

## JUST THE FACTS

**Monitoring Load Distribution and Fatigue Cost Estimates of Heavy Truck Loads on Louisiana State Bridges****Start Date:**

April 1, 2009

**Duration:**

24 months

**End Date:**

April 1, 2011

**Funding:**

State: TT-REG

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walaywan@la.gov**PROBLEM**

Several LTRC funded studies have evaluated fatigue damage from heavy truck loads (GVW 100,000 lb.) on Louisiana Bridges.<sup>(1-4)</sup> The final reports for these studies recommended a field investigation to verify the theoretical studies. LTRC Final Report 418 entitled "Monitoring System to Determine the Impact of Sugarcane Truckloads on Non-Interstate Bridges" contains a partial list of bridges that are subject to overloaded sugarcane trucks (GVW 100,000 lb.). In this proposed study, the researcher will select one of the bridges listed in LTRC Final Report 418, design, and install a monitoring system to verify the results predicted in the report and recommend an implementation measure.

**OBJECTIVES**

The objective of this research is to develop an integrated system for monitoring live load and to verify the carrying capacity of highway bridges in Louisiana where heavy truck loads may have caused significant damage.

**METHODOLOGY**

A monitoring system will be developed. The system will provide synchronous measurement of live load and structural response of bridge components. The system will integrate a distributed network of advanced strain and displacement sensors (continuous and peak). The anticipated major contributions will include accumulated fatigue load spectra, strain measurements to determine in-service

**SPECIAL POINTS OF INTEREST:**

- Problem Addressed
- Objectives of Research
- Methodology Used
- Implementation Potential



Figure 1

Typical 3S3 Interstate truck on Louisiana highways

conditions, and assess adverse loading . The range of bridge parameters under investigation will be used so they adequately cover the range of non-interstate highway bridges traveled by heavy truck loads. The variation of forces and moments in bridge girders as a function of heavy truck loads will be studied, and a bridge monitoring systems will be developed to measure in-service conditions and to assess adverse loading conditions.

### **IMPLEMENTATION**

This research will deliver a field-verified model for analyzing and determining the cost of fatigue damage to bridges due to heavy truck loads. The results of the proposed research will be implemented in Louisiana and could be extended to other states. The outcome of this research is also predicted to reduce the construction and maintenance cost of bridges.

<sup>(1)</sup> Report No. 321 (Preliminary Assessment of Pavement Damage Due to Heavier Loads on Louisiana Highways)

<sup>(2)</sup> Report No. 398 (Effects of Hauling Timber, Lignite Coal, and Coke Fuel on Louisiana Highways and Bridges)

<sup>(3)</sup> Report No. 418 (Monitoring System to Determine the Impact of Sugarcane Truckloads on Non-Interstate Bridges)

<sup>(4)</sup> Report No. 425 (Evaluating the Effects of Heavy Sugarcane Truck Operations on Repair Cost of Low Volume Highways)

These reports are available online at [http://www.ltrc.lsu.edu/pubs\\_final\\_reports.html](http://www.ltrc.lsu.edu/pubs_final_reports.html).

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