

**Quarterly Progress Report:**

**Project Number and Title:** C9.2019: A new method of determining payment for in-place concrete with double-bounded compressive strength pay factors

**Research Area:** Thrust 3: New systems for longevity and constructability

**PI:** James L. Sullivan, UVM Transportation Research Center

**Co-PI(s):** David C. Novak, UVM Grossman School of Business

Eric Hernandez, UVM College of Engineering and Mathematical Sciences

**Reporting Period:** 7/1/2021 - 9/30/2021

**Submission Date:** September 9, 2021

**Overview:**

Provide **BRIEF** overview and summary of activities performed during the reporting period.

- Task 2 of the project scope was continued during this reporting period
- The final project report was begun during this reporting period

Provide context as to how these activities are helping achieve the overarching goal(s) of the project...

Task 1 was the technical approach for the project, so it was critical to complete it first. The second and third tasks utilize the new approach. The third task was conducted before the second so that additional testing and troubleshooting of the MS Excel tool could be conducted during the execution of Task 2. Currently the tool is being used to demonstrate the new approach with 5-year forecast scenarios.

Describe any accomplishments achieved under the project goals...

The MS Excel tool that is needed to put the new approach into practice is complete and ready to use. The tool is being used to complete Task 2 as further testing of its quality and comprehensiveness..

Complete the following tables to document the work toward each task and budget

<b>Table 1: Task Progress</b>			
<b>Task Number</b>	<b>Start Date</b>	<b>End Date</b>	<b>% Complete</b>
Task 1:	October 1, 2020	March 31, 2021	100
Task 2:	April 1, 2021	September 30, 2021	80
Task 3:	October 1, 2021	March 31, 2022	100
Reporting:	January 1, 2022	March 31, 2022	40
Overall Project:	October 1, 2020	March 31, 2022	80

<b>Table 2: Budget Progress</b>		
<b>Project Budget</b>	<b>Spend – Project to Date</b>	<b>% Project to Date*</b>
\$166k	\$134k	80%

Describe any opportunities for training/professional development that have been provided...None

Describe any activities involving the dissemination of research results (be sure to include outputs, outcomes, and the ways in which the outcomes/outputs have had an impact during the reporting period. Please use the tables below for any Publications and Presentations in addition to the description of any other technology transfer efforts that took place during the reporting period. )... Use the tables below to complete information about conferences, workshops, publications, etc. **List all other outputs, outcomes, and impacts after the tables** (i.e. patent applications, technologies, techniques, licenses issued, and/or website addresses used to disseminate research findings).

**Table 3: Presentations at Conferences, Workshops, Seminars, and Other Events**

Title	Event	Type	Location	Date(s)
Double-bounded compressive strength pay factors for determining payment of in-place concrete	2020 VTrans Research and Innovation Symposium	Symposium	Virtual	September 9, 2020
A new method of determining payment for in-place concrete with double-bounded compressive strength pay factors	2021 VTrans Research and Innovation Symposium	Symposium	Virtual	September 8-9, 2020

**Table 4: Publications and Submitted Papers and Reports**

Type	Title	Citation	Date	Status
i.e. Peer-reviewed journal, conference paper, book, policy paper	Publication title	Full citation		i.e. submitted, accepted, under review

*Encouraged to add figures that may be useful (especially for the website)...*

**Participants and Collaborators:**

*Use the table below to list all individuals who have worked on the project.*

**Table 5: Active Principal Investigators, faculty, administrators, and Management Team Members**

Individual Name	Email Address	Department	Role in Research
James L. Sullivan	james.sullivan@uvm.edu	Transportation Research Center	Primary analyst & principal investigator
David C. Novak	david.novak@uvm.edu	Grossman School of Business	Technical advisor & co-principal investigator
Eric Hernandez	eric.hernandez@uvm.edu	College of Engineering and Mathematical Sciences	Technical advisor & co-principal investigator

*Use the table below to list all students who have participated in the project during the reporting. (This includes all paid, unpaid, intern, independent study, or any other student that participated in this project.)*

**Table 6: Student Participants during the reporting period**

Student Name	Email Address	Class	Major	Role in research
James L. Sullivan	james.sullivan@uvm.edu	Ph.D.	Civil Engineering	Primary analyst & principal investigator

*Use the table below to list any students who worked on this project and graduated during this reporting period.*

**Table 7: Student Graduates**

Student Name	Role in Research	Degree	Graduation Date
--------------	------------------	--------	-----------------

--	--	--	--

Use the table below to list organizations have been involved as partners on this project and their contribution to the project.

<b>Table 8: Research Project Collaborators during the reporting period</b>						
<b>Organization</b>	<b>Location</b>	<b>Contribution to the Project</b>				
		<b>Financial Support</b>	<b>In-Kind Support</b>	<b>Facilities</b>	<b>Collaborative Research</b>	<b>Personnel Exchanges</b>
Vermont Agency of Transportation, Materials & Certification Section	Barre, Vermont		X			

List all other outputs, outcomes, and impacts here (i.e. patent applications, technologies, techniques, licenses issued, and/or website addresses used to disseminate research findings). Please be sure to provide detailed information about each item as with the tables above.

Have other collaborators or contacts been involved? If so, who and how? (This would include collaborations with others within the lead or partner universities; especially interdepartmental or interdisciplinary collaborations.)

<b>Table 9: Other Collaborators</b>			
<b>Collaborator Name and Title</b>	<b>Contact Information</b>	<b>Organization and Department</b>	<b>Contribution to Research</b>
Nicholas Van Den Berg, Materials & Certification Manager	Nick.VanDenBerg@vermont.gov	VTrans Materials & Certification Section (Construction & Materials Bureau)	Technical Champion

Who is the Technical Champion for this project?

Name: Nicholas Van Den Berg

Title: Materials & Certification Manager

Organization: VTrans Materials & Certification Section (Construction & Materials Bureau)

Location: Barre, Vermont

Email: [Nick.VanDenBerg@vermont.gov](mailto:Nick.VanDenBerg@vermont.gov)

**Changes:**

Discuss any actual or anticipated problems or delays and actions or plans to resolve them...None

Discuss any changes in approach and the reasons for the change...None

**Planned Activities:**

We plan to complete work on Task 2 in the next quarter and complete the final report for the project.

We also plan to convene the third meeting of the project TAC in the next quarter.