

Quarterly Progress Report:

Project Number and Title: 4-2 Future-Proof Transportation Infrastructure Through Proactive, Intelligent, and Public-involved Planning and Management

Research Area: Thrust 4 Connectivity for enhanced asset and performance management

PI: Jin Zhu, Ph.D. Assistant Professor, University of Connecticut

Reporting Period: Oct-Dec, 2019

Submission Date: December 31, 2019

Overview: (Please answer each question individually)

Provide **BRIEF** overview and summary of activities performed during the reporting period. This summary should be written in lay terms for a general audience to understand. This should not be an extensive write up of findings (those are to be included in the final report), but a high-level overview of the activities conducted during the last three months....

During the past three months, we focused on three major activities:

1. Finalize the outcome of Task 1 by generating written report and preparing for journal publication;
2. Start Task 2 by collecting data focusing on the impacts of coastal hazards on transportation infrastructure and corresponding strategies;
3. Explore the format and content of the decision-support system that can best benefit the end-users in the industry and DOTs

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

1. Activity 1 helps to disseminate the phased outcome of this research project and make broader impacts.
2. Activity 2 is the key for developing quantitative models that can realize predictive assessment and proactive management of transportation infrastructure under different uncertainties.
3. Activity 3 sets the foundation for future work in Task 3 and could affect the emphasis of modelling development in Task 2.

Describe any accomplishments achieved under the project goals...

1. A journal article draft on identifying future risks and opportunities in transportation infrastructure planning and management is under development
2. Literature review on assessment of the impacts of coastal hazards on transportation infrastructures

Complete the following tables to document the work toward each task and budget (add rows/remove rows as needed)...

Table 1: Task Progress			
Task Number	Start Date	End Date	Percent Complete
Task 1: Identify future risks and opportunities in transportation infrastructure durability planning and management.	October 1, 2018	September 30, 2019	100%
Task 2: Model the effects of future-proofing transportation durability planning and management strategies.	October 1, 2019	September 30, 2020	20%
Task 3: Develop a decision-support system for durability planning and management.	October 1, 2020	September 30, 2021	0%

Table 2: Budget Progress		
Entire Project Budget	Spend Amount	Spend Percentage to Date
\$241,250	\$67,806.90	28% (12/31/2019)

Describe any opportunities for training/professional development that have been provided...

1. The project has provided research training opportunity for 2 PhD students and 2 undergraduate students

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)
Emergence of Resilience from Network Dynamics in Civil Infrastructure Project Systems	University of South California – iLab Research Webinar	Webinar	Online	December 2, 2019
Future-proofing transportation infrastructure	NSF Research Coordination Network (RCN) on Sustainable Human-Building Ecosystem (SHBE) working group meeting	Working group meeting	Cleveland, Ohio	December 9, 2019

Table 4: Publications and Submitted Papers and Reports

Type	Title	Citation	Date	Status
Conference paper	A Conceptual Framework for Understanding the Relationships between Transportation Infrastructure and Human Resilience	Zhu, J., Zhang, L., Ren, Z. (2020). How Transportation Infrastructures Enable Human Resilience: Towards a Conceptual Framework. ASCE Construction Research Congress, March 8-10, 2020, Tempe, AZ.	March 8-10, 2020	Accepted
Peer-reviewed Journal	Defining Future-proofing Transportation Infrastructure Planning: A Topic Modeling Approach	TBD	TBD	Under preparation

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
Jin Zhu	jzhu@uconn.edu	Civil and Environmental Engineering	PI

Use the table below to list all students who have participated in the project.

Table 6: Student Participants during the reporting period				
Student Name	Email Address	Class	Major	Role in research
Sudipta Chowdhury		PhD	Transportation Engineering	Graduate research assistant
Ren Zheng		PhD	Transportation Engineering	Graduate research assistant
Xinyan Huang		Junior	Civil Engineering	Undergraduate research assistant
Salvatore Luzzi		Senior	Civil Engineering	Undergraduate research assistant

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
N/A			

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
Connecticut DOT	CT				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.

CTDOT has helped us with refining project scope and brainstorming the most useful end-products.

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.

Changes:

No significant changes have been made. After completing Task 1, we have more defined scope for the modelling we plan to build.

Planned Activities:

1. Finalize and submit the journal article under development
2. Continue data collection and computational model development
3. Establish more collaboration with industry and relevant stakeholders to get input and feedback