**TRANSPORTATION POOLED FUND PROGRAM**

**QUARTERLY PROGRESS REPORT**

Lead Agency (FHWA or State DOT): \_\_Washington State 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 #***(i.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX)*TPF-5(386) | **Transportation Pooled Fund Program - Report Period:**□XXQuarter 1 (January 1 – March 31) 2024□Quarter 2 (April 1 – June 30)□Quarter 3 (July 1 – September 30)□Quarter 4 (October 1 – December 31) |
| **Project Title:****Gravel-Bed River Assessment Tool for Improved Resiliency of Engineering Design** |
| **Name of Project Manager(s):****Cygnia Rapp – Technical Monitor****Jon Peterson – Research Manager** | **Phone Number:****(360) 705-7415****(360) 705-7499** | **E-Mail**rappcyg@wsdot.wa.govpeterjn@wsdot.wa.gov |
| **Lead Agency Project ID:** | **Other Project ID (i.e., contract #):** | **Project Start Date:**September 2018 |
| **Original Project End Date:** | **Current Project End Date:****September 30, 2024** | **Number of Extensions:** |

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** |
| $365,000 |  |  |

***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** |
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| **Project Description**:**Background:**The world’s rivers and streams are adjusting to changes in climate. In Washington State, stream channels are becoming more dynamic – especially in the vicinity of gravel-bed rivers. Federal, state, tribal and private roads are increasingly compromised or destroyed due to progressively more dynamic channel processes. A river’s bedload (sediment transported along the channel bed) drives how rivers move into – or away from – road infrastructure. In order to design durable roads and bridges, we need high quality information on how the natural material in the river system will move and deposit in the vicinity of road infrastructure. Widely available methods for assessing channel dynamics and hazards are based on sand-bed rivers, like the Mississippi River, that do not apply to gravel-bed rivers found throughout the United States. We need a gravel-bed river assessment tool that accounts for changes in gravel-bed rivers from glacial melt and extreme flooding associated with projected future climate change. In this pilot, WSDOT proposes to develop practical guidance and methods for assessing bedload transport in gravel-bed rivers for more resilient road infrastructure. This guidance will inform engineering design, hazard assessment, and maintenance strategies of roads along or near gravel-bed rivers. Other federal and state agencies support the pilot, and are willing to assist in the development and review process. WSDOT anticipates that US Forest Service, US Fish and Wildlife Service, Oregon DOT, Caltrans and other public works agencies will use the gravel-bed assessment tool developed by this pilot project. **Objectives:**This pilot will consist of three parts: 1. A technical workshop to define the framework, goals, and criteria for developing the guidance and case studies. 2. Data collection and case study development. 3. The guidance write-up and finalization  |

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| **Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):**Guidance Document: The document outline was substantially revised to include a chapter on developing techniques in sediment budgets for informing sediment transport assessment and development of the conceptual model used in a sediment transport model. Dr Tim Abbe was successfully retained to assist with document development. Cygnia Rapp composed a draft chapter on techniques for sediment budgets that is currently under review and revision by Dr. Abbe. This is a cornerstone chapter for the document that will inform targeting the focus of geomorphic assessment techniques to support the development of sediment budgets and sediment transport models.  Methow River case study: Substantial progress has been made getting an initial hydraulic model up and running for executing the sediment transport module. The existing conditions terrain is nearly completed with progress on other scenarios. Dr. Curran completed her review of the bedload data and other existing data sets for a preliminary sediment rating curve. The goal has been to complete as much work up front as possible prior to field efforts scheduled in August.Upper Skagit River case study: Cygnia Rapp and Dr. Wes Lauer are in discussions with Seattle City Light for directly contracting with Dr. Lauer to develop and co-author the case study. WSDOT is unable to contract with Seattle University directly.Glacier Creek case study: Nothing to report on this just yet. |
| **Anticipated work next quarter**:Cygnia Rapp has a meeting planned with FHWA in June to review the status of the project and determine whether a no-cost extension will be required.Guidance document: Complete the sediment budget chapter and begin work on the geomorphic assessment chapter. Methow River case study: Field work is scheduled in August. The team is working on completing as much work as possible before then. Dr Joanna Crowe Curran and Cygnia Rapp will begin co-authoring the background sections of the write up. Cygnia Rapp will develop the sediment budget field work plan.Upper Skagit River case study: The USGS is on standby for sampling bedload on the Cascade River near Marblemount. We hope to get Dr. Wes Lauer under contract before June.Glacier Creek: Develop the sediment budget work plan. |

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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).** |

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| **Potential Implementation:** The final product of the pilot study will be the publication of WSDOT’s guidance and methods. These will be applicable to state DOTs and other highway asset managers across the nation wherever gravel-bed riversare found.  |