



ACCELERATED BRIDGE CONSTRUCTION
UNIVERSITY TRANSPORTATION CENTER

UTC Project Information	
Project Title	Principal and Considerations for Design of Small Unmanned Aerial Vehicles for Inspection and Survey
University	FIU
Principal Investigator	Mardanpour, Pezhman
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Funding Source(s) and Amounts Provided (by each agency or organization)	ABC-UTC Fund: \$52,608 Match Fund: \$26,304
Total Project Cost	Total Fund: \$78,912
Agency ID or Contract Number	Accelerated Bridge Construction University Transportation Center (ABC-UTC) DTRT13-G-UTC41; 69A3551747121
Start and End Dates	06/01/2017 – 04/30/2019
Brief Description of Research Project	<p>This study aims to identify the principal and considerations for the design of Small Unmanned Aerial Vehicles for inspection and survey processes. It provides a background of the current stage of the technologies and design parameters that should be taken into consideration for different aerial configurations. Additionally, a very robust design tool, Nonlinear Aeroelastic Trim and Stability of HALE (High Altitude Long Endurance) Aircraft (NATASHA) is customized to assess the aeroelastic stability and design of flexible fixed-wing that are beneficiary to survey and inspection maneuvers. Three aircraft configurations that are suitable for mapping and survey maneuvers have been designed with NATASHA. These designs are adjustable based on the payload requirement (camera, data acquisition system, etc.) and flight conditions. The computer program has been modified to take into account these parameters systematically and assess the stability of the aircraft. Moreover, an implementation demonstration of small rotorcraft drone for conceptual verification is performed for selective identified processes and applications. A model drone (rotorcraft) was used to carry out a different view of existing bridge segments in FIU Engineering Campus, which were part of the exit ramp of the Fort Lauderdale airport that was removed in 2013. As an exercise, the pilot flew the drone in the vicinity of the bridge segments and captured clear pictures of the damaged part of the bridge.</p>

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 <ul style="list-style-type: none">• Reports• Project website	https://abc-utc.fiu.edu/research-projects/fiu-research-projects/use-drones-abc/