surface Stabilization Approaches (Jack Moellering, Pocahontas County; and Pat Mouw, Ida County)
12. Various Technical Transfer and Training Activities/Implementation Outreach
13. Criteria on How/When to Upgrade/Downgrade a Roadway Surface (Wade Weiss, Greene County; Kevin Mayberry, Mills County)
14. Investigation of Motorgrader Safety Issues for Various Conditions (Dave Shanahan, Cherokee County)
15. Roadway Vacation and Acceptance (Doug Miller, Kossuth County)
16. Timber Piling (Unknown)
17. Partial Depth Patching (Mark Dunn, Iowa DOT)
18. Base Stabilizing Treatments to Increase Strength (Brian Keierleber, Buchanan County)
19. Expediting the Review & Approval of the Environmental Review Process (Greg Parker, Johnson County)
20. Standards for Pier/Abutment Widening of Old Bridges – Rehabilitation Guidelines on the Reuse of Saving of Components (Todd Kinney, Clinton County)
21. Standards for RCBCs (and possibly CMP and RCP) Classified as Bridges (Brian Keierleber, Buchanan County; Todd Kinney, Clinton County)
22. Benefits of Internal Curing Concrete in Structures (Brian Keierleber, Buchanan County)
23. Guidelines on Sign Maintenance/Removal – Including an Iowa Legal Summary
24. Placement of Approach Guardrail on Low Volume Roadways (Vince Ehler, Iowa DOT)
25. Implementation/Education of Systemic Safety Improvements (Analysis of Safety Risk Factors on Low Volume Roads) (Brian Keierleber, Buchanan County; Keith Knapp, Iowa LTAP)

Each breakout groups was asked to prioritize its ideas and select three to four topics that they considered most important. These “top priority” subjects were then compared and if they overlapped with each other they were combined (sometimes resulting in a more general subject summary title). This process resulted in seven subjects that were prioritized by all the attendees at the 2012 CERFG meeting. The seven subjects and the total number votes each received are listed below. Each attendee was allowed to vote for a particular subject more than once (up to a maximum of four votes per topic).

- Guidelines on Sign Maintenance and Removal, Including a Legal Review of Iowa Tort Law and Liability in Iowa (60 votes)
- Roadway Stabilization (47 votes)
- Standards for Rating RCBC Classified as Bridges (i.e., HR-239 V) (34 votes)
- Criteria for How/When to Upgrade/Downgrade Roadway (31 votes)
- Subgrade Design Specifications / Design Manual (29 votes)
- Pavement Recycling/Reconstruction within Existing Right-of-Way (25 votes)
- Evaluate the Benefit of Internal Curing Concrete in Structures (21 (votes)

These ranked topics will be submitted to the Iowa HRB for consideration for FY13 research projects.

SUMMARY OF MEETING

The 2nd Annual CEFGR meeting included presentations about the results from the 2011 meeting, ongoing research relevant to counties, and discussions about low-cost innovations and cost-cutting ideas. Roundtable discussions about the challenges faced by county engineers were also held throughout the meeting. The meeting concluded with the development of breakout groups that identified and prioritized the research and outreach needs of the counties. The feedback at the 2012 CEFGR meeting was relatively positive and although improvements will be made it is expected that there will be CEFGR meeting in 2013.