



Caltrans Division of Research,
Innovation and System Information

Research

Notes

Planning
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Project Title:
Energy Development and
Transportation Systems

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Task Manager:
Patrick Tyner
Associate Transportation Planner
patrick_tyner@dot.ca.gov

State Responses to Energy Sector Developments Transportation Pooled Fund-5 (327)

Addressing impacts to state transportation infrastructure due to the expansion of energy development

WHAT IS THE NEED?

New and expanding energy sector developments – oil, natural gas, coal, wind, biofuels, and solar – are occurring in numerous states throughout the country. Hydraulic fracturing (fracking) for crude oil and natural gas is expanding in many states, including California. Extracting the sand used in the fracking process is underway in states. Increased shipments of crude oil by rail and barges are occurring in these states, including California. Supply chains serving energy installations in one state often originate in another state, as is often the case with California.

While states, counties, and communities are realizing economic benefits from these activities, the impacts from energy development on transportation systems are immediate and extensive. Rural roads and bridges are especially vulnerable to the increased volumes of trucks, but additional demands are also being placed on the rail, port, and aviation networks. State departments of transportation and other agencies are responding in numerous ways to increased truck traffic, infrastructure deterioration, and safety concerns.

The influence of energy sector development on the transportation system is being examined by numerous states, the Transportation Research Board (TRB), and other organizations. Examples of TRB activities include workshops and sessions at Annual Meetings, a policy session at the 2013 Executive Committee Summer meeting, and a May 2014 Workshop in Arlington, Texas. In addition, a National Cooperative Highway Research Program (NCHRP) Synthesis on the topic is being finalized. Further, the recent ASCE Shale Energy Engineering Conference (SEEC) included numerous papers and presentations on topics related to the energy sector's impact on the transportation system.



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California's transportation system

WHAT ARE WE DOING?

Survey, Interview, and Site Visit Representatives from State Departments of Transportation. This task will include developing, posting, and analyzing an online survey, conducting telephone interviews, and conducting state site visits (by the research team, including Katie Turnbull at the Texas Transportation Institute – TTI) to obtain information from state departments of transportation and other transportation agencies on the methods, tools, and techniques being used to address energy sector development impacts on the transportation system. Information on research projects underway in the various states will also be obtained. The task will expand on the work conducted under NCHRP Synthesis 45-10, The Impacts of Energy Developments on U.S. Roads and Bridges, research conducted for TxDOT, and research undertaken by TTI's Transportation Policy Research Center. Information will be obtained on the type and extent of impacts. Information will also be solicited on promising practices for responding to energy impacts, which includes industry engagement, infrastructure management, safety, funding and financing, planning and forecasting tools, and other topics. The results will be summarized in a PowerPoint presentation and a report.

Workshop and Member State Meeting. A workshop and meeting will be held for member states to exchange information on the challenges and opportunities associated with energy sector developments and to hear from experts on the topic. The workshop and meeting, which is anticipated to be held approximately 5-to-6 months into the project, will be organized with input from the member states. It is anticipated that the workshop may be held in conjunction with another conference or meeting organized by AASHTO or TRB to facilitate participation. Information obtained from the online survey and follow-up telephone calls will be presented and member states will share additional information and discuss issues and approaches. Funding for travel and expenses for two (2) representatives from member states will be provided. Member state participants will also have the opportunity to identify and discuss research needs and technology transfer activities, which may form the scope of work for additional years of the TPF or projects funded by other sponsors. A workshop and meeting summary will be prepared documenting the key topics discussed, possible follow-up research, and other future activities.

State-of-the-Practice Synthesis and Initiate Identified Research. The final product from the interviews, workshop, and meeting will be a state-of-the-practice synthesis. This synthesis will include best practice examples on the issues identified previously, including forecasting methods for new energy developments and impact areas, rapid response techniques for addressing infrastructure damage, funding and financing mechanisms, addressing safety concerns, and other topics. In addition, problem statements will be prepared on these and other topics for NCHRP, AASHTO, and other funding sources. Based on agreement from member states and funding availability, specific research projects may be initiated during the course of the year. Possible research topics may address methods for forecasting new energy developments and impact locations, rapid response techniques to infrastructure damage, improved asset management techniques, financing methods, and addressing safety concerns.

WHAT IS OUR GOAL?

The goal of this study is to provide communication and information sharing among member states related to proactive and reactive responses to energy sector developments, including industry engagement, infrastructure management, funding and financing, safety, planning and forecasting tools, and other related topics.

WHAT IS THE BENEFIT?

While Caltrans participates in various freight studies and planning activities, specific information about energy sector development impacts to the State are not completely known. In California, there are more than 160,000 oil wells in production with more being planned. These oil wells often require truck services over rural and urban routes to drill and maintain them. Materials such as sand, pipe, and chemicals are often trucked to oil well drill pads and facilities. After wells are initially drilled, it takes thousands of gallons of water to maintain for as long as one year. All of that water is trucked to these sites. This study will provide Caltrans initial, in depth knowledge of energy sector logistics practices, specifically the oil industry, and create greater awareness of energy sector impacts to California's transportation infrastructure.



WHAT IS THE PROGRESS TO DATE?

While the project start date is shown as December 1, 2014 (per the original solicitation announcement), Caltrans' direct involvement with the study began in the March/April 2015 timeframe with DRISI discussions with the lead agency (TXDOT) regarding the timing of Caltrans' funding contribution and our ability to participate. The Division of Transportation Planning's (DOTP's) Freight Planning Branch is the Caltrans internal customer for this work. A project "kickoff" meeting was held for participating state representatives on July 15th. We are currently working with the project's researchers on securing a site visit location in California: The visit to occur in October 2015. The identified end date for this study (November 30, 2015) will likely be pushed out to early 2016.