# 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(445)* | **Transportation Pooled Fund Program - Report Period:**<br>Quarter 1 (January 1 – March 31)<br>XQuarter 2 (April 1 – June 30)<br>Quarter 3 (July 1 – September 30)<br>Quarter 4 (October 1 – December 31) |
|---|---|

| **Project Title:**<br>**Design Guidelines and Mitigation Strategies for Reducing Sedimentation of Multi-barrel Culverts** | | |
|---|---|---|
| **Name of Project Manager(s):**<br>**Marian Muste** | **Phone Number:**<br>**319-384-0624** | **E-Mail**<br>marian-muste@uiowa.edu |
| **Lead Agency Project ID:** | **Other Project ID (i.e., contract #):** | **Project Start Date:**<br>**February 1, 2020** |
| **Original Project End Date:**<br>**January 31, 2023** | **Current Project End Date:**<br>**January 31, 2023** | **Number of Extensions:** |

Project schedule status:

☐ On schedule X☐ On revised schedule ☐ Ahead of schedule X Behind schedule (see comments)

Overall Project Statistics:

| Total Project Budget | Total Cost to Date for Project | Percentage of Work Completed to Date |
|---|---|---|
| $300,000 | $118,324.52 | 85% |

***Quarterly*** Project Statistics:

| Total Project Expenses and Percentage This Quarter | Total Amount of Funds Expended This Quarter | Total Percentage of Time Used to Date |
|---|---|---|
| | $ 10,770 | % |

**Project Description**:

The overall goal of the TPF-5(445) project is to leverage the extensive research conducted in Iowa though a multi-state research effort leading to design guidelines and specifications for mitigation measures for reducing sedimentation at existing and proposed multi-barrel culvert locations. The guiding principles and best practices for mitigating sedimentation will complement the existing hydraulic design guidelines. The project entails laboratory, numerical, and field monitoring and analysis to determine the overall effect of the sedimentation-reduction designs on the hydrology and transport of sediment at culverts. The project outcomes will be assembled in a web-based platform with interactive parameters that can uniquely support the routine activities related to culverts.

The TPF-5(445) project objectives are:

1. Assemblage of data and knowledge on sedimentation at culverts and mitigation measures
2. Synthesis of the practical knowledge in guidelines for design and operations for reducing or eliminating sedimentation at culverts
3. Development of a web-based platform that will embed the formulated guidelines in easy to use interactive interfaces that will facilitate to retrieve design and operation information and to guide in the selection of a self-cleaning culvert design fit for the local flow and sediment transport conditions.

**Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):**
For the reference period (March 31-June 30, 2022), the research was focused on the following tasks:

- Following the first in-person meeting of the project TAC, held in Iowa City, December 1-2, 2021, the initial scope of the project was changed to include:
    - modifications to the culvert model's current configuration to better match the culvert design specifications and sediment transport conditions occurring in New Mexico and Utah environments.
    - Introduction of a methodology quantification of the amount of sediment accumulated in the sediment deposits after the execution of the experimental runs using an accurate instrumentation. IIHR-Hydroscience & Engineering possesses the equipment required for this purpose (a lidar-based scanning system) that can be used by paying an internally-established recovery rate.

Consequently, the initial Tasks #3 and 4 of the initial project plan have been considerably modified.
The modifications entail a change in the number of tests to be conducted and changes of the modeling protocols to a higher degree of complexity. Given that the above-mentioned modifications bring along additional costs for changing the model and executing the modeling, a new survey (#6) was created to evaluate what can be done with the initial funds and how much funding is needed to accomplish the newly proposed activities. The survey has been now completed and used for guiding our future research.

At this time, we finalized all the construction of the New Mexico-Utah culvert configuration and we are currently commissioning the model for the new set of tests chartered by Survey #6.

**Anticipated work next quarter**:

- Tests on new culvert configuration (typical for New Mexico and Utah), setting of new measurement protocols, and execution of the tests in the light of the meeting discussions.

**Significant Results:**

A TPF project progress meeting was held virtually on June 10, 2022 followed by the assemblage of the Survey #6 inputs from the state partners. No new results are to be reported at this time as most of the activity involved the construction of the new model configuration.

**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).**

- The COVID-19 pandemic adversely affected the project developments in multiple ways. Another COVID crises occurred in June 2022 holding the shop with the change in the model configurations. Despite the unforeseen circumstances created by the COVID-19 pandemic, we expect to deliver the tasks specified by TAC.

- We hope that by garnering additional funding provided by Missouri DOT and by intensifying the modeling efforts, we will be able to recover the time lost due to COVID pandemic and additional modeling tasks, therefore we do not ask for any change in the project scheduling at this time.

**Potential Implementation:**