RESEARCH
PROJECT CAPSULE [16-2P]
October 2016
TECHNOLOGY TRANSFER PROGRAM

Transportation Infrastructure Asset Damage Cost Recovery Correlated with Shale Oil/Gas Recovery Operations in Louisiana

JUST THE FACTS:

Start Date:
August 1, 2016

Duration:
24 months

End Date:
July 31, 2018

Funding:
SPR: TT-Fed/TT-Reg

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Sponsored jointly by the Louisiana Department of Transportation and Development and Louisiana State University

POINTS OF INTEREST:

Problem Addressed / Objective of Research / Methodology Used Implementation Potential

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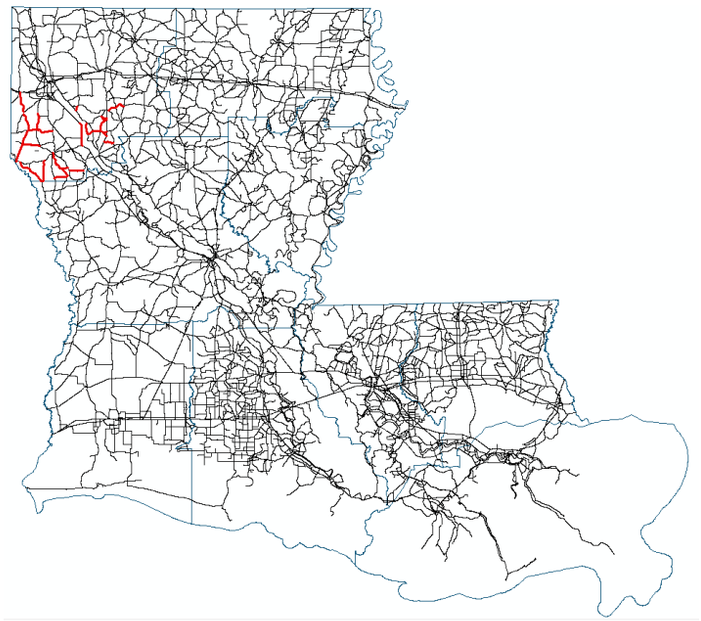
PROBLEM

Due to shale oil/gas recovery operations, a large number of truck trips on Louisiana roadways are required for transporting equipment and materials to and from the recovery sites. As a result, roads and bridges that were designed for agricultural purposes and/or residential access are now subjected to heavy traffic loads that are far beyond the original design limits of the infrastructure. Roadway damages in northwest Louisiana due to oil/gas recovery activities have been increasing drastically. The Louisiana Department of Transportation and Development (DOTD) needs to assess and quantify the damages prior to seeking recovery of costs for repair. There is no existing approach available for Louisiana to estimate and recover costs for repair of the associated roadway damages.



Damaged roads in the Haynesville shale geologic region (in red)

OBJECTIVE

The objectives of this study are to quantify the pavement damage caused by shale oil/gas recovery activities; to estimate the costs of the pavement damage and recommend a strategy of fiscal remedies; and to forecast the impact of future shale oil/gas well development activities on Louisiana roadways and validate the recommended strategy of fiscal remedies.

METHODOLOGY

Based on a comprehensive review of literature regarding the impact of energy development on roadways, the research team will collect information about shale oil/gas operations and any past studies that evaluated the impact of those operations on roadways.

The coordinate locations for shale gas wells and injection wells were obtained from the Louisiana Department of Natural Resources. The wells have been categorized by year. Data regarding associated overweight permits for past years will be retrieved for future reference.

DOTD has identified a set of roadways that may have been damaged by shale oil/gas recovery activity. For this study, knowledge of the total trips generated per well is important when assigning truck trips to these identified roads.

Also for this study, the impact of hauling water on the roadways is considered negligible. It is anticipated that the transportation of fresh water to recovery sites will occur by pipelines from nearby surface water bodies or from a groundwater well, and the disposal of salt water will occur at an injection site. The primary purpose of trips on the roadways is for hauling of equipment and supplies.

A damaged section of LA 169

A traffic planning procedure for distributing and assigning traffic will be utilized. To quantify the roadway damages caused by the shale oil/gas recovery activities, a pavement analysis using both the AASHTO 1993 design method and the Pavement ME design method will be performed. Similarly, the estimated impact of future shale oil/gas operations will be predicted.

Two scenarios will be considered: determination of distresses due to design traffic and determination of distresses due to design traffic plus extra traffic generated from the oil/gas activities. The difference between the determined distresses will be indicative of the damages caused by the oil/gas operations. The damage cost will be subsequently analyzed, and a strategy of fiscal remedies will be proposed based on the cost analysis.

IMPLEMENTATION POTENTIAL

Based on this study, DOTD will have a quantitative estimation of the roadway damages due to shale oil/gas recovery activities. Recommendations provided from this study will help to establish a strategy for fiscal remedies and potential recovery of costs for repair of associated roadway damages.