

## TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): Virginia DOT (VDOT)

**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.*

<b>Transportation Pooled Fund Program Project #</b> <i>(i.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX))</i>  <b>TPF-5(268)</b>  <b>National Sustainable Pavement Consortium</b>		<b>Transportation Pooled Fund Program - Report Period:</b>  <input type="checkbox"/> Quarter 1 (January 1 – March 31) <input type="checkbox"/> Quarter 2 (April 1 – June 30) <input checked="" type="checkbox"/> Quarter 3 (July 1 – September 30) <input type="checkbox"/> Quarter 4 (October 1 – December 31)	
<b>Project Title:</b>  <div style="text-align: center;"><b>National Sustainable Pavement Consortium</b></div>			
<b>Name of Project Manager(s):</b> Ben Bowers	<b>Phone Number:</b> (434) 293-1423	<b>E-Mail</b> <a href="mailto:Ben.Bowers@vdot.virginia.gov">Ben.Bowers@vdot.virginia.gov</a>	
<b>Lead Agency Project ID:</b> VCTIR 103567	<b>Other Project ID (i.e., contract #):</b> 448679	<b>Project Start Date:</b> 7/1/2012	
<b>Original Project End Date:</b> 6/30/2018	<b>Current Project End Date:</b> 6/30/2018	<b>Number of Extensions:</b> 0	

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
\$558,944 <sup>1</sup>	\$463,251	83%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
\$24,157 (4.3%)	\$24,197	83%

<sup>1</sup> Contracted; total commitment \$665,000

**Project Description:**

Through a regional pooled fund, this program of research focuses on enhancing pavement sustainability. The initial project scope covers:

- ✓ Examine emerging sustainable materials, technologies, products and pavement systems, how to facilitate their adoption, and what testing approaches and methods are needed to implement these technological improvements.
- ✓ Identify an appropriate set of metrics that comprises all aspects of pavement sustainability and the adaption or development of tools designed to assess pavement sustainability on qualitative and quantitative scales.
- ✓ Examine how sustainability considerations will affect all aspects of pavement engineering and management such as planning, design, construction, maintenance, management, and reclamation and develop guidelines for integration of these tools into pavement/ asset management business processes.
- ✓ Investigate the effect of climatic change on regional pavement engineering in terms of design, construction, maintenance, and management.

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

- Continued work on incorporating LCA into the pavement-type selection process.
  - ✓ Completed a paper comparing various pavement LCA tools (attached). The paper has been accepted for presentation at the Annual meeting of the Transportation Research Board.
- Continued work on integrating life-cycle environmental and cost assessment tools for supporting pavement management.
  - ✓ Published a journal paper with an application of the proposed methodology in the journal *Resources, Conservation & Recycling*.
- Participated in the 11<sup>th</sup> National Transportation Asset Management Conference with two contributions.
- Continued work on synthesizing long-term performance data from states with active in-place recycling programs.
  - ✓ Prepared a paper describing a pilot the sections constructed in Virginia. The paper has been accepted for presentation at the Annual meeting of the Transportation Research Board.
- Hold a WebEx Meeting of the Technical Advisory Board on September 29, 2016.

**Anticipated work next quarter:**

- Plan the participation in the final twinning meeting with LCE4Roads and prepare a presentation about the work of the consortium for the 1<sup>st</sup> European Road Infrastructure Congress
- Continue work on the synthesis of long-term performance data from states with active in-place recycling programs.
- Initiate a project on Influence of additives on mix design of in-place recycled materials.
- Organize the Fourth Technical Oversight Workshop.

**Significant Results:**

- Santos, J., Flintsch, G. and Ferreira, A. (2017). "Environmental and economic assessment of pavement construction and management practices for enhancing pavement sustainability," *Resources, Conservation & Recycling*, 116, pp. 15-31, DOI:10.1016/j.resconrec.2016.08.025.
- Amarh, E., Fernandez-Gomez, W., Flintsch G.W., Diefenderfer, B., Bowers, B., "Non-Destructive In Situ Characterization of Elastic Moduli of Full-Depth Reclamation Base Mixtures," paper accepted for presentation at the 2017 *Annual Meeting of the Transportation Research Board*, January 8-12, 2017, Washington, DC.
- Santos, J., Thyagarajan, S., Keijzer, E., Fernandez Florez, R., Flintsch, G. Comparison of Life Cycle Assessment Tools For Road Pavement Infrastructure," paper accepted for presentation at the 2017 *Annual Meeting of the Transportation Research Board*, January 8-12, 2017, Washington, DC.
- Santos J., Ferreira, A., Flintsch, G. and Cerezo, V., "Consideration of life cycle greenhouse gas emissions in a multi-objective optimization approach for sustainable pavement maintenance and rehabilitation programming." Fifth International Symposium on Life-Cycle Civil Engineering, Oct 16-19, Delft, the Netherlands.

**Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that might the completion of the project within the time, scope and fiscal constraints set forth in the agreement, along with recommended solutions to those problems).**

No problems were encountered in this quarter.

**Potential Implementation:**