



2014 County Engineers Research Focus Group

February 13, 2014

INTRODUCTION

The Iowa Department of Transportation (DOT) and Local Technical Assistance Program (LTAP) held the 4th annual County Engineers Research Focus Group (CERFG) meeting in Ames, Iowa on February 13, 2013. The attendance at the meeting was approximately 50 people. Presentations during the meeting, among other things, summarized the importance of research to counties, relevant ongoing and upcoming research, low cost solutions and ideas, and research implementation. A roundtable discussion was also held that focused on a number of day-to-day challenges currently encountered by county engineers, along with the actions they have taken in response. A significant portion of the meeting was, of course, committed to the identification and prioritization of new research and outreach ideas for the Iowa Highway Research Board (HRB).

MEETING OVERVIEW

The 2014 CERFG meeting was organized in a manner that allowed the discussion of low cost solutions and problems, research subject prioritization, and research result implementation. First, the attendees were welcomed and introduced themselves. The meeting continued with some opening remarks from Dan Ahart, the Shelby County Engineer and President of the Iowa County Engineers Association. Then, some ongoing and upcoming research efforts were summarized and various low cost solutions or innovations that have been identified nationally, regionally, and within Iowa were discussed. Information about several national and regional LTAP “Mouse Trap” competition winners, as well as Missouri Innovations Challenge winners, was included in the packet provided to the attendees.

Just before lunch, a number of research and outreach ideas were proposed and prioritized by the attendees. Six topics were selected for Iowa HRB consideration. This list, and the top research priorities identified, are provided later in this document. During lunch a series of roundtable questions/topics were also discussed and potential solutions or actions noted.

After lunch, the meeting included a short discussion on research result implementation. Two projects recently completed in Iowa were identified for further action. Finally, two examples of research result implementation were also described by two teams of researchers and county secondary road department staff.

The opening remarks, low cost solution and innovation discussion, prioritization results, and implementation presentations during the 2014 CERFG meeting are briefly summarized in this document.

OPENING REMARKS

Welcome and Introductions – Keith Knapp, InTrans

Opening remarks at the 2014 CERFG meeting were provided by Keith Knapp. Keith is with the Iowa LTAP and he explained the purpose of the CERFG meeting. He also indicated that it was developed to provide county engineers with a venue to suggest research and outreach ideas that might be considered by the HRB for further funding. In addition, the meeting is an

opportunity for Iowa county engineers to have roundtable discussions about their day-to-day challenges and some of the actions needed to address them. Keith concluded the welcome by having all the attendees introduce themselves.

ICEA Perspective – Dan Ahart, Shelby County

Dan Ahart, Shelby County Engineer, was the first speaker at the 2014 CERFG meeting. Dan is the President of the Iowa County Engineers Association and provided a county engineers perspective on the importance of the CERFG meeting. Dan indicated that the CERFG meeting was a good venue for county engineers to share research ideas and encourage more application oriented research projects and subjects. He noted that the meeting was also an opportunity for the county engineers to discuss common problems and the solutions that some individuals may have applied. Overall, the meeting was a good time to share ideas and to help the HRB identify subjects for potential projects.

RESEARCH PROJECT UPDATE

The second speaker on the agenda was Vanessa Goetz. Vanessa is the Secondary Road Research Engineer in the Iowa DOT Research and Analytics Bureau. Vanessa summarized some of the projects that have been funded as a result of the CERFG. She also identified the HRB and federally funded projects administrated by Iowa DOT (lists of these were provided to the attendees). In addition, she discussed a list of potential NCHRP synthesis projects, Transportation Research Board (TRB) annual meeting presentations that may be of interest, and described the unpaved roadway workshop held in Iowa during 2014. The HRB or federally funded projects Vanessa identified that were the result of the CERFG discussions included:

- Short Span Bridge Standards (TR-663)
- Low Cost Rural Road Surface Alternatives (TR-632) and ongoing Low Cost Rural Surface Alternatives: Demonstration Project in Hamilton County (TR-664)
- Analysis of Subbase Stabilization Techniques for Gravel Roadways (Federally funded and ongoing)
- Update of RCB Culvert Standards to LRFD Specifications (TR-620) w/ an addition to the software for culvert ratings that is ongoing
- Others that are or recently entered the Request for Proposals (RFPs) stage:
 - Impacts of Internally Cured Concrete Paving on Contraction Joint Spacing
 - Performance based Evaluation of Cost Effective Aggregate Options for Granular Roadways
 - Iowa Granular Road Design and Maintenance Manual

Overall, HRB completed 25 projects in 2012 and 2013. The HRB also started 22 projects during that same time period. In addition, there are five subjects, at the time of the CERFG meeting, that were being advertised through the RFP process. Vanessa also noted that the Iowa DOT used federal funds to support another 27 research projects in 2013.

Vanessa provided a summary of research and research-related activities that she thought might be of interest to the attendees at the CERFG. She noted that the TRB Low Volume Roads

Committee was involved with creation of proposals for three synthesis projects. The subjects of these synthesis were

- Metrics for Assessing the Impact of Preservation Projects on Low Volume Roads
- Preserving Unsealed Road Material Assets
- Reverting Hard Surfaced Roads and Pavements to Granular Surfaces

Vanessa also identified and listed 8 different presentations from the 2014 TRB Annual Meeting that covered subjects that might be of interest. The subjects of these presentations and the paper authors included:

- Modeling Low-Volume Road Operating Speed Using Artificial-Computational Intelligence (Mario De Luca)
- Investigating Safety Impact of Edge Line on Narrow Rural Two-Lane Highways by Empirical Bayes Method (Xiaoduan Sun)
- Simple Empirical Guide to Low-Volume Road Design (Karim Ahmed Abdel-Warith)
- New Procedure for Selecting Chemical Treatments for Unpaved Roads (David Jones)
- Collecting Decision Support System Data via Remote Sensing of Unpaved Roads (Richard Dobson)
- Research Using Waste Shingles for Stabilization or Dust Control for Gravel Roads and Shoulders (Thomas Wood)
- Performance of Chip Seals Using Local and Minimally Processed Aggregates for Preservation of Low Volume Roadways (Scott Shuler)
- Forty-year Study of Geotextiles on Unpaved Roads (Brian Howard Whitaker)

Vanessa concluded her presentation by identifying several resources related to low volume roadways. One resource was the video from Minnesota LTAP called “Gravel Road Maintenance: Meeting the Challenge”

(<http://www.mnltap.umn.edu/publications/videos/gravelroadmaintenance/>). The second resource she identified was the South Dakota LTAP “Surface Evaluation Guide for Gravel Roads”, and a third resource was the Road Dust Institute (and its posted documents) along with the “Unpaved Road Chemical Treatment Selection Tool”(See <http://www.ucprc.ucdavis.edu/dustcontrol/Default.aspx>). She included a screenshot of the tool in her presentation.

LOW COST SOLUTIONS AND IDEAS

The discussion following the research project update focused on the low cost solutions and ideas. This discussion was moderated by Lee Bjerke, County Engineer from Winneshiek County. First, Keith Knapp, the Director of the Iowa Local Technical Assistance Program (LTAP), presented and discussed the winners and several other national entries for the 2013 National LTAP “Better Mouse Trap” competition. The attendees were provided a booklet describing these and other state “mouse trap” entries. Booklets for entries to the 2013 regional LTAP “You Show Us” contest and the Missouri Department of Transportation “Innovations Showcase” were also provided the attendees.

Three presentations that focused on low cost solutions or innovations were then made by three Iowa county engineers. First, John Rasmussen, County Engineer of Pottawattamie County, discussed his proposed approach to data-based or performance-based gravel road maintenance. He introduced the idea of using several years of data from a “Rough-o-Meter” to determine performance and an incentive policy. John also suggested a research project be introduced and funded that focused on reclaiming, screening, and replacing aggregate surfacing on existing gravel roadways. A discussion of these ideas followed. JD King, County Engineer of Page County, then discussed the pavement rehabilitation approaches he has used along with this approach to pavement management. He noted and discussed the characteristics, advantages, and/or disadvantages related to the application and performance of several thin maintenance surface options (e.g., fog seals, chip seals, slurry seals, and microsurfacing). JD also provided a handout summarizing the pavement management approach he used in Fayette County. He finished his presentation by describing a simple fuel pump and hose device he used to clean out his bulk fuel tanks by removing bad fuel and water off of the tank bottom. The last presenter that discussed low cost solutions and innovations was Wade Weiss, County Engineer of Greene County. The innovations described by Wade included squeegee blades on plows, improved light emitting diode plow light installation, and the fabrication and use of concrete saw and dust control trailers.

IDENTIFICATION/PRIORITIZATION OF RESEARCH AND OUTREACH TOPICS

Just before lunch the attendees of the 2014 CERFG meeting identified and prioritized 21 research and outreach ideas for the Iowa HRB. These ideas are listed below in the order they were prioritized. The number of votes received by each subject is also shown. The six subjects that received the most votes were provided to the Iowa HRB for consideration.

1. Dyed Fuel Use on Roadways (30)
2. Manual on Proper Removal of Traffic Control Devices (23)
3. Feasibility of Gravel Road Recycling (19)
4. Innovative Frost Boil Treatments (15)
5. Soil Screw Abutment Use (Helical Pile Pier and Abutments Use) (14)
6. Equipment Replacement Optimization & Lease/Own Comparison (14)
7. Native Vegetation Blanket for Stabilization (13)
8. Investigating Steel Wheel Impacts on Various Surfaces (12)
9. Investigation of Increasing Moving Permit Fees based on Damage Estimates (11)
10. Development of Affordable Gravel Road Maintenance Condition Rating/Metrics Methodology (9)
11. Safety Impacts of Roadside Trees and Brush (8)
12. Economics of Epoxy Bridge Surface Treatments (7)
13. Synthesis - Agricultural Implements ESAL Equivalants Technical Transfer Document (6)
14. Effectiveness and Comparison of Pre-Wetting Treatment Impacts (6)
15. Sealing Evaluation of Timber Decks on Paved Routes (5)
16. Best Practices for Stream Bank Stabilization (4)
17. Update of Low Water Crossing Design/Signing on Gravel Roadways Manual (4)
18. Use of Bamboo in Glue-Laminated Timber Bridge Beams (3)
19. Synthesis - Environmental Impacts of Chemical Treatments for Soil Stabilization (3)

20. New Approach to Soil Nailing Abutment Repairs (could possibly be combined with the fifth idea listed) (1)
21. Impacts of Social Media on Agency Operations (1)

Problem statements for the six subjects that received the most votes were developed after the meeting and presented to the Iowa HRB. These subjects were included in the prioritization process used by the Iowa HRB for potential funding.

COUNTY ENGINEER “ROUNDTABLE” DISCUSSIONS

During lunch a series of roundtable discussions were conducted on several subjects. These discussions had a free-form style. First, a potential problem or issue was introduced and if time allowed, and there was an interest, it was discussed. Useful information about the subjects was offered by the attendees with additional insight. The following list includes the subjects suggested by county engineers before the meeting for potential discussion. Not all the subjects were discussed.

- Snow and ice removal policies
 - Does your County use the ISAC model policy?
 - Do you follow policy as written?
 - Do you have difficulty following policy with conflicting input from local law enforcement/supervisors/general public?
- Local effort calculations for budgeting
 - What percentage of your potential local revenue do you typically ask for - 100 percent, 95 percent, or minimum required 75 percent?
 - Does your Board accept your asking percentage, or is it negotiated each year?
- Does anyone have any ideas on innovative solutions to end cycles of Farm to Market restrictions?
- Are any counties using any products or methods that replace chip seals/seal coats? Is anyone using anything like chlorides, soy based products, and the use of cement/fly ash? How do they work on a wearing course? Also, is there a method that anyone has found to be cost effective? What application rates would be used?
- Would there be any interest in putting together a statewide AutoCAD/Civil3D standard for counties and cities?
- Let's have a discussion on bridge construction with county crews; bridge repair methods; coping with rock road aggregate loss; and channel degradation.
- What methods are counties using to keep the county roads open due to bridge or stream crossing situations?

RESEARCH IMPLEMENTATION LIST AND PRIORITIZATION DISCUSSION

A brief discussion was held during the 2014 CERFG about the prioritization of potential implementation for completed research projects. Four completed research projects were described and discussed and the attendees were asked to prioritize them for potential

implementation. A handout, with an abstract for each project, was also provided to the attendees. The four projects that were described and discussed were

- TR-568: Modified Sheet Pile Abutments for Low-Volume Road Bridges
- TR-579: Evaluation of Low-Cost Treatments on Rural Two-Lane Curves
- TR-540: Strategies to Address Nighttime Crashes at Rural Unsignalized Intersections
- TR-621: Geosynthetic Reinforced Soil for Low-Volume Bridge Abutments

The discussion of the four projects above focused on the importance of the subject considered. In addition, several examples of potential implementation were discussed. These examples included everything from a technical brief summary for distribution to the county engineers to a workshop or webinar training session. The group or agency (e.g., Iowa DOT or Iowa LTAP) funding the implementation would determine the most appropriate effort. A hand vote was completed and it was decided that some type of implementation effort should be completed for the TR-568 project and TR-621. It was determined that these efforts could be completed individually or in combination. Keith Knapp, Iowa LTAP Director, indicated that one of the major initiatives for the Iowa LTAP in 2014 was to complete some implementation activities for one or more projects. The funding for the implementation activities will depend on significance of the effort.

IMPLEMENTED RESEARCH TEAM PRESENTATIONS

The 2014 CERFG meeting concluded with presentations by two teams. Each team consisted of a researcher and staff member from a county secondary roads department. The objective of these presentations was to discuss a completed research project and its results along with any issues or factors related to the implementation of its results. The implementation discussed as part of the presentations was completed either during or after the research projects. The first presentation was done by Dr. James (Jim) Cable, private consultant, and Lyle Brehm, County Engineer of Tama County. The focus of their presentation was a research project that considered fabric interlayers and similar improvements. Jim discussed the concrete overlay research project and its initiatives and approach. Some of the subjects described were the use of geotextile interlayers and stringless paving. Lyle described some of the implementation issues of fabric interlayers and answered questions from the meeting attendees. The second presentation was completed by Pavana Vennapusa of the Institute for Transportation and Angela Kersten, Assistant County Engineer from Scott County. The focus of their presentation was geosynthetic reinforced soils at low volume bridge abutments. Pavana presented the details of his research project and Angela provided similar detail related to the implementation of geosynthetic reinforced soils. She also provided some example costs related to geosynthetic reinforced soil improvements used at bridge abutments in Scott County.

SUMMARY OF MEETING

The 4th annual CERFG meeting included presentations about ongoing and future research projects, discussions about common county agency issues, and low-cost innovations. There was also a discussion about research implementation and two presentations by researcher/county secondary road department staff teams about past research results that have been implemented. Roundtable discussions about some of the challenges faced by county engineers were also held.

Of course, the 2014 CERFG meeting also included a discussion and prioritization of potential research and outreach project ideas. The feedback at the 2014 CEFRG meeting was relatively positive, but improvements will continue to be made for 2015 or 2016.