Evaluation of the In-Service Performance of Bridge Decks Built with Fiber Reinforced Polymer (FRP) Composite System

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Objectives
Monitor the performance of bridge decks built with FRP materials over a three-year period. Evaluated parameters include:

- Control of Deflections in service
- Assessment of Stiffness Degradation
- Load Rating through Load Testing
- Load Factor Distribution between Panels.

Background
Deterioration of bridges has motivated the use of FRP technology in two aging bridges in the City of Saint James. In 2000, deteriorated concrete decks were replaced by decks built with FRP materials. Non Destructive Load Tests have been conducted over a period of three years to monitor their behavior.

Anticipated Benefits
Motivate and create confidence in the use of both technologies in the competitive standard of short-span bridge market.

Analytical Models
Comparison between Field Test Results and Analytical Models aid to understanding the behavior of the structure and ensure appropriate Load Rating of the bridge decks built with FRP materials.

Evaluation of Deflection-Load over Time
Field evaluation shows that the FRP bridge decks exhibit minimal stiffness degradation and same structural response under similar loading.

Walters St FRP-RC Bridge
Saint Francis St GFRP Honey Combo Panel Deck Bridge St James, MO

Data Acquisition System
LVDT - Strands

9-FRP RC Panels
4-GFRP Honey Combo Panels