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.

Transportation Pooled Fund Program Project #	**Transportation Pooled Fund Program - Report Period:**
TPF-5(131)	√Quarter 1 (January 1 – March 31) 2012 ☐Quarter 2 (April 1 – June 30) 2012 ☐Quarter 3 (July 1 – September 30) 2012 ☐Quarter 4 (October 1 – December 31) 2012

Project Title: *Underwater Inspection of Bridge Substructures Using Underwater Imaging Technology*		
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**

Project Description:

The contractor works with federal personnel from the Hazard Mitigation team at the Turner Fairbank Highway Research Center (TFHRC) to research the application of acoustic imaging technology to satisfy the inspection requirements of Federal Highway Administration (FHWA) 23CFR650 and the Bridge Inspection Reference Manual (BIRM) for Level I Underwater Inspections. This project has the potential to improve methods to assess the underwater condition of existing transportation structures and increase the safety of the nation's bridges. In addition, the proposed technology has the potential to reduce exposure of staff to hazards encountered while performing underwater inspections.
The following underwater applications are recognized to have significant potential benefits to the current practice in bridge inspection of underwater components:

- Rapid condition assessment (i.e. post seismic events and boat impacts)
- Active and passive scour evaluation
- Construction inspection
- Security threat assessment
- Enhancing diver safety and efficiency
- Visual representation of the entire underwater structure

This research project will evaluate the feasibility of using underwater acoustic imaging technology to produce underwater inspection results that are equal or better than current practice for Level I underwater inspection requirements. The project will conduct an objective comparative evaluation of the inspection quality, cost, time and employee safety aspects of conducting the underwater inspection using in water divers versus acoustic imaging technology.

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

In this reporting period the Support Services contractor for the FHWA Hydraulics Laboratory worked with the sub contractors to conduct literature search in support for the preparation of field testing. A Literature Review Report was generated and distributed to the research group and TAC members for commenting. The subjects covered in the report include:

- Overview of underwater imaging
- Current underwater inspection practices
- Literature review methodology
- Basics of acoustic theory
- Types of sonar technology
- Past research studies
- Sonar applications and case studies
- Literature review information assessment
- Recommendations to field test criteria

A kickoff meeting was convened to introduce all research team members and representatives from sponsoring agencies. Desirable approaches are further defined in the meeting as:

- Not to be exhaustive in various types of technology.
- Tests should include difficult water conditions (swift, deep, black).
- Quantitatively measure and record time, cost, safety, and quality offered by acoustic imaging. Devise a fair comparison between current and new techniques.
- Divers and operators of acoustic imaging machines should not work too closely.
- Selected site can be a part of a bridge.
- Criteria for the evaluation should meet the regulation Level I diving.
- Identify potential additional resources or riding project.

Anticipated work next quarter:

The primary tasks in the next quarter include:

- TAC Coordination on Field Test Sites
- Manufacturer Coordination
- Finalizing Field Test Plan
- Equipment Procurement

Significant Results:

See Draft Literature Review Report

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).

None during this quarter.

Potential Implementation:

None during this quarter.