



Project Summary

Texas Department of Transportation

0-6498: Texas Energy Developments and TxDOT Right of Way

Background

In recent years, Texas has experienced a boom in energy-related activities, particularly in wind power generation and extraction of oil and natural gas. While energy developments contribute to enhance the state's ability to produce energy reliably, many short-term and long-term impacts on the state's transportation infrastructure are unknown. TxDOT has begun to document impacts of energy-related activities on transportation infrastructure through a variety of initiatives. However, a comprehensive document that describes impacts, needs, and strategies is missing. The purpose of the research was to measure the impact of increased level of energy-related activities on the TxDOT right-of-way and infrastructure, as well as develop recommendations to reduce and manage TxDOT's exposure and risk resulting from those activities.

What the Researchers Did

The researchers completed the following activities:

- Developed file geodatabases of relevant energy and transportation-related datasets.
- Conducted and documented field visits to develop a more thorough understanding of potential impacts and issues resulting from energy developments.
- Evaluated pavement impacts, roadside impacts, operational and safety impacts, and economic impacts resulting from energy developments in the state.
- Prepared a set of strategies and recommendations for implementation.

What They Found

The researchers developed file geodatabases of relevant energy and transportation-related datasets. The documentation included a detailed description of steps, scripts, and other procedures used, which would be needed to help develop and maintain the geodatabases during implementation. The researchers also generated a wide range of queries, reports, and maps.

The field visits enabled the researchers to develop a more thorough understanding of potential impacts and issues resulting from energy developments. They visited a sample of corridors and locations at the Lubbock, Abilene, and Fort Worth Districts. The researchers also collected ground penetrating radar (GPR) and falling weight deflectometer (FWD) data at those districts. Considering the increasing level of activity in connection with the Eagle Ford Formation in South Texas, the researchers also met with officials from the Laredo, San Antonio, and Yoakum Districts.

Research Performed by:

Texas Transportation Institute (TTI),
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The evaluation of impacts of energy developments on the transportation infrastructure covered pavement impacts, roadside impacts, operational and safety impacts, and economic impacts. The pavement impact analysis included a high-level analysis of Pavement Management Information System (PMIS) data that involved a comparison between the corridors visited in the field and other (control) corridors, as well as a more detailed analysis of pavement characteristics and anticipated pavement remaining life. The roadside analysis focused on the impact of energy developments on the state highway right-of-way, more specifically in the following areas: accommodation of energy-related facilities on the state right-of-way, access to the state right-of-way from adjacent areas undergoing energy-related activities, and management of mineral rights within the state right-of-way. The operational and safety analysis focused on the impact of energy-related developments on roadway operations and safety, more specifically on crash rates and vehicle enforcement data. The economic impact analysis included a documentation of funding and expenditure levels at TxDOT, a review of maintenance expenditures along sample corridors, and the development of a methodology to assess economic impacts resulting from specific energy developments.

What This Means

The researchers prepared a set of recommendations for implementation that included changes to business practices and procedures, as well as short-term initiatives to facilitate the implementation of the research findings. The recommendations were grouped into the following categories: early notification and coordination (five recommendations), road maintenance and repair (four recommendations), roadside management (two recommendations), and funding (six recommendations). Critical recommendations included the need to maintain the geodatabase of energy developments to help TxDOT forecast and manage future developments, the need to engage and coordinate with energy developers earlier in the process, and the need to strengthen certain protocols and requirements (e.g., those dealing with triaxial design checks, cross sectional elements on rural two-lane highways, and driveway permits).

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