## UTC Project Information

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| Project Title | EVALUATING DIGITAL TWIN TECHNOLOGY AND INTERNET-OF-THINGS SENSORS FOR INFORMED ASSET MANAGEMENT |
| University | University of Washington |
| Principal Investigator | Travis Thonstad |
| PI Contact Information | thonstat@uw.edu |
| Funding Source(s) and Amounts Provided (by each agency or organization) | ABC-UTC funds: $82,500<br>Match funds : $41,250 |
| Total Project Cost | $ 123,750 |
| Agency ID or Contract Number | 69A3552348322 |
| Start and End Dates | January 2, 2024 - December 31, 2025 |
| Brief Description of Research Project | As a transformative technology, "digital twins" have the potential to modernize and optimize bridge operation and maintenance, leading to improved asset management and bridge longevity. The value proposition for bridge owners is that in paying the upfront costs to build and maintain a digital twin of a physical asset, they can make better decisions and make better use of limited preservation funds. To realize these benefits, Internet-of-Things (IoT) sensors are used to monitor critical infrastructure components and are integrated with other data streams (e.g., traffic, weather, lidar surveys), as well as more conventional inspection activities (such as visual inspection or non-destructive evaluation) to enable a rich, digital representation and historical record of real-world conditions. This proof of technology project will provide near real-time, integrated data on the conditions of a floating bridge in Washington State that can be used to inform operational decisions about bridge closures, send alerts to operations and maintenance personnel when anomalies and issues are identified by the sensors, and a provide historical record of bridge performance correlated to traffic and weather conditions with which to base future asset management decisions. The fundamental research questions for this project are what savings could be realized for the technology investment and what are the potential benefits of using this technology in terms of operations and maintenance. Additionally, several workshops are planned on cloud-based digital twins software and operation of IoT sensors. Both technologies have significant potential application in a modernized asset management framework, and these trainings would support talent development in the next generation of digital tools. If successful, this project would provide a blueprint |

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| | for implementing this technology, at scale, to provide real-time monitoring data for modern transportation asset management. |
| 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<br>• Reports<br>• Project website | https://abc-utc.fiu.edu/research-projects/evaluating-digital-twintechnology-and-internet-of-things-sensors-for-informed-assetmanagement/ |