TIDC Transportation Infrastructure Durability Center AT THE UNIVERSITY OF MAINE

UTC Project Information	
Project Title	Condition Assessment of Corroded Prestressed Concrete Bridge Girders
University	University of Massachusetts Lowell
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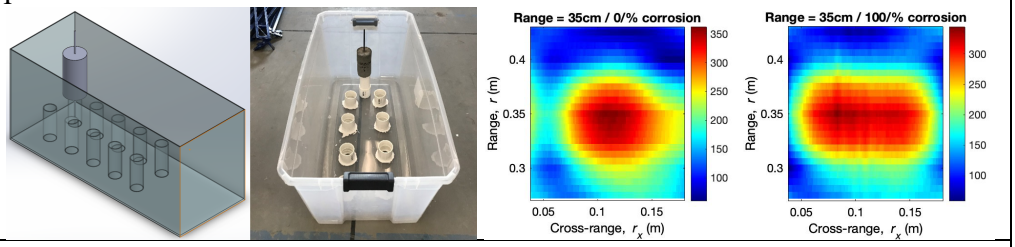
Funding Source(s) and Amounts Provided (by each agency or organization)	Fast-Act (Federal): $86,309, UMass Lowell & WNEU: $89,174 (match)
Total Project Cost	$175,483 (Year 1)
Agency ID or Contract Number	ORCID.org ID Number: 0000-0001-7532-3574
Start and End Dates	01/01/2019 ~ 09/30/2021
Brief Description of Research Project	The problem we are trying to solve is the condition assessment of corroded prestressed concrete (PC) bridge girders in New England. The problem is important because that PC bridge girders are a critical component of highway bridges. Concrete spalling and prestressing strand corrosion not only cause losses in prestress but also lead to premature failures of PC bridges. We propose to 1) conduct multiphysical field inspection (using 3D photogrammetry, radar, impact-echo, and ultrasound) and to 2) develop an integrated assessment framework for predicting the level of structural damage and prestress losses for PC bridge girders.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	We have developed a method to control the level of steel rebar corrosion inside reinforced concrete cylinder specimens in order to subject them to a pull-out test. 
Impacts/Benefits of Implementation (actual, not anticipated)	This project will enhance the transportation infrastructure durability as follows: • Efficient condition assessment algorithm – The chemical-mechanical model proposed by this research will provide a theoretical, but computationally efficient algorithm for assessing the remaining structural strength of PC bridge girders. • Data-driven decision-making – The vulnerability function for defining multiple damage states adopts the Bayesian framework, a data-driven method. The outcome can be customized improve the durability of PC bridges through effective structural repair.

Web Links • Reports • Project website	• We have submitted our quarterly progress report on September 30, 2021. • Updates of research activities are posted on our project website at https://www.uml.edu/Research/tidc/projects/assessment-corroded-prestressed-bridge-girders.aspx