

# Developing Notification and Enforcement Systems to Communicate and Administer Bridge Load Postings

## *Drafting a method of tracking bridge deterioration and alerting drivers of their potential hazards*

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20ITSLSU17

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Louisiana State University

**Funding Source(s):**

Tran-SET

Louisiana State University

**Total Project Cost:**

\$120,000

US State and local law enforcement agencies strive to enforce weight restrictions on heavy vehicles on public roads for public safety and to safeguard vital transportation infrastructure. For instance, vehicles over 40 tons are not permitted on interstate highways under normal conditions. Moreover, other restrictions can be applied based on the legal load combination, a function of vehicle weight and axle spacing. The Louisiana Department of Transportation and Development (LADOTD) has a total of 13,000 bridges: 8,000 on-system bridges (state-owned) and 5,000 off-system bridges (locally owned) which require considerable resources for upkeep. Generally, bridge owners have three main tasks in common:

- Inspect the bridge for deterioration or damage.
- Determine if changes in condition have reduced the bridge's structural capacity to safely carry legally permissible loads, measured by its load rating
- Notify the public and authorities of any weight restrictions.

Unfortunately, the bridges are deteriorating faster than rehabilitation and replacement can be implemented. As bridges age and live load increases due to industry demand for larger and more numerous trucks, the load carrying capacity of the structure decreases, therefore load posting is needed for public safety.

## Problem Statement

According to the National Bridge Inspection Standards, a bridge is inspected every two years as per the bridge owner's responsibility. This is to document any deterioration or damage that might reduce capacity. Accordingly, an updated load rating analysis might be needed. When the operating level rating factor of a bridge is less than 1 for a given legal load combination, the bridge can no longer carry that full legal load. As this puts the drivers' safety at risk, the bridge owner must restrict truck weights. This can be done through

a load posting, until structural capacity of the bridge is restored, or the bridge can no longer carry traffic.

## Objectives

The main objectives of this proposed project are:

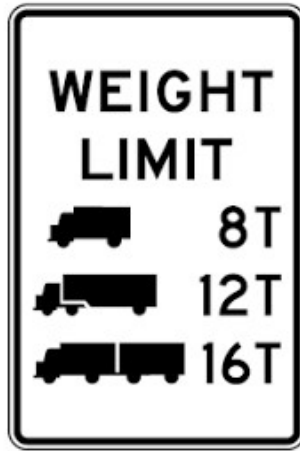
- Identify plausible notification methods that successfully communicate bridge load postings to motorists and traffic controllers.
- Explore and advise potential approaches to communicate potential detour routes.
- Establish corresponding enforcement methods required to administer bridge load postings.

## Intended Implementation of Research

**Education and Workforce Development:** This project will educate both students and researchers on the benefits of the proposed research. The project team will submit an implementation report documenting the activities and materials produced during the implementation phase.

**Outreach:** This research project will encourage the cooperation of undergraduate students in the research activities to guide them towards graduate studies at LSU. Thus, one undergraduate student from LSU will be recruited to assist with some facets of the project (such as performing the literature review and creating the survey forms).





**Figure 1: Bridge load posting**

### Anticipated Impacts/Benefits of Implementation

This research study will give insights about improving traffic safety in Louisiana by drafting a mechanism to communicate and enforce load restrictions on bridges. This is critical to maintain the appropriate level of safety for those driving over these bridges often.

The main deliverables from this study are: (1) a report documenting all collected data, methodology to achieve the project's objectives, results, conclusions, and recommendations; (2) spreadsheets of all datasets used in this project.

### Web links

- Tran-SET's website  
<https://transet.lsu.edu/research-in-progress/>

### Tran-SET

Tran-SET is Region 6's University Transportation Center. It is a collaborative partnership between 11 institutions (see below) across 5 states (AR, LA, NM, OK, and TX). Tran-SET is led by Louisiana State University. It was established in late November 2016 "to address the accelerated deterioration of transportation infrastructure through the development, evaluation, and implementation of cutting-edge technologies, novel materials, and innovative construction management processes".

### Learn More

For more information about Tran-SET, please visit [our website](#), LinkedIn, Twitter, Facebook, and YouTube pages. Also, please feel free to contact Mr. Momen Mousa (Tran-SET Program Manager) directly at [transet@lsu.edu](mailto:transet@lsu.edu).

