

**TRANSPORTATION POOLED FUND PROGRAM  
QUARTERLY PROGRESS REPORT  
Q4/2025**

Lead Agency:  
**Washington State Department of Transportation (WSDOT)**

**INSTRUCTIONS:**

*Lead Agency contacts 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.*

<b>Transportation Pooled Fund Program Project #</b> <a href="#">TPF-5(491)</a>		<b>Transportation Pooled Fund Program - Report Period:</b> <input checked="" type="checkbox"/> Quarter 1 (January 1 – March 31) <input type="checkbox"/> Quarter 2 (April 1 – June 30) <input type="checkbox"/> Quarter 3 (July 1 – September 30) <input type="checkbox"/> Quarter 4 (October 1 – December 31)	
<b>TPF Title</b> (follow link to TPF webpage): <a href="#">Super-Elastic Copper-Based and Iron-Based Shape Memory Alloys and Engineered Cementitious Composites for Extreme Events Resiliency</a>			
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<b>Lead Agency Project ID:</b> UCB 1874	<b>Other Project ID (i.e., contract #):</b> T-1874	<b>Project Start Date:</b> 2022-12-01	
<b>Original Project Start Date:</b> 2022-12-01	<b>Original Project End Dates:</b> Phase 1 - 2023-11-30 Phase 2 – 2025-11-30 Phase 2 task 6 – 2026-04-30	<b>If Extension has been requested, updated project End Date:</b> 2026-04-30	

**Project schedule status:**

- On schedule       On revised schedule       Ahead of schedule       Behind schedule

**(A) Overall Project Statistics:**

<b>Commitments to date \$ (3yrs)</b>	<b>Obligations to date \$</b>	<b>% Obligated</b>	<b>Contracted to date \$</b>	<b>Expended to date \$</b>	<b>Expended to date as % of contracted</b>	<b>Completed this quarter \$</b>
450,000	450,000	100%	449,431	441,236	98.18%	4,671

**(B) Project Description:**

The objective of this research project is to:

1. evaluate and test several innovative columns which have self-centering feature to provide minimum residual displacement after earthquake.
2. improve column serviceability after earthquake by decreasing damage and spalling of concrete within column plastic hinge region; and
3. provide cost comparison among columns having different engineered materials; and
4. develop self-centering column design specifications. Particularly, in this proposed research, the low-cycle fatigue characteristics, corrosion resistance, machinability and coupling mechanisms with traditional steel rebar, and cost of CAM, NiTiCo super-elastic alloy (SEA) bars and Fe-SMA shape memory alloy (SMA) bars are being studied.

Direct comparisons are made with Nickel-Titanium (NiTi) SEAs (and traditional steel reinforcing bars as applicable) to illustrate the advantages/disadvantages of each material. If successfully demonstrated for their suitable characteristics, the NiTiCo SEA and Fe-SMA bars could replace their NiTi counterparts at a significantly lower cost and accelerate their applications in bridges. Therefore, the outcomes of this project are directly relevant to state departments of transportation and bridge and structural engineers and designers. This proposed project will build on the success of previously implemented WSDOT's application of shape memory alloy/engineered cementitious composite (SMA/ECC) in the columns of the SR-99 on-ramp bridge in downtown Seattle while making a direct impact on advancing and securing the national transportation network.

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

In this quarter the final report has been submitted to the sponsor, and the comments received from the reviewers (over 100) have been incorporated.

**(D) Anticipated work next quarter:**

The project has ended and no work will be performed in the next quarter.

**(E) Significant Results:**

A very comprehensive final project report include an extensive design examples appendix has been prepared and submitted to the sponsor.

**(F) 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).**

N/A

**(G) Potential Implementation:**

N/A