

## TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Date: 09/30/2015

Lead Agency (FHWA or State DOT): Vermont Agency 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.*

<b>Transportation Pooled Fund Program Project #</b> <i>(i.e., SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX))</i>  TPF-5(222)		<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> New England Transportation Consortium (VI)			
<b>Name of Project Manager(s):</b> Bill Ahearn		<b>Phone Number:</b> 802-828-2561	
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<b>Lead Agency Project ID:</b> CA0306		<b>Other Project ID (i.e., contract #):</b> NETC 06-4 NETC 07-1 NETC 09-2 NETC 09-3 NETC 10-3 NETC 13-1 NETC 13-2 NETC 13-3 NETC 14-1 NETC 14-2	
		<b>Project Start Date:</b> 9/16/13 7/1/13 9/1/13 9/1/13 9/16/13 9/1/14 6/1/14 12/1/14 3/1/15 2/1/15	
<b>Original Project End Date:</b> NETC 06-4 9/15/15 NETC 07-1 3/31/16 NETC 09-2 2/28/16 NETC 09-3 8/31/15 NETC 10-3 9/15/15 NETC 13-1 8/31/16 NETC 13-2 5/31/16 NETC 13-3 11/30/15 NETC 14-1 4/2/16 NETC 14-2 4/2/16		<b>Current Project End Date:</b> 9/15/15 (NCE requested 9/15/16) 3/31/16 2/28/16 8/31/15, NCE to 12/31/15 9/15/15 4/2/16 (original proposal 8/31/16) 4/2/16 (original proposal 5/31/16) 3/31/16 4/2/16 (original proposal 8/31/16) 4/2/16 (original proposal 5/31/16)	
		<b>Number of Extensions:</b> 0 (1 pending NCE for NETC) 0 0 1 (NCE approved 6/23/15) 0 (1 pending NCE for NETC) 0 (1 pending NCE for NETC) 0 (1 pending NCE for NETC) 1 0 (1 pending NCE for NETC) 0 (1 pending NCE for NETC)	

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
NETC 06-4	\$242,909	\$54,565.81	30%
NETC 07-1	\$198,154	\$116,054.34	75%
NETC 09-2	\$80,000	\$78,811.11	55%
NETC 09-3	\$165,000	\$113,593.68	81%
NETC 10-3	\$150,158	\$47,181.64	40%
NETC 13-1	\$174,923	\$75,211.98	50%
NETC 13-2	\$249,785	\$0	10%
NETC 13-3	\$100,000	\$21,342.68	40%
NETC 14-1	\$100,000	\$6,490.21	5%
NETC 14-2	\$205,554	\$13,912.10	35%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter			Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
NETC 06-4	\$42,304.32	0%	\$12,261.49	100% (based on 24 months)
NETC 07-1	\$116,054.34	0%	\$0.00	82% (based on 33 months)
NETC 09-2	\$20,415.38	0%	\$53,725.46	90% (based on 30 months)
NETC 09-3	\$110,168.38	0%	\$3,425.30	89% (based on 28 months)
NETC 10-3	\$30,835.52	0%	\$8,346.12	102% (based on 24 months)
NETC 13-1	\$39,016.86	15%	\$36,195.12	53.5% (based on 24 months)
NETC 13-2	\$0	0%	\$0	62.5% (based on 24 months)
NETC 13-3	\$13,847.91	20%	\$7,494.77	50% (based on 12 months)
NETC 14-1	\$0	5%	\$6,490.21	38.7% (based on 18 months)
NETC 14-2	\$0	20%	\$13,912.10	32.5% (based on 24 months)

**Project Description:**

- 06-4 Preventative Maintenance and Timing of Applications
- 07-1 In-Place Response Mechanisms of Recycled Layers Due to Temperature and Moisture Variations
- 09-2 Effective Establishment of Native Grasses on Roadsides
- 09-3 Advanced Composite Materials: Prototype Development and Demonstration
- 10-3 Low Temperature and Moisture Susceptibility of RAP Mixtures with Warm Mix Technology
- 13-1 Development of High-Early Strength Concrete for Accelerated Bridge Construction Closure Pour Connections
- 13-2 HMA Mixtures Containing Recycled Asphalt Shingles (RAS): Low Temperature and Fatigue Performance of Plant-Produced Mixtures
- 13-3 Improved Regionalization of Quality Assurance (QA) Functions
- 14-1 Measuring the Effectiveness of Competency Models for Job-Specific Professional Development of Engineers & Engineering Technicians
- 14-2 Investigation of Northern Long Eared Bat Roosting Sites on Bridges

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

NETC 06-4, No progress reported this quarter.

NETC 07-1, This quarter has been focused on processing and analysis of the FWD test data. The frost – thaw depth plots with the adjusted center deflection measurements during the spring thaw and recovery period are shown in Figures 1-3 for the three Kancamagus sections (similar plots for the other sites were presented in the last quarterly report). Processing

of the FWD test data for input to a back calculation software has been completed this quarter. The objective of back calculation will be to evaluate the contribution of different depths during freezing and thawing conditions and examine the modulus over time. The back calculated modulus values will also be compared to modulus values estimated from deflection measurements using available equations.

NETC 09-2, Maintenance of the demonstration sites along Rt. 6:

During July1-September 30:

- Kuzovkina and Campanelli conducted weekly visits to the three sites to evaluate the germination rates of newly planted plots along Rt. 6.
- Maintenance of the plots with grasses and forbs to control weed pressure. Applications of Round Up and Plateau to the newly established small plots along Rt.6.

July8: Campanelli visited Ernst Conservation Co to discuss various protocols for the production of native grasses and forbs.

September 9-11: Campanelli visited Iowa DOT Native Grass Establishment Program

September 15-17: Campanelli participated in the National Vegetation Management Association Conference (Roanoke, Virginia)

September: preparation for the DOT workshop and Field Day "EFFECTIVE ESTABLISHMENT OF NATIVE GRASSES AND FORBS ON ROADSIDES"

28 attendees included New England state Department of Transportation managers and representatives from Northeast native nurseries, including Arch(E)Wild, Earth Tones, and New England Wetland Plants

Presentations and Discussions included the following topics: • Effective methods for establishing and maintaining warm season native grasses and forb meadows along roadsides • Ecological, environmental, and economic benefits of native warm-season meadows vs cool-season turf grasses • Proper site preparation and the control competition from weeds and cool-season grasses • Decreasing fuel costs and emissions with reduced mowing • Designing seed mixes • Importance of creating seed banks of local New England native plant ecotypes • Building pollinator habits • Benefits of meadows for stormwater runoff management.

NETC 09-3, No progress reported this quarter.

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NETC 10-3, No progress reported this quarter.

NETC 13-2, No progress reported this quarter.

NETC 13-3, In this quarter the researchers continued their work on the review of the QA processes of the New England State DOTs. The researchers reviewed additional specifications and QA process documents from the agencies (additional to what was done last quarter) and also continued review of literature on the topic. Visits for interview with the DOT personnel was conducted for two more agencies (Massachusetts and Vermont). The data from the visits as well as the data from review of the specifications and manuals is being reduced into set of tables for easy comparison of pertinent information.

Some of the early findings on the QA processes for PCE/PSE of the New England DOTs on the basis of review of the specifications and manuals of practices are as follows:

- The plant qualification procedures are comparable between agencies and PCI certification is most commonly used pre-qualification criteria for PSC producing facilities.
- The quality control requirements put-forth by the agencies for the producers utilized requirements described by PCI MNL-116.

- The unification of the inspection and acceptance testing procedures were identified as the critical step in moving towards potential for cross-utilization of resources between agencies.
- The six New England DOTs represent full spectrum practices when it comes to use of in-house versus consultant inspectors for PCE and PSE.
- Majority of baseline (pre-pour, during pour, post-pour, distressing, form stripping, early and design strength) inspection and acceptance testing activities are similar between the agencies. Some additional tests are being used by some agencies, such as permeability and testing associated with accelerated curing.
- A few currently utilized practices as well as some that are currently under implementation at various DOTs could really aid in implementation of the unified QA process between New England DOTs. For example, use of RFID (Radio Frequency Identity) tag with cloud based data-storage system that is being evaluated by MassDOT could serve as a vehicle for management of information and the use of "Shift Planning" system used by VTrans can make it streamlined to keep database of eligible inspection personnel in the region, their availability as well as tracking of their work hours.

NETC 14-1, The kickoff meeting was held on 9/25/15.

The technical committee discussed the goals of the project, scheduling, and progress on Tasks 1 and 2.

The planned schedule is for completion of:

- Task 1 by mid-November 2015.
- Tasks 2 and 3 – Determine Gaps and Develop a CM Framework - by mid-February 2016.
- Task 4 – Pilot Program - at the end of June 2016.
- Task 5 – Final Report - at the end of August 2016.

Task 1 involves researching existing competency models and matrices. A number of articles and references have been found; however, specific models for DOT's have been more difficult to identify than anticipated. Work on Task 1 will continue.

Task 2 involves determining gaps in existing competency models. The technical committee agreed that a good first step would be to propose standard employment classifications for both technicians and civil engineers within a DOT. The competency model developed will then be based on those standard classifications. Research on existing grades within DOT's is underway. A proposal on standard grades is scheduled for our next technical committee meeting, which will be in November.

Maine offered to host the pilot Program.

NETC 14-2

- Acoustic monitoring equipment and software received
- Infra-red software received
- Miscellaneous supplies purchased for field work
- GIS software used to integrate maps with National Bridge Inventory to determine routes for visual screening and instrumentation
- Completed Rapid Visual Screening of 182 bridges in VT, NH, RI, ME and MA to evaluate for signs of roosting to narrow down instrumented structures and evaluate structural characteristics of regional bridges and likelihood of roosting
- Selected 15 bridges for monitoring in Summer 2015
- Acoustic monitoring of 15 bridges during maternity roosting season
- Acoustic monitoring of 15 bridges during post-maternity roosting season
- Preliminary evaluation of thermal imaging camera and data from one bridge
- Initial screening of data
- Initial reporting of bridge characteristics including signs of structural causes of staining and signs of possible bat roosting

**Anticipated work next quarter:**

NETC 06-4, No work projected at this time.

NETC 07-1, The research team will complete the back calculation of modulus values from the FWD testing and compare with estimated values from FWD deflection measurements in the upcoming quarter. The research team will also begin preparation of the final report in the coming quarter.

NETC 09-2, Manual writing. Continue to provide maintenance of the demonstration plots.

NETC 09-3, No work projected at this time.

NETC 10-3, No work projected at this time.

NETC 13-1, Task 1: Literature Search

Continue literature search as required.

Task 2: Develop Mixture Design Specification

Adjust existing concrete mix design specifications based on feedback from the NETC Project Technical Committee, trial batch results, and feedback from the PCI Bridge Tech Committee.

Task 3: Develop Mix Design

Finalize trial batch mixture that will be subject to the remaining concrete property testing. The trial batch must reach the compressive strength, slump and set time goals, and have qualitatively acceptable workability.

Task 4: Test Mixture

Execute shrinkage test (AASHTO PP 34-99) on the soon to be selected trial batch mixture.

Begin design and fabrication of bar pullout test (ASTM A944) setup.

NETC 13-2, No work projected at this time.

NETC 13-3, -Interview with DOT engineers and QA inspectors for CT (Scheduled on October 16th)

-Visit of PCE/PSE facility and interview of fabricator(s) as well as New England PCI (One visit tentatively scheduled to J P Carrera in VT on October 20th)

-Compilation and submission of the summary report on the review of New England State DOT QA Processes for Precast and Prestressed Concrete Elements in Highway Construction.

-Continued development of draft common acceptance standards

NETC 14-1, Complete Task 1 and offer the results for review by the technical committee

Create standard employment classifications for technicians and civil engineers and present those to the technical committee for review. Determine gaps between existing CM's and standard classifications

Begin development of a CM framework.

NETC 14-2

- Analysis of data from Summer 2015
- Complete draft of background information for final report
- Technical Committee meeting on October 20, 2015
- Purchase borescope and take trial readings/observations at selected bridges
- Contact regional personnel for updated Summer 2015 data related to NLEB
- Develop monitoring plan for Summer 2016 for distribution to Technical Committee
- Prepare presentation for TRB Annual Meeting

#### **Significant Results:**

None as of this reporting period.

**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).**

NETC 06-4, Current End Date for this project is 9/15/15. UMass Dartmouth requested a no-cost time extension in order to include more new pavement preservation projects ongoing in the New England states to this study, investigate and

purchase the needed testing devices, and to allow more time for field evaluation of the preservation projects included in the study. The requested time extension was for one year with a new end date of 9/15/2016. New End Date is beyond NETC contract end-date. NCE approval is waiting for NCE to NETC Contract.

NETC 07-1, None during the current period.

NETC 09-2, No problems were encountered during this reporting period.

NETC 09-3, None during the current period.

NETC 10-3, In September 2014, UMass Dartmouth formally requested a no additional cost time extension for this project of twelve month (new end date 9/15/2016). The basis of the request is that the contractors have not produced or provided the mixtures required for this study. The Technical Committee did not approve the NCE request, and decided to hold off on submitting the NCE request until after samples were received from the contractors. NETC 10-2 has 2.5 months remaining of the 24 month project. The percent of work completed is 40%. The End Date is now less than 90 days. The NETC Coordinator contacted the Technical Committee and is awaiting a recommendation for the future of this project. A NCE was requested and approved by the Technical Committee. It is now pending setup with UVM.

NETC 13-1, No problems encountered to date. The proposed project period was 24 months. However, the NETC coordinator's contract end date is 4/2/16, and the project cannot be contracted past that end date. The project will require a NCE for end date 8/31/16 as soon as the NETC contract NCE is approved.

NETC 13-2, The project period is 62.5% complete with only 10% of the project tasks completed, and no expenses have been invoiced to date. The proposed project period was 24 months. However, the NETC coordinator's contract end date is 4/2/16, and the project cannot be contracted past that end date. The project will require a NCE for end date 5/31/16 as soon as the NETC contract NCE is approved

NETC 13-3, None during the current period.

NETC 14-1, Notice to proceed was received three months past the project start date. The proposed project period was 18 months, ending 8/31/16. However, the NETC contract end date is 4/2/16. The project will require a NCE for end date 8/31/16 as soon as the NETC contract NCE is approved.

NETC 14-2

- Notice to proceed was three months past the project start date. The project relies on data collected during summer months, requiring work during summer 2016 to complete the project.
- Project notice to proceed precludes any 2015 data from early season (pre-maternity roosting).
- Interactions with Fish and Wildlife, DOT and other organization personnel did not identify any new bridges with known or likely bat presence (per Tasks 1 and 3). Therefore more effort than anticipated will be involved in rapid visual screening of bridges to identify specific bridges for monitoring program. Currently over 70 bridges have been screened in VT, NH, RI and MA by the project team while awaiting equipment. Based on these initial interviews it is expected that the scope of Task 3 will need to be revised.
- Acoustic monitoring equipment was on backorder, most received in late June.
- External battery cables and Sonobat software are still not received by UMass.
- Personnel on project will differ from proposed. Two undergraduate research assistants have been hired to assist a graduate student (funded by NSF scholarship) working on the project. This will be re-evaluated for the second year.
- The proposed project period was 24 months, ending 5/31/16. However, the NETC contract end date is 4/2/16. The project will require a NCE for end date 8/31/16 as soon as the NETC contract NCE is approved.

**Potential Implementation:**

The 10 research projects listed above are still in progress. Implementations of the results of those projects are not anticipated in the near future.