# 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 # <br> *TPF-5(219)* | Transportation Pooled Fund Program - Report Period: <br>    Quarter 1 (January 1 – March 31, 2017) <br>    Quarter 2 (April 1 – June 30, 2017) <br>    **X** Quarter 3 (July 1 – September 30, 2017) <br>    Quarter 4 (October 1 – December 31, 2017) |
|---|---|
| **Project Title:** Development of a Structural Health Monitoring System to Evaluate Structural Capacity and Estimate Remaining Service Life for Bridges || 

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|---|---|---|
| **Project Manager:** <br> Ahmad Abu-Hawash | **Phone:** <br> 515-239-1393 | **E-mail:** <br> ahmad.abu-hawash@dot.iowa.gov |
| **Project Investigator:** <br> Brent Phares | **Phone:** <br> 515-294-5879 | **E-mail:** <br> bphares@iastate.edu |
| **Lead Agency Project ID:** <br> RT 329 | **Other Project ID (i.e., contract #):** <br> Addendum 367    12095 | **Project Start Date:** <br> 3/01/10 |
| **Original Project End Date:** <br> 2/28/15 | **Current Project End Date:** 6/30/18 | **Number of Extensions:** |

Project schedule status:

☐ On schedule     **X** 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 | $657,442.40 | 79% |
| | | |
| | | |

*Quarterly* Project Statistics:

| Total Project Expenses <br> This Quarter | Total Amount of Funds <br> Expended This Quarter | Percentage of Work Completed <br> This Quarter |
|---|---|---|
| $16,339.97 | | 8% |

**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.):**

TAC meeting was held on 9/26/2017 to report the progress of the project.
In this quarter, efforts have continued on both the deterioration modelling as well as capacity estimation.  During the TAC meeting, the capacity estimation was a topic of much discussion and as a result we have added one additional laboratory specimen.

**Anticipated work next quarter:**

We will be continue working on our remaining life models, improving the SHM facilitated condition based bridge management prototype, and documenting the methodology, assumptions, and results of the life cycle analysis and remaining life estimation. Additionally, we plan to plan for another round of ultimate capacity tests which will be used in the load rating part of the algorithms.

**Significant Results:**
A life cycle cost analysis was done and documented to justify the cost of SHM instrumentation

**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.