**TRANSPORTATION POOLED FUND PROGRAM**

**QUARTERLY PROGRESS REPORT**

Lead Agency (FHWA or State DOT):

Arizona Department of Transportation

**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(166)* | | **Transportation Pooled Fund Program - Report Period:**  🗹Quarter 1 (January 1 – March 31)  □Quarter 2 (April 1 – June 30)  □Quarter 3 (July 1 – September 30)  □Quarter 4 (October 1 – December 31) | |
| **Project Title:**  Application of three Dimensional Laser Scanning for the Identification, Evaluation, and Management of  Unstable Highways and Slopes | | | |
| **Name of Project Manager(s):**  **Christ G Dimitroplos** | **Phone Number:**  **(602)712-7850** | | **E-Mail**  cdimitroplos@azdot.gov |
| **Lead Agency Project ID:** | **Other Project ID (i.e., contract #):**  **JPA-08-019M** | | **Project Start Date:**  12/12/08 |
| **Original Project End Date:**  **12/12/10** | **Current Project End Date:**  **12/12/11** | | **Number of Extensions:**  1 |

Project schedule status:

□ On schedule □ On revised schedule □ Ahead of schedule 🗹Behind schedule

Overall Project Statistics:

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| **Total Project Budget** | **Total Cost to Date for Project** | **Percentage of Work**  **Completed to Date** |
| $210,000 | $130,000 | 75% |

***Quarterly*** Project Statistics:

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| **Total Project Expenses**  **and Percentage This Quarter** | **Total Amount of Funds**  **Expended This Quarter** | **Total Percentage of**  **Time Used to Date** |
| $2400 (1.8%) | 2400 | 92 |

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| **Project Description**:  The identification, evaluation, and categorization of high risk slopes (to include geological conditions and slope stability hazards) has always been a labor intensive task. LIght Deflection and Ranging (LIDAR) is a technology that is able to scan a 3D service and put them into data points. This results in rock mass and rockfall characterization. This project will take scans of several states and characterize several slope formations. Together with the software, this technology has the capability to perform the above tasks in a much improved yet simplified way. |

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| **Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):**  1. Dr. Kemeny continued to prepare the final report on the LIDAR pooled fund project. This report describes the results of field LIDAR studies conducted in each of the eight states that participated in the DOT pooled fund project, as well as outcomes from the end-of-project workshop that was held November 2-3, 2011 in Phoenix, Arizona. The final report will also include a chapter on best practices for LIDAR scanning and analysis, as well as recommendations for future work in the topics of field LIDAR scanning and point cloud processing for geotechnical applications.  2. A presentation was made on the results of the pooled fund project on February 27, 2012. The presentation was made to engineering students at the University of Arizona and the title of the talk was “Geotechnical Applications of Ground-Based LIDAR: Case Studies in Eight States”. |
| **Anticipated work next quarter**:  Review Draft final Report by the Technical Advisory Committee. |

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| **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).**  The PI requested additional time to submit the draft final report. A new submittal date of 15 May 2012 was  accepted. |

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| **Potential Implementation:**  LiDAR facilitates efficient remote three dimensional surveys of geometric surfaces in a safe and cost efficient, reliable and accurate manner, reducing exposure of personnel to hazardous working conditions, and creating a permanent record of on site conditions.  It has proven to be capable of streamlining geological and geotechnical rock mass characterization and is a significant aid in the analysis of rock cut slopes, tunnels, and retaining wall stabilities projects.  LiDAR scanners mounted on vehicles have the potential for efficient and labor reducing task of inventorying of rock fall hazards sites. By comparing data sets from one year to another discrete changes in cut slopes g geometries and loose rock can be detected that may not be obvious from manual observation. Similarly Terrestrial LiDAR may be used to efficiently determine excavation quanities of in place materials during and after construction, blasting techniques and thereby reducing the potential for claims and wandering construction limits. |