

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): Iowa DOT

INSTRUCTIONS:

Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.

Transportation Pooled Fund Program Project # TPF-5(295)	Transportation Pooled Fund Program - Report Period: <input checked="" type="checkbox"/> Quarter 1 (January 1 – March 31, 2015) Quarter 2 (April 1 – June 30) Quarter 3 (July 1 – September 30) Quarter 4 (October 1 – December 31)	
Project Title: Midwest Smart Work Zone Deployment Initiative		
Name of Project Manager(s): Dan Sprengeler	Phone Number: 515-239-1823	E-Mail Dan.Sprengeler@dot.iowa.gov
Lead Agency Project ID: Keith Knapp	Other Project ID (i.e., contract #): Addendum 189	Project Start Date: July 1, 2014
Original Project End Date: June 30, 2020	Current Project End Date: June 30, 2019	Number of Extensions: None

Project schedule status:

On schedule
 On revised schedule
 Ahead of schedule
 Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Percentage of Work Completed to Date
\$455,000 (committed)	\$44,762.20	0

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
\$44,762.20		0

Project Description:

The Midwest Smart Work Zone Deployment Initiative (MwSWZDI) was initiated in 1999 as a Federal Highway Administration (FHWA) Pooled Fund Study intended to coordinate and promote research among the participating states related to safety and mobility in highway work zones.

The program is an ongoing cooperative effort between State Departments of Transportation, universities, and industry. The studies completed have consisted of evaluations of various work zone related products, various innovative topics, and several synthesis studies. Completed reports and descriptions of ongoing projects can be obtained at the Iowa State University's Institute for Transportation (InTrans) website (www.intrans.iastate.edu/smartwz/) link to the Smart Work Zone Deployment Initiative. InTrans currently operates as the program manager of the pooled fund efforts and completes administrative tasks related to request for ideas and proposals, meetings, project files, quarterly reports, and recommending reimbursement.

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):**Quarter Ending March 31, 2015 (Overall)**

During this quarter we communicated with a number of principal investigators. Resolved some progress issues. Posted some final reports, continued with all four program Year 2014 project contracts, and resolved the contracts for three of the four Year 2015 contracts. The progress on four Year 2014 projects are summarized below. The progress on two of the four Year 2015 projects that were very recently started are also summarized. The other two Year 2015 projects will start next quarter and are identified below. The projects being completed for this pooled fund under account number TPF-5(081) are summarized in another quarterly report.

Administratively, we communicated with Board about the proposals received for Year 2015 and resolved the contracts for three of the four projects selected. Plans were also made for an April 2015 work zone research focus group and Board meeting in St. Joseph, MO. The Board had agreed that the 2014 administrative contract should be extended and additional funds were added for a face-to-face Board meeting in Spring 2015. This action with the administrative contract taken this quarter. The Board also reviewed and agreed to the content of the 2015 administrative contract and this was finalized. The focus group meeting in St. Joseph, MO is being co-sponsored by the regional university transportation center at Iowa State University.

The following is a summary of accomplishments from January to March, 2015 for the Year 2014 and 2015 individual research projects under fund account TPF-5(295).

2015 Program Projects

- Evaluation of Alternative Work Zone Signing, University of Wisconsin – Madison, Madhav Chitturi as PI.

This project will be under contract in April 2015. It will start June 1, 2015 and is expected to end August 31, 2016.

- Developing a Data Driven Traffic Impact Assessment Tool for Work Zones, University of Missouri-Columbia, Praveen Edara as PI.

This project is under contract but does not start until June 1, 2015. It is expected to end on December 31, 2016.

- Orange Work Zone Pavement Marking Midwest Field Test, University of Wisconsin – Madison, Madhav Chitturi as PI.

This project started March 13, 2015, however, no work has been completed. A technical advisory committee has been developed and a kick-off meeting will be held shortly. The project is expected to end September 30, 2016.

- Setting Work Zone Speed Limits, Iowa State University, Anuj Sharma as PI.

The literature review on existing research and department of transportation policies on setting the work zone speed limits has been started. A technical advisory committee was developed and a meeting was held. The meeting was to get TAC input on project scope and discuss the data collection sites. Based on the TAC inputs it was decided to choose the data collection sites from the 2014 and 2015 Traffic Critical Projects in Iowa. A list of these projects was created and collection of detailed information about the projects is under way. The reason to focus on 2014 and 2015 Traffic Critical Projects was made to ensure the high quality of data regarding speed, crash, and work zone activities collected for the project. This project started March 15, 2015 and is approximately 5% complete. It is expected to end on May 31, 2016.

2014 Program Projects

- Work Zones in Innovative Geometric Designs Locations, University of Missouri, Henry Brown as PI.

A survey to obtain information regarding best practices of state DOTs and other agencies for implementing maintenance of traffic on projects with innovative geometric designs was developed and coded into Survey Monkey. The survey was sent to the TAC for review, and feedback on the survey was received from the TAC. After TAC approval, the survey was distributed to the DOTs from all 50 states and the District of Columbia. The survey was also distributed to a few local agencies and consultants as well as the listserv for the TRB Roundabouts Committee. To date, 48 responses to the survey have been received from 28 states. Respondents who indicated in the survey that they were willing to share maintenance of traffic plan samples were contacted. To date, 29 plan samples have been received from the following states: Indiana, Kentucky, Missouri, Minnesota, Ohio, and Pennsylvania. These plans have been reviewed to gain insight into the different methods that have been used for maintenance of traffic on projects with innovative geometric designs. Respondents who indicated in the survey that they were willing to discuss their experiences in a phone interview were contacted to determine their availability. Additional contacts for phone interviews were obtained from Jeff Shaw at FHWA and other sources such as the Arizona DOT and audience members from a presentation on the project to the St. Louis ITE Chapter. To date, 16 phone or in-person interviews have been conducted with personnel from DOTs, local agencies, and consultants from the following states: Georgia, Indiana, Kentucky, Maryland, Minnesota, Missouri, Ohio, Pennsylvania, and Utah.

Draft Typical Application Sheets for the initial construction of roundabouts, SPUIs, DDIs, RCUTs, MUTs, and DLTs have been developed. Draft Typical Application Sheets for maintenance of these facility types are currently in the process of being developed. Case studies for the final report are in the process of being identified. Draft sections for the draft final report been developed for the literature review, methodology, and results. The project is currently 65 percent complete and has an end date of June 30, 2015.

- Safety Assessment Tool for Construction Work Zone Phasing Plans, University of Missouri, Henry Brown as PI.

A survey to obtain information regarding best practices of state DOTs and other agencies for incorporating safety analysis into the process of evaluating construction phasing alternatives was developed and coded into Survey Monkey.

The survey was reviewed and approved by the TAC and sent to the DOTs for all 50 states as well as the District of Columbia. To date, 22 survey responses have been received. A separate survey for contractors was also developed and coded into Survey Monkey. After TAC review and approval, the survey was sent to 70 contractors in Missouri, Nebraska, and Wisconsin. Additional contacts for potential respondents for the contractor survey are being sought through SWZDI and other sources such as American General Contractors (AGC) of Missouri. To date, 5 survey responses have been received.

In order to supplement the Missouri work zone and crash data, a list of types of data regarding work zones and crashes needed for the project was developed, and a request for work zone and crash data was sent to 20 states, including all of the SWZDI states. Several states responded that they did not have the data being requested, especially since linking crash data with work zone data is very challenging. Three states indicated that they potentially have data that could be beneficial for this project: Kansas, Wisconsin, and Ohio. Coordination with these states regarding these data is in progress.

Investigation into different modeling approaches such as before-after study and making a Safety Performance Function (SPF) has begun. A preliminary SPF for Missouri freeway work zone crashes is currently being developed. A preliminary evaluation of work zone data from 2009 to 2014 has been performed to look at general trends regarding the number of crashes that have occurred in these work zones and characteristics such as AADT, work zone length, and work zone duration. The project currently 40 percent complete and has an end date of December 31, 2015.

- Length of Need for Free-Standing, F-Shape, Portable 12.5' Concrete Protection Barrier, University of Nebraska, Ron Faller as PI

During this quarter, MwRSF completed simulation of impacts on the upstream and downstream ends of the 200 ft long barrier system to determine the length of need. Simulations were conducted at seven impact points on the upstream end of the barrier system and eight impact points on the downstream end of the barrier system. These simulations are currently being reviewed to determine where the length of need starts and ends for the long system. At this time the models of the upstream end of the system have been evaluated and documented. Additional models may be simulated with intermediate impact points to further refine the results. Once all of the results are fully analyzed, the results will be used to determine the beginning and end of length of need based on several factors, including barrier displacement, pocketing, occupant risk measures, and vehicle trajectory and stability.

The results of the friction testing of the F-shape PCB on asphalt were analyzed this quarter. The results of that analysis found that the dynamic friction coefficient between the concrete barriers and asphalt pavement was 0.51. Previous testing of the concrete barrier on concrete pavement yielded a friction value between 0.40 and 0.44. The concrete on concrete values are being used in the current simulation models. The results of the friction testing on asphalt indicated that barrier friction on asphalt surfaces is potentially higher than on concrete. Thus, analysis performed with the concrete-to-concrete friction values should provide conservative estimates for barrier restraint and deflection. This project is 30 percent complete and has an end date of December 31, 2015.

- Development of a TL-3 Transition between Temporary Concrete Barrier and Guardrail, University of Nebraska, Ron Faller as PI

During this quarter, MwRSF submitted the final CAD details for the first full-scale test of the guardrail to PCB transition system to the field crew at the MwRSF Outdoor Test Facility for placement into the testing queue. The first full-scale test will be MASH test designation no. 3-21, which will evaluate the transition from the guardrail to the PCB system by impacting upstream of the connection between the two systems. The test matrix is listed below.

1. Test no. 3-21 - Impact of the 2270P vehicle on the centerline of the fifth guardrail post upstream from the end-shoe attachment at a speed of 62 mph and an angle of 25 degrees.
2. Test no. 3-21R - Reverse direction impact of the 2270P vehicle 12 ft – 6 in. upstream from the end-shoe

attachment at a speed of 62 mph and an angle of 25 degrees.

3. Test no. 3-20 - Impact of the 1100C vehicle on the critical impact point of the guardrail to PCB transition at a speed of 62 mph and an angle of 25 degrees. MASH procedures and engineering analysis will be used to determine the critical impact point.

If possible, the first full-scale test of the guardrail to PCB transition will be conducted in the upcoming quarter. The actual date for the full-scale crash testing will be determined once the test facility personnel have reviewed the details and ordered materials. The testing of the guardrail to PCB transition will be conducted as soon as resources are available. However, completion of the testing is dependent on the schedule of existing crash testing commitments and may not occur if projects with higher priority in the testing queue prevent the test from being completed. This project is 12 percent complete and has an end date of December 31, 2015.

Anticipated work next quarter:

Work will continue on contracted projects. Several contracted projects, funded by the old pooled fund account (see the other quarterly report) were finalized this quarter. The last project will be finalized in April 2015. We will continue to work with the principal investigators of the Program Year 2014 project and the new principal investigators for Program Year 2015. In the next quarter the last Program Year 2015 project contract will be finalized and all Program Year 2014 and 2015 projects will continue. A work zone focus group and face-to-face board meeting will also be held to explore research ideas and the future actions of the pooled fund.

Significant Results:

All four Program Year 2014 projects continued and three of four Program Year 2015 contracts were finalized. Progress on two Program Year 2015 projects occurred.

Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints set forth in the agreement, along with recommended solutions to those problems).

Currently there are no problems to report with the administrative contract. Any issues that have come up with the individual projects that may impact schedule or budget are resolved on a case by case basis.

Potential Implementation:

None at this time. Projects funded under this account number for Program Year 2014 began about 9 months ago and two Program Year 2015 projects just recently started. The other two selected for Program Year 2015 have not yet started.