

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: 4/1/2021 - 6/30/2021

Submission Date: July 25, 2021

Overview:

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

- Task 3 of the project scope was completed during this reporting period.
- Task 2 of the project scope was initiated and advanced 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

| Table 1: Task Progress | | | |
|-------------------------------|-------------------|--------------------|-------------------|
| Task Number | Start Date | End Date | % Complete |
| Task 1: | October 1, 2020 | March 31, 2021 | 100 |
| Task 2: | April 1, 2021 | September 30, 2021 | 50 |
| Task 3: | October 1, 2021 | March 31, 2022 | 100 |
| Reporting: | January 1, 2022 | March 31, 2022 | 20 |
| Overall Project: | October 1, 2020 | March 31, 2022 | 60 |

| Table 2: Budget Progress | | |
|---------------------------------|--------------------------------|---------------------------|
| Project Budget | Spend – Project to Date | % Project to Date* |
| \$166k | \$90k | 54% (as of July 25, 2021) |

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) |
|--------------------|---|--------------------------------------|----------|---------|
| Presentation title | Name of event (i.e. TIDC 1 st Annual Conference) | i.e. Conference, Symposium, Seminar, | | |
| | | | | |

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 | | 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.

Table 8: Research Project Collaborators during the reporting period

| Organization | Location | Contribution to the Project |
|--------------|----------|-----------------------------|
| | | |

| | | Financial Support | In-Kind Support | Facilities | Collaborative Research | Personnel Exchanges |
|---|----------------|--------------------------|------------------------|-------------------|-------------------------------|----------------------------|
| 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.)

| Table 9: Other Collaborators | | | |
|--|-----------------------------|--|---------------------------------|
| Collaborator Name and Title | Contact Information | Organization and Department | Contribution to Research |
| 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

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 substantially complete the final report for the project.

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