

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: Quarter 1 (January 1 – March 31, 2014) Quarter 2 (April 1 – June 30) Quarter 3 (July 1 – September 30) X 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
\$500,000 (committed)	\$3,197.88	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
\$3,197.88		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 December 31, 2014 (Overall)**

During this quarter we communicated with various principal investigators. Resolved some progress issues. Posted some final reports and continued with all four program year 2014 project contracts. The progress on these four projects are summarized below. Those 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 the next program year. These proposals were ranked and weighted in a two round process. A meeting of the Board was held on December 22, 2014 and four projects were selected for funding. The Board also agreed that the 2014 administrative contract should be extended and additional funds added for a potential face-to-face meeting in Spring 2015. They also reviewed and agreed to the content of the 2015 administrative contract as discussed at the meeting. Negotiations to complete the contracts for these projects area ongoing. The projects selected for funding for program year 2015 included:

- Evaluation of Alternative Work Zone Signing (Chitturi, University of Wisconsin – Madison and Edara, University of Missouri-Columbia)
- Developing a Data Driven Traffic Impact Assessment Tool for Work Zones (Edara, University of Missouri-Columbia)
- Orange Work Zone Pavement Marking Midwest Field Test (Chitturi, University of Wisconsin – Madison)
- Setting Work Zone Speed Limits (Sharma, Iowa State University)

The following is a summary of accomplishments during the first quarter of the four individual research projects under fund account TPF-5(295).

2014 Program Projects

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

A review of the existing literature regarding phasing for construction and maintenance of facilities with innovative geometric designs was completed. 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. The list of contacts for the survey is in the process of being finalized. Work has begun on the development of

template drawings for the Typical Application sheets that will be developed as part of this project. The project is currently 35 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 review of the existing literature regarding the effects of work zones on safety and states' practices for evaluating work zone safety was completed. 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 list of contacts for the survey is in the process of being finalized. A survey of contractors is also in the process of being developed. 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. Here is a list of states contacted: Florida, Idaho, Illinois, Maine, Michigan, New Hampshire, North Carolina, Ohio, Pennsylvania, South Carolina, South Dakota, Tennessee, Virginia, West Virginia, Wyoming, Indiana, Minnesota, Nebraska, Iowa, and Kansas. Kansas is in the process of gathering data for the project. Investigation into different modeling approaches such as before-after study and making a Safety Performance Function (SPF) has begun. The project currently 30 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 development and validation of the baseline PCB model for use in the study. The LS-DYNA simulation model of the PCB system was 200 ft long and was compared to full-scale crash tests to build confidence in the simulation model. As part of the baseline model development, three different versions of the Chevy Silverado model were simulated with the F-shape PCB system, and variations in tire stiffness, wheel disengagement, vehicle steering, and friction values were evaluated. All of the models were evaluated using the RSVVP comparisons outlined in NCHRP 179. Through the analysis of these model variations, a baseline model was developed that closely matched the full-scale test results in terms of vehicle and barrier behavior. Dynamic system deflections were within 2% of the full-scale test and the simulation met the RSVVP criteria. Thus, the baseline model was judged appropriate for the simulation of impacts on the upstream and downstream ends of the system and reduced system lengths. The next phase of the research effort was to simulate impacts on the upstream and downstream ends of the 200 ft long barrier system to determine the length of need. Simulations have been 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. Additional models may be simulated with intermediate impact points to further refine the results. Friction testing of the F-shape PCB on asphalt was also conducted this quarter. However, the results have not been processed at this time. A TAC meeting was held on November 24, 2014 to update the committee on the current progress. This project is 15 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 developed CAD details for the first full-scale test of the guardrail to PCB transition system. Recall that work in the previous quarter led to development of various attachment options between the PCB's and the guardrail. NDOR TAC representatives reviewed these options and agreed to use the proposed guardrail to PCB attachment and the folded plate blockout attachment for testing and evaluation. 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 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, and 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. A TAC meeting was held on November 24, 2014 and the project status was reviewed satisfactorily. This project is 10 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 the old pooled fund account (see the other quarterly report) were completed in 2014. Several more will be finalized in the first quarter of 2015. We will continue to work with the principal investigators of the Program Year 2014 projects and the new principal investigators for Program Year 2015. This next quarter the Program Year 2015 contracts will be finalized, a face to face board meeting may be held to explore research ideas and the future actions of the pooled fund, and as noted above several projects will be completed.

Significant Results:

All four Program Year 2014 projects continued and projects for Program Year 2015 were selected.

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 began about 6 months ago and the others have not yet begun.