ACCELERATED BRIDGE CONSTRUCTION
UNIVERSITY TRANSPORTATION CENTER

UTC Project Information	
Project Title	Simulation and Field Implementation of Autonomous Drone Based Vibration and Structural Health Monitoring of Bridges
University	UNR
Principal Investigator	Dr. Mohamed Moustafa
PI Contact Information	mmoustafa@unr.edu
Funding Source(s) and Amounts Provided (by each agency or organization)	$80,000(ABC-UTC) $40,000 (Matching Fund)
Total Project Cost	$120,000
Agency ID or Contract Number	69A3551747121
Start and End Dates	May 1, 2023 to May 31, 2024
Brief Description of Research Project	There has been increasing interest and use of unmanned aerial systems/vehicles (UASs/UAVs), especially in the past decade, for infrastructure inspection. The goal of this study is to build on our recent preliminary work at UNR towards simulation and field implementation of using UAVs or drones for vibration-based monitoring of bridges under service conditions or extreme events such as earthquakes. The project will use several technologies that have been established within our group on UAVs path planning algorithms and vision-based monitoring of bridges and infrastructure systems. Our objective is two-fold: (1) develop and establish a step-by-step simulation environment for testing drone-based bridge inspection methods for rapid assessment, and (2) use actual bridge case studies (either simple cases of on-campus pedestrian bridges or actual NV highway bridges under traffic loading) to implement fully- or semi-autonomous path planning algorithms for video monitoring of vibrating bridges. For implementation case studies, we will attempt to focus on both service load conditions as well as extreme events such as earthquakes using testbeds from upcoming shake table tests at the Earthquake Engineering Laboratory at the University of Nevada, Reno.

Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	The outcomes will be tracked and reported once they are identified.
Impacts/Benefits of Implementation (actual, not anticipated)	The impacts will be tracked and reported once they are identified.
Web Links • Reports • Project website	[Simulation and Field Implementation of Autonomous Drone Based Vibration and Structural Health Monitoring of Bridges | Accelerated Bridge Construction (fiu.edu)](#)