

Quarterly Progress and Performance Indicators Report:

Project Number and Title: 4.1 Connected Vehicles Applications to Improve Infrastructure Safety and Durability

Research Area: Thrust 4 Connectivity for Enhanced Asset and Performance Management

PI: Jonathan Rubin, University of Maine

Co-PI(s): Kathryn Ballingall, University of Maine

Reporting Period: 01/01/2022-03/31/2021)

Submission Date: 03/31/2022

Overview:

Provide **BRIEF** highlights of activities performed during the reporting period.

- The closure of campus due to COVID as well as staffing capacity has put the pilot operation and data collection on hold.

Meeting the Overarching Goals of the Project:

How did the previous items help you achieve the project goals and objects? Please give one bullet point for each bullet point listed above.

- N/A

Accomplishments:

List any accomplishments achieved under the project goals in bullet point form...

- The completion of the pilot project is on hold, however, our team is continuing to meet with DOT to discuss plans and needs for advancing the installation of connected vehicle technology and applications in Maine. The DOT is currently applying for grants for more ITS and connected vehicle projects in Maine.

Task Progress and Budget:

Complete the following tables to document the work toward each task and budget (add rows/remove rows as needed, make sure you complete the Overall Project progress row and include all tasks even if they have ended or have not been started)...

Table 1: Task Progress

Task Number: Title	Start Date	End Date	% Complete
Task 1	October 1, 2018	December 30, 2021	90%
Task 2	October 1, 2018	December 30, 2021	90%
Task 4	October 1, 2018	December 30, 2021	60%
Task 5	September 1, 2019	December 30, 2021	20%
Task 6	December 1, 2019	December 30, 2021	5%
Task 7	September 1, 2019	December 30, 2021	25%
Overall Project:	October 1, 2018	December 30, 2021	80%

Table 2: Budget Progress

Project Budget	Spend – Project to Date	% Project to Date (include the date)
\$253,696	\$141,988	55.97%

Is your Research Project Applied or Advanced?

Applied *(The systematic study to gain knowledge or understanding necessary for determining the means by which a recognized and specific need may be met.)*

Advanced *(An intermediate research effort between basic research and applied research. This study bridges basic (study to understand fundamental aspects of phenomena without specific applications in mind) and applied research and includes transformative change rather than incremental advances. The investigation into the use of basic research results to an area of application without a specific problem to resolve.)*

Professional Development/Training Opportunities:

Describe any opportunities for training/professional development that have been provided. Did you provide a training to a State DOT/AOT or industry organization? What was the training? When was it offered? How many people attended? Did you meet with a State DOT/AOT or industry organization to inform them of your findings and how these findings could help their organization? When? How many attended the meeting?

- N/A

Technology Transfer:

Complete all of the tables below and provide additional information where requested.

Use the table below to complete information about conference sessions, workshops, webinars, seminars, or other events you led/attended where you shared findings as a result of the work you conducted on this project:

Table 3: Presentations at Conferences, Workshops, Seminars, and Other Events					
Type	Title	Citation	Event	Location	Date(s)
i.e. Conference, Symposium, DOT/AOT presentation, Seminar, etc.	Presentation Title	Full Citation	Name of event (i.e. TIDC 1 st Annual Conference) or who was the presentation given to?		
N/A	N/A	N/A	N/A	N/A	N/A

Use the table below to report any publications, technical reports, peer-reviewed articles, newspaper articles referencing your work, graduate papers, dissertations, etc. written as a result of the work you conducted on this project. Please list only completed items and exclude work in progress.

Table 4: Publications and Submitted Papers and Reports				
Type	Title	Citation	Date	Status
i.e. Peer-reviewed journal, conference paper, book, policy paper, magazine/newspaper article	Publication title	Full citation		i.e. Submitted, accepted, under review
N/A	N/A	N/A	N/A	N/A

Answer the following questions (N/A if there is nothing to report):

1. Did you deploy any technology during the reporting period through pilot or demonstration studies as a result of this work? If so, what was the technology? When was it deployed? N/A
2. Was any technology adopted by industry or transportation agencies as a result of this work? If so, what was the technology? When was it adopted? Who adopted the technology? N/A

3. Did findings from this research project result in changing industry or transportation agency practices, decision making, or policies? If so, what was the change? When was the change implemented? Who adopted the change? N/A
4. Were any licenses granted to industry as a result of findings from this work? If so, when? To whom was the license granted? N/A
5. Were any patent applications submitted as a result of findings from this research? If so, please provide a copy of the patent application with your report. N/A
6. Based on project results, were any industrial contracts awarded for additional research and development activities? If so, when? How much was awarded? Who awarded the contract? N/A

Describe any additional activities involving the dissemination of research results not listed above under the following headings:

Outputs:

Definition: Any new or improved process, practice, technology, software, training aid, or other tangible product resulting from research and development activities. They are used to improve the efficiency, effectiveness, and safety of transportation systems. List any outputs accomplished during this reporting period:

- N/A

Outcomes:

Definition: The application of outputs; any changes made to the transportation system, or its regulatory, legislative, or policy framework resulting from research and development activities. List any outcomes accomplished during this reporting period:

- N/A

Impacts:

Definition: The effects of the outcomes on the transportation system such as reduced fatalities, decreased capital or operating costs, community impacts, or environmental benefits. The reported impacts from UTCs are used for the assessment of each UTC and to make a case for Federal funding of research and education by demonstrating the impacts that UTC funding has had on technology and education. NOTE: The U.S. DOT uses this information to assess how the research and education programs (a) improve the operation and safety of the transportation system; (b) increase the body of knowledge and technologies; (c) enlarge the pool of people trained to develop knowledge and utilize technologies; and (d) improves the physical, institutional, and information resources that enable people to have access to training and new technologies. List any outcomes accomplished during this reporting period:

- Example: The developed sensing technology's successful deployment resulted in the adoption of the technology by the StateDOT. The technology will be installed in all new bridge installments of this type. This adoption will...

Participants and Collaborators:

Use the table below to list individuals (compensated or not) who have worked on the project other than students.

Table 5: Active Principal Investigators, faculty, administrators, and Management Team Members				
Individual Name & Title	Dates involved	Email Address	Department	Role in Research
Jonathan Rubin	rubinj@maine.edu	MCSPC	Principal Investigator	
Kathryn Ballingall	kathryn.ballingall@maine.edu	MCSPC	Co-PI	

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

Table 6: Student Participants during the reporting period								
Student Name	Start Date	End Date	Advisor	Email Address	Level	Major	Funding Source	Role in research
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Use the table below to list any students who worked on this project and graduated or received a certificate during this reporting period. Include information about the student's accepted employment (i.e. the student is now working at MaineDOT) or if they are continuing their students through an advanced degree (list the degree and where they are attending).

Table 7: Students who Graduated During the Reporting Period			
Student Name	Degree/Certificate Earned	Graduation/Certification Date	Did the student enter the transportation field or continue another degree at your university?
N/A	N/A	N/A	N/A

Use the table below to list any students that participated in Industrial Internships:

Table 8: Industrial Internships			
Student Name	Degree/Certificate Earned	Graduation/Certification Date	Did the student enter the transportation field or continue another degree at your university?
N/A	N/A	N/A	N/A

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

Table 9: Research Project Collaborators during the reporting period						
Organization	Location	Contribution to the Project				
		Financial Support	In-Kind Support	Facilities	Collaborative Research	Personnel Exchanges
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Use the table below to list **individuals** that have been involved as partners on this project and their contribution to the project. (List your **technical champion(s)** in this table. This also includes collaborations within the lead or partner universities who are not already listed as PIs; especially interdepartmental or interdisciplinary collaborations.)

Table 10: Other Collaborators				
Collaborator Name and Title	Contact Information	Organization and Department	Date(s) Involved	Contribution to Research
Dale Peabody		Director, Transportation Research, Maine DOT	10/2018-present	Technical Champion

Use the following table to list any transportation related course that were taught or led by researchers associated with this research project:

Table 11: Course List						
Course Code	Course Title	Level	University	Professor	Semester	# of Students
N/A						

Changes:

List any actual or anticipated problems or delays and actions or plans to resolve them (list no-cost extension requests here)

No-Cost Extension until 05/31/2022

List any changes in approach and the reasons for the change. Staff Capacity and COVID related delays.

Planned Activities:

List the activities planned during the next quarter.

- The team is continuing to meet with DOT to identify future research and collaborators that will increase knowledge and capacity for the use of connected vehicle technology and applications in the state of Maine and New England. A draft report of findings will be discussed with DOT, as well as future recommendations for investment in connected vehicle technology.