

**Project title:**

Intermodal Transportation Infrastructure Interactions: Utilizing Acoustic Emission and Other Non-destructive Evaluation Technologies

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**Project description:**

US has world's best and vast transportation infrastructure. Also it is aging fast. The U.S. Department of Transportation reported that in 2008, one in three urban bridges was structurally deficient. Safety of the transportation network strongly depends on the performance and safety of its highway bridges. Bridges, a vital part of the transportation infrastructure system, are vulnerable to extreme events such as natural disasters (e.g., hurricanes, earthquakes, floods, major storms, climate change), in addition to hazards stemming from negligence and improper maintenance, collisions (with vessels and vehicles), intentional acts of vandalism, and most importantly from the increased truck loads due to freight movement including the overweight freight trucks. These structures being vital for transportation safety and economics need the best protection. This requires timely but economical repair and maintenance. Due to the aging and deterioration of bridges, the evaluation of the existing conditions of their structural elements becomes vital to engineers and public officials when deciding upon how to repair or replace these structures. The ability to obtain necessary information on these conditions is often expensive and time consuming, especially in the case of concrete bridges where the reinforcement is not available for inspection. Further, the inspection methods and technologies need to be non-destructive, devoid of introducing any damages during the monitoring process.