UTC Project Information – Project

Project Title	Damage Modeling, Monitoring, and Assessment of Bridge Scour and Water Borne Debris Effects for Enhanced Structural Life
University	University of Connecticut
Principal Investigator	Wei Zhang, Ph.D., P.E., Associate Professor, Department of Civil & Environmental Engineering, University of Connecticut
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Funding Source(s) and Amounts Provided (by each agency or organization)	Fast-Act (Federal-U.S. DOT): $200,000 (estimate) for 3 years; UConn (1:1 match): $200,000 (estimate) for 3 years
Total Project Cost	400,000 (estimate) (Federal plus 1:1 Match) for 3 years
Agency ID or Contract Number	
Start and End Dates	Oct. 01, 2020 to Sep. 30, 2023
Brief Description of Research Project	The objective of this project is to evaluate bridge failure risk due to bridge scour and waterborne debris impacts to enable predictive management for enhanced structural life. The proposed multi-disciplinary project will establish a systematic framework to apply analytical, computational, and experimental techniques to evaluate these effects on the future life of bridges. Possible damage mitigation methods will be evaluated.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	Our project is in the preliminary stage. We worked on a new risk based framework to quantify the debris generated from weather events for bridges. Tree conditions, river and flow conditions and precipitation information were included in the analysis to predict debris dimensions and sizes.
Impacts/Benefits of Implementation (actual, not anticipated)	
Web Links • Reports • Project website	PI Website: www.dm2l.uconn.edu Recent project related publications of interest: • Ma, X., **Zhang, W.** (2021). "Evaluating Tsunami Damage of Wood Residential Buildings in a Coastal Community Considering Waterborne Debris from Buildings", *Engineering Structures, Volume 244, 1 October 2021, 112761.* • Ma, X., **Zhang, W.** (2020) "Fatigue Life of Weldment Details of Existing Orthotropic Steel Bridge Considering the Scour Effects", *ASCE Journal of Bridge Engineering,* 25(10). October 2020. https://doi.org/10.1061/(ASCE)BE.1943-5592.0001612

- Anagnostou, E., & **Zhang, W.** (2017). Resiliency Analysis of Storm Surge for Interstate 95 Right-of-Way at Long Wharf / New Haven, CT. *Report Number: CT-2299-F-17-3.*
- **Malla, R. B**., Jacobs, D., Dhakal, S., and Baniya, S., "Dynamic Impact Factors on Existing Long-span Railroad Bridges," *Rail Safety Project – 25 Final Report,* Transportation Research Board, Washington D.C., Feb. 2017, 40 pages.
- Serhiyenko, V., Mamun, S. A., Ivan, J. N. and ***Ravishanker, N.*** (2016). Fast Bayesian Inference for Modeling Multivariate Crash Counts on Connecticut Limited Access Highways, *Analytic Methods in Accident Research*, 9, 44-53.
- Ray, B. K., Liu, Z., and ***Ravishanker, N.*** (2006). Dynamic Reliability Models for Software using Time-dependent Covariates. *Technometrics* 1, 1-10.