**TRANSPORTATION POOLED FUND PROGRAM**

**QUARTERLY PROGRESS REPORT**

Lead Agency (FHWA or State DOT): \_Minnesota Dept 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(134)* | | **Transportation Pooled Fund Program - Report Period:**  Quarter 1 (January 1 – March 31)  Quarter 2 (April 1 – June 30)  Quarter 3 (July 1 – September 30)  XQuarter 4 (October 1 – December 31) | |
| **Project Title:** Pavement Surface Characteristics Rehabilitation MnROAD Study. TPF 5-(134). | | | |
| **Name of Project Manager(s):**  Bernard Igbafen Izevbekhai, P.E., Ph.D. | **Phone Number: 651366 5454** | | **E-Mail:**  **Bernard.izevbekhai@state.mn.us** |
| **Lead Agency Project ID:** | **Other Project ID (i.e., contract #):** | | **Project Start Date:** |
| **Original Project End Date: June 2013** | **Current Project End Date: October 2014** | | **Number of Extensions: 1** |

Project schedule status:

x□ 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** |
| $315000  $275,000 for 5 years  +$40,000 for Rolling Resistance | $315000 | 100% |

***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** |
| ≈100% | $70000 RR analysis (Transtec)  $ 24000 DG Final report (MSU) | 100 % with extension |

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| **Project Description**:  **OBJECTIVES**: To demonstrate and field-validate some lab-tested unique diamond grinding configurations that optimize noise, Friction, Texture and Ride Quality  **PROJECT MANAGER**:  Bernard Izevbekhai PhD  **LEAD AGENCY**:  MnDOT  Data Collection : MnDOT  **PRINCIPAL INVESTIGATORs**:   1. **Data Collection** : MnDOT 2. **Data Analysis,**   W. James Wilde, PhD, P.E. MSU   1. **Rolling Resistance**   Jerzy Ejsmont DSc. Tech University of Gdansk, Poland  (3) **Statistical Pass By**  Tim Casey (HDR) Inc  (4) **ROBOTIC Texture evaluation**  **Multivariate Analysis of ROBOTEX & Surface Variables**  R.O. Rasmussen, PhD, P.E. Transtec Inc  R. Sohaney, P.E. (Transtec Inc)  **PROJECT EXPENDITURES TO DATE**:  Non-Federal Match.  In-Kind Cost of Grinding And Noise Testing On Cell 37 MnRoad. As A Proof Of Concept.  Full Width Grinding On Cells 7-8 MnRoad Mainline I-94  MnDOT Initial Testing, MnDOT Rodeo (June 2008)  Spring Noise Texture, Ride Friction Measurements  Consultant Appointed For Data Analysis And Reporting  Strategies For Additional Testing  Testing And Monitoring of Cell 9  Draft Brief on Cell 9  Construction Report 7 8 & 9.  **Spring OBSI testing**  **Spring Ride Quality testing**  **Publication of Task 1 (Jim Wilde)**  **Completion of Draft Report on SPPB Tests on I-94 and MnROAD Cells**  **Completion of HDR SPPB /MnDOT OBSI Final Report.**  **Development of Rolling Resistance Initiative**  **Assistance with Technology Deployment: MnDOT Metro, MnDOT District 1 Duluth Projects**  **Summer OBSI, Ride Texture and Friction measurement**  **Fall OBSI, Ride Texture and Friction Measurement**  **Test Strip #5 Ground on Cell 37. Innovative with Improved friction.**  **Contract extended to accommodate Rolling Resistance testing**  **Contract documents initiated for comprehensive Robotex texture evaluation of diamond ground cells at MnROAD**  **Draft Final Report of Rolling Resistance in the Press**  **Draft final Robotex Report submitted**  **Extension of texture studies for RR multivariate analysis** |

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| **Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):**  Final Report on Diamond grinding Study Posted  Final Report on Multivariate Analysis of RR and texture variables Posted  **WORK COMPLETED:**   * ACPA / IGGA performed the Grinding of 3 configurations at MnROAD Cell 37 for a proof –of –Concept and Preliminary On-Board -Sound –Intensity (OBSI) pre and post grind measurements on the 3 configurations + control. MnDOT performed Ride Friction, and Texture measurements on the same pre and post grind configurations. * Memorandum of Understanding with Diamond Surface Incorporated to perform the Diamond Grinding Full width on cell 7 and 8 MnROAD. * Measurements of Surface Characteristics parameters on the MnROAD Low volume Road * Actual grinding of the Mainline cells 7 and 8 to the current and Innovative grinding configurations. * Pre-grind Measurements for the MnROAD Mainline * Grinding of Cells 7 and 8 full Width by Diamond Surfaces Inc. * Initial Post Construction Ride texture friction Ride measurement by Mn/.DOT * Draft Construction (Grinding Report for cells 7 and 8 Innovative Grinding & Conventional configurations) * Development of Limited Scope of Consultant Activity for MnSCU Mankato * MnDOT Initial Testing, MnDOT Rodeo (June 2008) * Spring Testing Noise texture, Ride friction Measurements * Consultant (Minnesota State University, Mankato) Appointed for Data Analysis and Reporting. Principal Investigator is W. James Wilde, PhD. * MnROAD Cell 9 Ultimate Grinding Cell Created Ground and Tested. * Spring Testing (Texture ASTM E-965, E-2157, Friction GN & FN, IRI, OBSI) * Proposal to Conduct comprehensive evaluation (OBSI, CPB, SPB) on a Real Roadway. (Prescott WI or Monticello TH 94 MN) Estimated to Cost $62,000. ($20,000 Approved from by the Pooled Fund) Contract with HDR executed. * OBSI and SPB in Progress near Hasty MN. The 1000-ft section is ground and east of that section an unground portion is being evaluated. * Successful Web meeting on June 1 2009. Plans for a RODEO discussed but not yet done. * Analysis of Friction Ride and OBSI over time Presented by W.J. Wilde * Omnibus Cell 7 8 & 9 Report * MnDOT Transtec Rodeo on Cells 37 7,8, 9 and others. * OBSI and SPB in Progress near Hasty MN. The 1000-ft section is ground and east of that section an unground portion is being evaluated. Draft SPB Report Review. * Summer 2009 Measurements * Fall 2009 Measurements * **Statistical Pass By Testing Completed.** * **Draft report on Statistical Pass By Testing Completed.** * **Spring testing by MnDOT OBSI Ride and texture.** * **Final Statistical pass-by report Submitted for Publication** * **Test Strip #5 ground on cell 37.** * **Cell 71 ground innovative Driving and conventional passing** * **Subcontract for Rolling Resistance measurements** * **Rolling Resistance measurements on all MnROAD cells Performed in September** * **Robotex Measurements performed on all MnROAD Cells** * **Pooled fund meeting on 10/5/11** * **Final Report of Rolling Resistance Report Published** * **http://www.lrrb.org/media/reports/201207.pdf** * **Final Report Completion Date extended to Oct 2013** * Final Report on Diamond grinding Study Posted * Final Report on Multivariate Analysis of RR and texture variables Posted |
| **Anticipated work next quarter**:   * No Cost Extension Request to Rerun Rolling Resistance * Contract Documents with MSU/ Tech University of Gdansk Poland   Final Report: http://www.lrrb.org/media/reports/201429.pdf |

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| **Significant Results:**  **Report of Rolling Resistance Multivariate Analysis**  **Quietness of Innovative Diamond Grind** |
| **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).**  **To accomplish testing of Rolling resistance in 2014, Funds in the TPF were insufficient but MnDOT**  **added $27000 to make up the $75000 to facilitate this testing. This was the final activity in this Pooled**  **Fund Study.** |

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| **Potential Implementation:**  Already Quiet grind is being implemented:.   * MnDOT Duluth 50 million Dollar rehab project * MnDOT TH 52 Rehab Project * MnDOT Interstate 394 * Nationwide Acceptance and Usage * Smooth Tire Friction Number of Innovative Grind is Equal or Higher than Ribbed Tire |