



ACCELERATED BRIDGE CONSTRUCTION
UNIVERSITY TRANSPORTATION CENTER

UTC Project Information	
Project Title	An Agent-based Decision Support Tool to Identify Near-Miss Incidents and Accessibility Issues in Accelerated Bridge Construction
University	University of Oklahoma
Principal Investigator	Dr. Arif Mohaimin Sadri
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Funding Source(s) and Amounts Provided (by each agency or organization)	\$65,000(ABC-UTC) \$32,500(Matching Fund)
Total Project Cost	\$97,500
Agency ID or Contract Number	69A3551747121
Start and End Dates	June 2023 to March 2024
Brief Description of Research Project	<p>Due to the unknowns and uncertainties associated with construction activities, the construction industry experiences a high frequency of accidents every year. Over the years, researchers have extended manifold efforts to address this issue. Recent literature in construction safety emphasizes new integrative techniques to integrate behavioral attributes of construction sites (such as workers, materials, equipment, among others) into the analysis of construction safety environments. However, most studies adopt very simplified approaches to replicate different hazard scenarios in construction sites that varies significantly for different construction activities. Moreover, these simplified techniques do not incorporate near-miss incidents and accessibility issues occurring frequently at construction sites. Accelerated Bridge Construction (ABC) employs precast bridge elements moved to the bridge location and installed in place. Although ABC improves the life cycle cost, reduce construction time, improves safety, and result in higher quality of elements, nevertheless many cast-in-place activities need to be undertaken. As such, despite the fact that ABC reduces many uncertainties associated with construction processes and performance during service life, ABC-related activities may associate with near-miss incidents and latent accessibility issues. The proposed research will utilize an agent-based analytical modeling approach to run behavioral experiments and identify near-miss incidents at an active ABC site. Essentially, it will establish relationships and interactions between ABC site components, environment, and other characteristics. A predictive analysis of</p>

	<p>near-miss events can support the decision-makers to adopt proactive construction safety measures for different ABC work-zones in terms of near-miss chances by examining the risk behavior of agents derived from behavioral experiments. The proposed research will provide new safety and accessibility perspectives related to ABC activities based on different critical near-miss scenarios. The results will be compiled and published on the ABC-UTC website and will become available to outside users and researchers. The project will also develop a decision support tool that different construction and/or transportation agencies can use to: (i) identify proactive safety measures; (ii) avoid future hazardous incidents; (iii) improve overall site safety monitoring; (iv) increase accessibility; and (v) identify differences in near-miss incidents between regular construction and ABC.</p>
<p>Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here</p>	<p>The outcomes will be tracked and reported once they are identified.</p>
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>The impacts will be tracked and reported once they are identified.</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project website 	<p>An Agent-based Decision Support Tool to Identify Near-Miss Incidents and Accessibility Issues in Accelerated Bridge Construction Accelerated Bridge Construction (fiu.edu)</p>