**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(219)* | **Transportation Pooled Fund Program - Report Period:** Quarter 1 (January 1 – March 31, 2014) X Quarter 2 (April 1 – June 30, 2014)  Quarter 3 (July 1 – September 30, 2014) Quarter 4 (October 4 – December 31, 2014) |
| **Project Title:** Development of a Structural Health Monitoring System to Evaluate Structural Capacity and Estimate Remaining Service Life for Bridges |
| **Project Manager: Phone: E-mail:**Ahmad Abu-Hawash 515-239-1393 ahmad.abu-hawash@dot.iowa.gov |
| **Project Investigator: Phone: E-mail:**Brent Phares 515-294-5879 bphares@iastate.edu |
| **Lead Agency Project ID:**RT 329 | **Other Project ID (i.e., contract #):**Addendum 367 | **Project Start Date:** 3/01/10 |
| **Original Project End Date:** 2/28/15 | **Current Project End Date: 6/30/17** | **Number of Extensions:** |

Project schedule status:

X On schedule □ On revised schedule □ Ahead of schedule □ Behind schedule

Overall Project Statistics:

|  |  |  |
| --- | --- | --- |
|  **Total Project Budget** |  **Total Cost to Date for Project** |  **Total Percentage of Work** **Completed** |
| $869,911.00 | $340,891.61 | 49% |
|  |  |  |
|  |  |  |

***Quarterly*** Project Statistics:

|  |  |  |
| --- | --- | --- |
|  **Total Project Expenses** **This Quarter** |  **Total Amount of Funds**  **Expended This Quarter** | **Percentage of Work Completed** **This Quarter** |
| $18,091.13 |  | 2% |

**Project Description:**

* Literature Review: Damage detection and load rating algorithms
* Literature Review: Techniques for assessing remaining service life
* Interim Report
* Development of real-time, strain-based algorithm(s)
* Development of real-time, vibration-based algorithm(s)
* Development of real-time, fused-data algorithm(s)
* Compare and contrast result(s) from Tasks 4 through 6
* Interim Report
* Development of Statistical Models to Extrapolate Time-dependent Load Ratings
* Development of Structural Models to Quantify Extrapolations
* Final Report

**Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):**

The most recent TAC meeting was held on July 1 (rescheduled from June 24 due to multiple conflicts). During that meeting we described the progress made. Of principal note is the fact that we have conclusively been able to determine that cyclic behavior observed is, in fact, true changes in bridge behavior. This has signficiant implications on the load rating and damage detection algorithms as we needed to modify them to account for differences in behavior at different times of the year. With regard to the capacity estimation algorithm, we have finalized the development of a monte carlo based algorithm that estimates ultimate capacity from service level stiffness measurements.

**Anticipated work next quarter:**

In the next quarter we hope to install additional monitoring systems on bridges in Illinois and/or Wisconsin. We have been working with appropriate folks in each state to coordinate these installations. Our damage detection algorithm software will be revised to include a temperature-based evaluation for changes in behavior. Specific questions with regard to the load rating algorithm (e.g., number of events, number of runs, influence of temperature, etc.) will continue to be evaluated.

**Significant Results:**

**Circumstance affecting project or budget (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).**

None.