

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): FHWA

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.

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| Transportation Pooled Fund Program Project # TPF-5(248) | Transportation Pooled Fund Program - Report Period: <input checked="" type="checkbox"/> Quarter 1 (January 1 – March 31) 2013 <input type="checkbox"/> Quarter 2 (April 1 – June 30) 2013 <input type="checkbox"/> Quarter 3 (July 1 – September 30) 2013 <input type="checkbox"/> Quarter 4 (October 1 – December 31) 2013 | |
| Project Title: <i>Enhancements to the FHWA-FST2DH Model for Simulating Two-dimensional Depth-averaged Flow and Sediment Transport</i> | | |
| Name of Project Manager(s): Kornel Kerenyi | Phone Number: (202) 493-3142 | E-Mail kornel.kerenyi@fhwa.dot.gov |
| Lead Agency Project ID: | Other Project ID (i.e., contract #): | Project Start Date: |
| Original Project End Date: | Current Project End Date: | Number of Extensions: |

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 |
|----------------------|--------------------------------|--------------------------------------|
| | | |

Quarterly Project Statistics:

| Total Project Expenses and Percentage This Quarter | Total Amount of Funds Expended This Quarter | Total Percentage of Time Used to Date |
|----------------------------------------------------|---------------------------------------------|---------------------------------------|
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Project Description:

FST2DH is FHWA's Two – Dimensional Hydraulic Model for modeling flows in floodplains and through complex bridge openings. The model was developed more than ten years ago and since that time many improvements have been made in computational capability. The program needs to be modified to take full advantage of these capabilities. Additionally, much advancement has been made to the computer hardware that is needed to solve the complex series of equations used by the program. Numeric algorithms for solving simultaneous series of equations have continued to evolve and computers with multiple cores that can speed up the solution times by a factor of ten are now the norm. From an engineering perspective, we are more frequently being asked to solve complex problems involving multiple bridge openings, different types of structures, multiple embankments that alter natural flow patterns, unsteady flows, sediment transport, and scour countermeasure design. Because of the increasingly more difficult types of problems that are routinely being encountered, the state-of-practice needs to continue to improve to keep pace.

The current version FST2DH is not suitable for modern computer standards and has to be improved. FST2DH is used by many state DOT's to perform hydraulic modeling for bridge scour calculations. The objective of the study is to update the FHWA-FST2DH model for simulating two-dimensional depth-averaged flow and sediment transport.

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

The investigation continued on the potential installation and execution of non-parallel version of FST2DH on supercomputer. The purpose was to explore the functionality and potential future implementation of parallel version.

Anticipated work next quarter:

Significant Results:

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).

Potential Implementation: