2015 Educational Series

Energy Sector

Texas Department of Transportation

Transportation in the Energy Sector

OVERVIEW

The development of energy resources significantly contributes to the economies of individual communities and the state as a whole. It provides employment for thousands of Texans across the state and is a vital source of often scarce jobs in economically disadvantaged areas. It helps to generate sales and hotel tax revenue for many local governments and provides severance taxes and other revenue for the state. While the energy sector provides a positive economic impact, the development of energy resources significantly affects our transportation infrastructure and challenges the efforts of The Texas Department of Transportation (TxDOT) and local governments to ensure the safety of the traveling public and to protect the taxpayers' investment in our state's highways, roads and bridges.

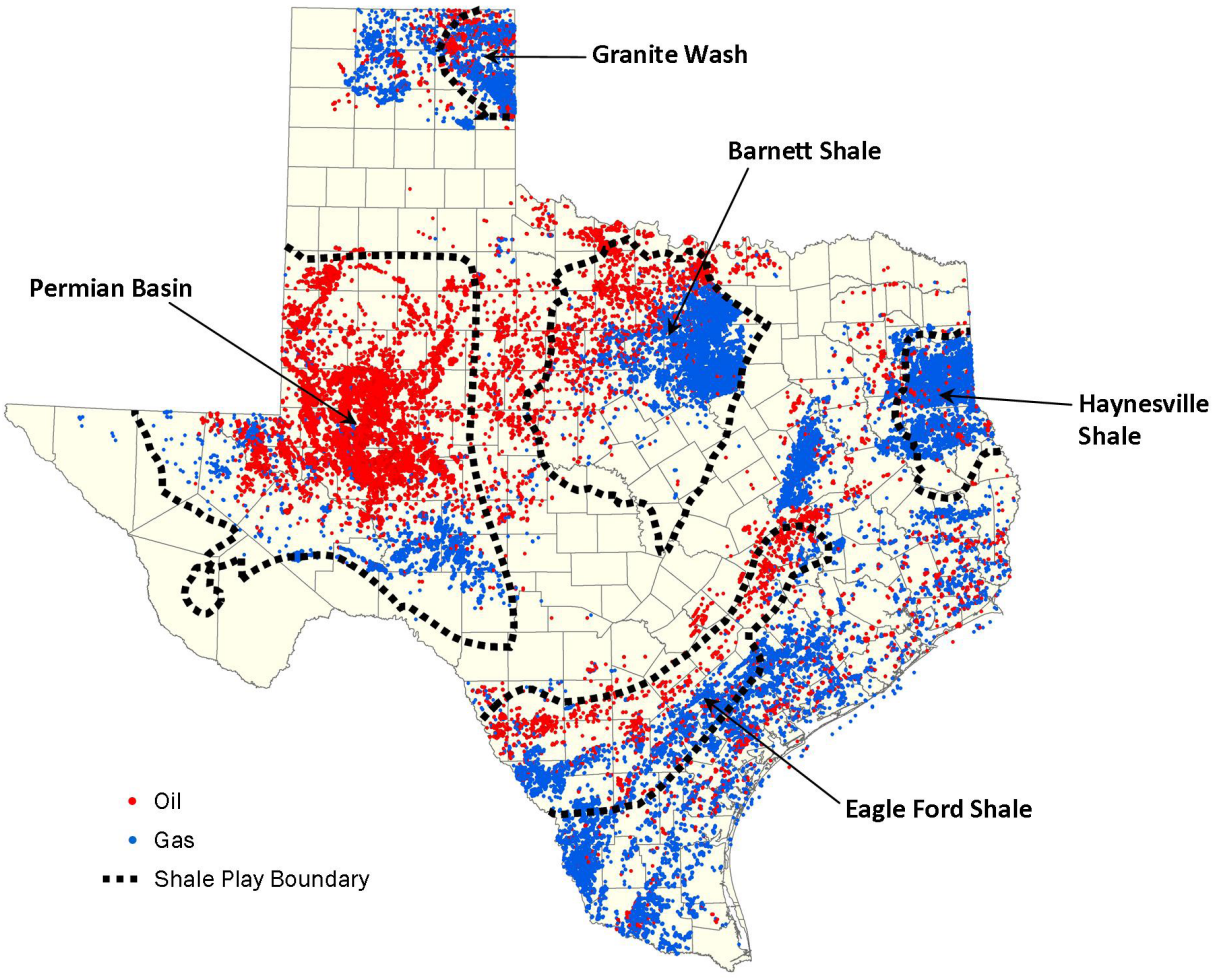
ENERGY DEVELOPMENT ACTIVITIES STATEWIDE

Energy development activities have been underway for decades in Texas. The map below shows the extent of oil and gas drilling activities around the state and provides some sense of the corresponding challenge to TxDOT and local governments responsible for maintaining transportation infrastructure.

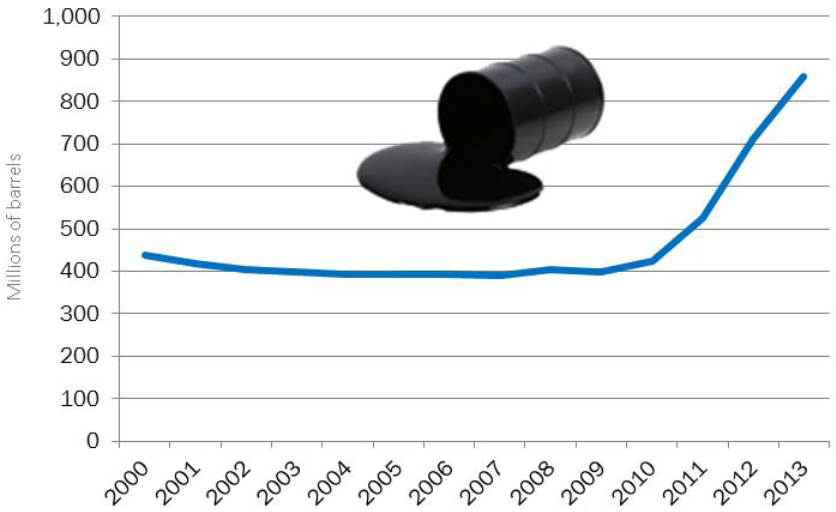
CHALLENGES FOR TxDOT AND LOCAL GOVERNMENTS

While Texas' energy resources include oil, natural gas, coal, wind, solar, biofuels and nuclear, the production of energy from oil, natural gas and wind has caused the greatest impact on our transportation infrastructure. A great deal of the exploration and production associated with the latter forms of energy occurs in rural areas where most of the roads and bridges were designed for lower volumes

Texas Oil & Gas Well Permits (2005-2010) and Major Shale Plays



Barrels of Oil Produced in Texas, 2000-2013



Source: Texas Railroad Commission

of traffic. Production of oil, gas and wind energy, however, requires large numbers of heavy trucks, including many classified as oversize and/or overweight vehicles. Over time, large volumes of heavy truck traffic can damage roads and bridges and significantly reduce their service life. The problem is particularly acute on highways, roads and bridges that are not designed or constructed to accommodate heavy loads or oversized vehicles.

Damaged roads and bridges are more than a major inconvenience for energy companies and a logistical and financial burden for state and local governments. More importantly, they are also a safety hazard for motorists. In some cases, severely damaged roads can impede or prevent access by school buses and emergency vehicles. Rougher roads also impact trucking industries through increased vehicle maintenance and burning more fuel from slower operating speeds and traffic delays. Given the extent of energy development activities around the state, damage to transportation infrastructure is not limited to one route or area. These areas have experienced a sudden explosion of drilling activity, which prevented the department and local governments from gradually ramping up their maintenance and repair efforts.

The need to maintain and repair highways, roads and bridges affected by energy development activities imposes a financial burden on TxDOT at a time when the department already faces funding challenges. Those challenges include motor fuels tax revenue that is disproportionate to the need, diversion of some of that revenue for other purposes and uncertainties about the amount and duration of federal transportation and the ability to retain qualified maintenance personnel while competing with energy sector employment needs.

Additionally, damaged roads are a problem that many cash-strapped counties cannot afford to address with current tax revenues. In an era when rebuilding a paved road can cost more than $1 million per mile, the annual maintenance and construction budget for many rural county road and bridge departments is likely no more than $1 million to $2 million in total.

Energy-Related Impacts on Highways and Roads

Energy development activities have an extremely significant impact on our state's transportation infrastructure. Much of the impact stems from the

Oil and gas-related trucks in the Eagle Ford Shale region

Steps to Drilling and Fracking an Oil Well

Drilling Process
(Approximately 25 Days)

- Prepare pad site
- Mobilize rig
- Install closed-loop mud system
- Erect drilling rig
- Perform drilling operations
- Remove rig upon completion of drilling

Hydraulic Fracturing Process

- Transport three to four million gallons of water and hundreds of tons of proppants and chemicals
- Inject water and proppants into well
- Dispose of waste water

large number of heavy truck trips required to bring an oil or gas well into production or to erect a wind turbine.

The volume of truck traffic required to bring a single gas well into production is equivalent to the impact of approximately eight million cars. Truck traffic required to maintain a single gas well's production is equivalent to up to an additional two million cars per year.

The transportation of water used in the hydraulic fracturing process also has an impact on our infrastructure. In addition to its inherent weight, water transported in a truck sloshes back and forth in the truck tank, which constantly shifts the weight borne by each axle and causes far greater road damage than a load of the same weight that consists of a static material. Moreover, water used in hydraulic fracturing must be transported twice: the first time to the well prior to use and a second time to a disposal well.

Increasing Use of the Rural State Highway System

The state's Farm-to-Market and Ranch-to-Market (FM/RM) road network, which represents only 14 percent of the state highway system, has traditionally been used for local rural needs. However, the bulk of new energy activity is occurring in areas accessed by these roads. Since the FM/RM system was not designed to accommodate the amount, size and weight of traffic associated with oilfield operations, the energy boom poses a challenge to rural infrastructure.

From 2009 to 2013, truck traffic on the rural FM/RM network increased substantially. Measured in daily vehicle miles travelled (DVMT), truck traffic volume increased by 15.4 percent during this period. This compares to a smaller 5.7 percent increase on the state's other on-system rural highways and a 6.2 percent increase on the overall state highway system.

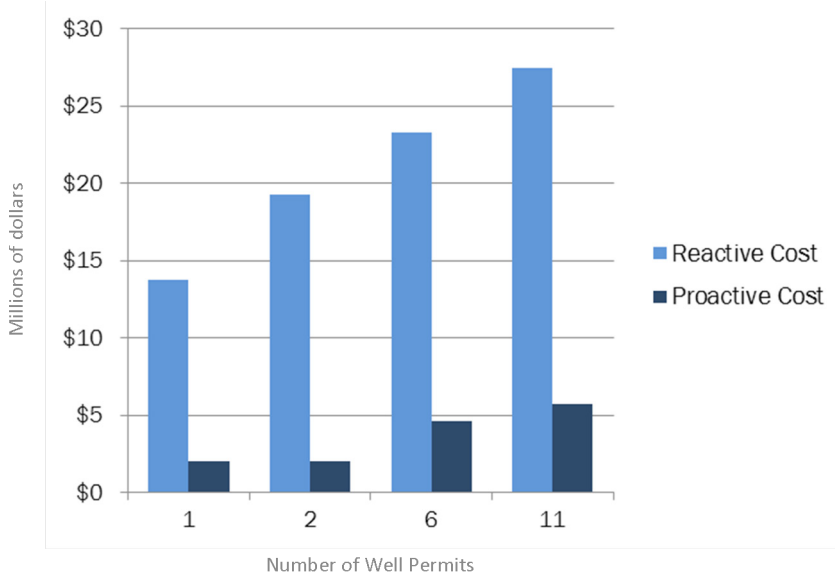
Overall Cost of Energy Sector Activity

Under a contract with TxDOT, the Texas A&M Transportation Institute (TTI) studied the financial impact of the current oil and gas production boom on the state's highways and local road networks. TTI concluded that the statewide annual cost of maintenance and repair needs on the state highway system associated with energy sector activity would be a minimum of $1 billion each year or $2 billion per biennium.

TTI's research quantified the cost for rebuilding infrastructure being consumed by increased energy-related activities at a minimum of approximately $1 billion annually for roadways under TxDOT's jurisdiction and approximately $1 billion annually for roadways under the jurisdiction of local governments. TTI's research also determined that reinforcing or "armoring" roadways and bridges in advance of the energy-related traffic increases would substantially reduce costs.

Reactive vs. Proactive Maintenance Costs over 20 Years

Sample Segment: 12.6 Miles of FM 2688 in Dimmit County



The Texas Transportation Commission has not altered traditional funding formulas to increase allocations to districts affected by energy sector activities. Rather, the Commission has directed some statewide discretionary funds to the impact areas and TxDOT has also used other funds specifically designated by legislative authorization for targeted energy sector projects. Any other increase in funding to TxDOT districts affected by energy sector activities has only occurred indirectly because of accelerated pavement and bridge deterioration and the weight of these variables in the existing funding formulas. TxDOT has used funds designated by legislative authorization for targeted energy sector projects (HB 1025 $225 million; SB 1747 $225 Million).


Road edge damage

State Highway System Cost of Energy Sector Activity

The following information pertains solely to roadways on the state highway system.

Current Damage: Current data indicates that at least 7,492 miles of the state highway system in areas where energy-sector activities have or are occurring, have been directly affected by those activities and are currently rated below TxDOT's minimum standard for pavement in "good" condition.

Forecasted Damage: Pavement scores reflect a significant decline in the portion of the state's FM/RM road network that supports energy sector activities, where pavement condition scores have fallen at a rate of five percent per year.


Road edge damange

Increased traffic and loads due to energy sector activities on arterials and freeways (e.g., Interstate highways, U.S. highways and state highways) are reducing the life expectancy of those roadways. If these arterials and freeways were represented in quantities similar to FM/RM roadways, TxDOT projects that approximately 6,080 miles will be adversely affected by energy sector activity.

TxDOT also estimates that approximately 3,000 miles of the potential 6,080 miles will require some immediate mitigation and/or armoring of damage resulting from energy sector activity. TTI estimated that between 7,900 and 22,000 lane miles on the state network will require mitigation based on influence zones.

RECENT LEGISLATIVE ACTIONS

2013's Supplemental Appropriations Bill, House Bill 1025 (83rd Legislature, Regular Session), specifically appropriated $225 million to TxDOT to repair or rehabilitate parts of the state highway system located in counties where there has been increased energy-related activity. The bill also


Oil and gas drilling rig

appropriated $225 million to TxDOT to distribute as grants to counties around the state to repair or rehabilitate county roads damaged by energy-related activities.

Supplemental Appropriations House Bill 1025 (State Highways)

HB 1025 required TxDOT to allocate its $225 million appropriation based on four criteria: safety, roadway condition, roadway width and traffic volumes. Using these criteria, TxDOT ranked proposed projects and selected 41 projects for development and funding. In July 2013, the Commission approved a minute order of the maintenance projects list of $225 million to fund 37 of the 41 projects. It funded the remaining four projects through regular appropriations.

Senate Bill 1747 (County Roads)

Senate Bill 1747 (83rd Legislature, R.S., 2013), established TxDOT's County Transportation Infrastructure Fund Grant Program and authorized the department to distribute $224.5 million among eligible counties that applied for funding. (The bill also provided that TxDOT could be reimbursed up to $500,000 for documented administrative costs associated with implementing the program.) The bill included an allocation formula based on energy-related activities in individual counties.

TxDOT began the implementation process shortly after the bill was enacted by creating both internal and external stakeholder groups. The internal group met frequently in order to ensure an all-inclusive, big-picture approach. TxDOT's Design Division was designated as the office of primary responsibility. The Office of Compliance, Ethics and Investigations, the Office of General Counsel and the Government Affairs Office were included in the discussions to advise on implementation.

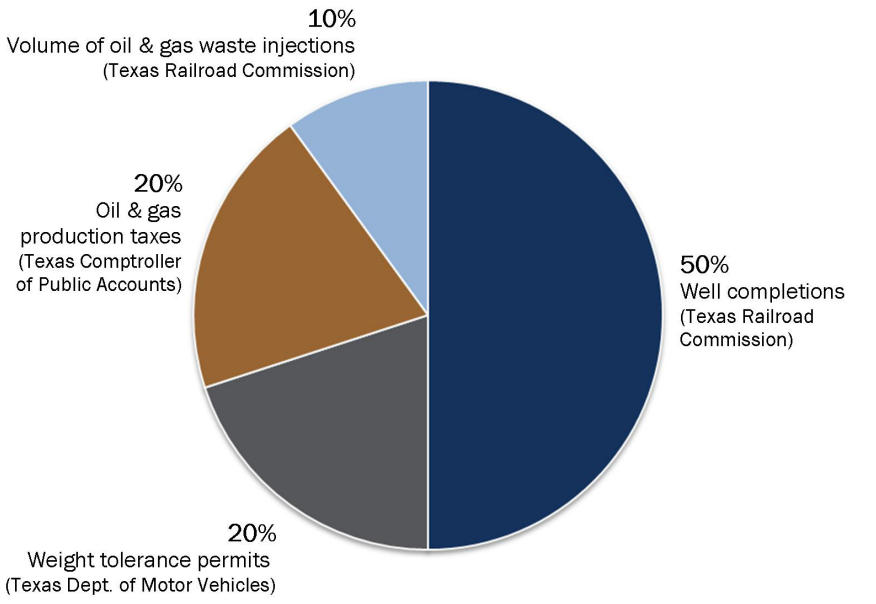
The external stakeholder group consisted of representatives from:

- County Judges and Commissioners Association of Texas
- Texas Association of Counties
- Texas Conference of Urban Counties
- Texas Comptroller of Public Accounts
- Texas Department of Motor Vehicles (DMV)
- Texas Railroad Commission (RRC)
- Staff from senator and representative offices

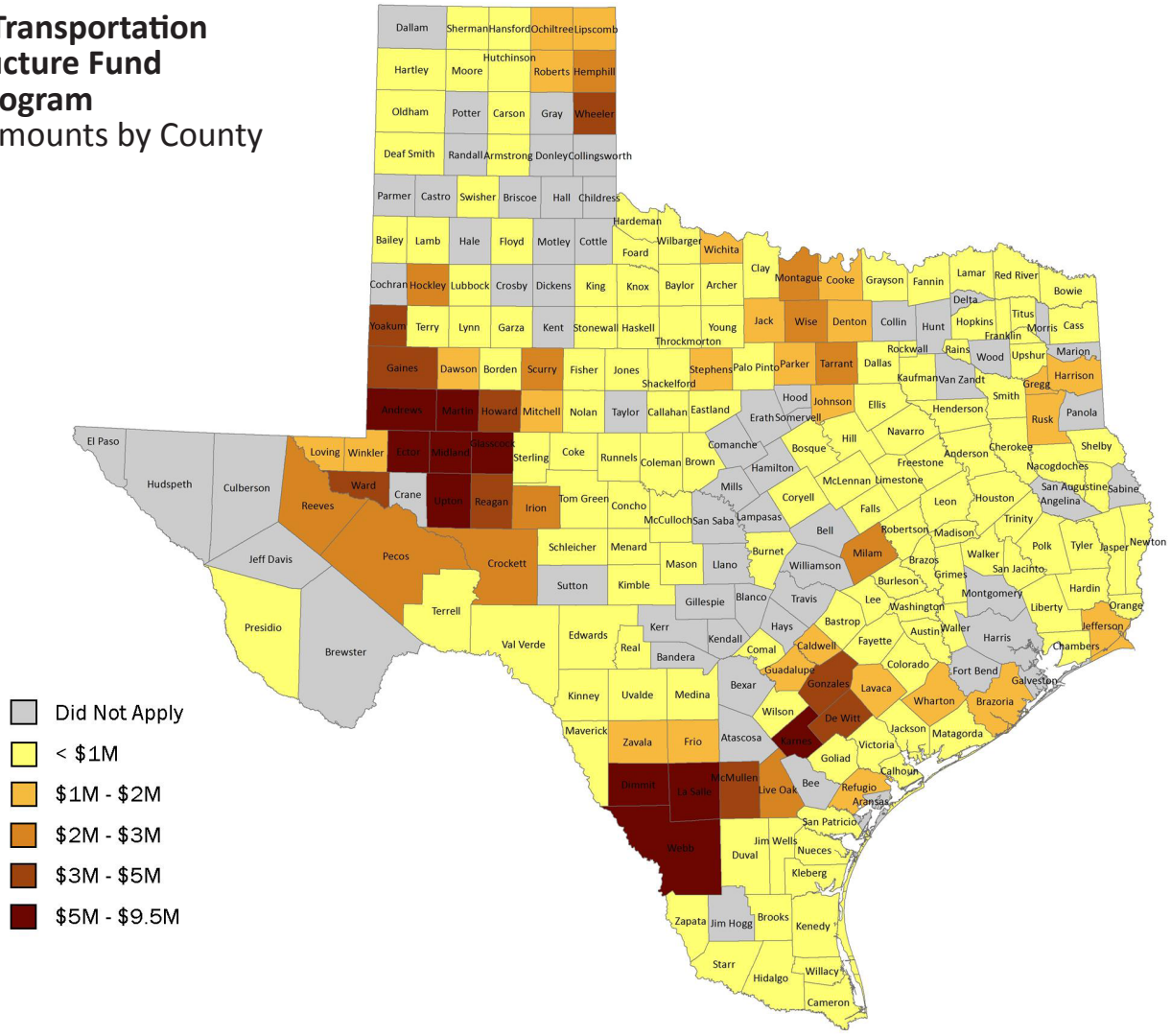
The bill outlines the grant distribution formula and requires grants to be distributed among the counties using the following formula:

- 20 percent according to weight tolerance permits, as determined by the DMV
- 20 percent according to oil and gas

County Transportation Infrastructure Fund Grant Program Distribution Formula



County Transportation Infrastructure Fund Grant Program
Award Amounts by County



production taxes, as determined by the Comptroller
- 50 percent according to well completions, as determined by the RRC
- 10 percent according to the volume of oil and gas waste injected, as determined by the RRC

In order to be eligible to receive a grant under the program, the bill requires a county to provide matching funds, from any source, in an amount equal to at least 20 percent of the amount of the grant. A county that is determined to be economically disadvantaged must provide matching funds in an amount equal to at least 10 percent of the amount of the grant.

Transportation Code, §222.053(a), defines an "economically disadvantaged county" as a county that has, in comparison to other counties in the state:

- Below average per capita taxable property value;
- Below average per capita income; and
- Above average unemployment.

Transportation Code, §222.053(f), requires the Commission to certify a county as economically disadvantaged on an annual basis as soon as possible after the Comptroller provides reports on the economic indicators listed above. The list of Economically Disadvantaged Counties was adopted by the Commission, in September 2013.

Funding Distribution

After a public comment period, the Commission adopted final administrative rules governing the County Transportation Infrastructure Fund Grant Program. At the same meeting, the Commission issued a call for projects under the new program.

Pursuant to the allocation formula in the legislation, all 254 counties were eligible to receive funds and TxDOT received applications from 191 counties. The Commission awarded grants to those counties in early April 2014. This timeline allowed participating counties to establish a County Energy Transportation Reinvestment Zone (CETRZ), prepare all necessary documents, establish an advisory

board, and identify the required matching funds.

Once the department finalized application review and calculated eligible grant awards for all eligible applicant counties, a post-award agreement was established to assist the counties and TxDOT in achieving full compliance while keeping project development and administration activities at reasonable levels of effort. The department determined voucher procedures for reimbursement and continues to maintain documentation of projects. Each TxDOT district has a point-of-contact for the counties involved in the grant program, and TxDOT's Local Government Project Office serves as a resource to district personnel in ensuring compliance with the program requirements. TxDOT's district offices around the state are currently working with counties in their jurisdictions that received program grants to expedite construction of county roadway projects funded through the grants.

Portable dynamic message sign warns drivers

Communications

To ensure transparency throughout the implementation process, TxDOT maintained two websites dedicated to the implementation of the bill: www.txdot.gov/government/funding/county-fund.html and www.roadsfortexasenergy.com. These websites provide information on the bill, correspondence between TxDOT, the Commission, agencies, and county and local officials. It serves as a resource for counties to provide data sets, proposed and adopted rules, a list of economically disadvantaged counties, a County Energy Transportation Reinvestment Zone (CETRZ) guide, minimum allocations per county, and timeline for TxDOT and Commission action.

Additionally, TxDOT staff made numerous presentations at conferences and meetings statewide including several County Judges' and Commissioners' Conferences, Rural Planning Organizations, Texas Association of Counties, the Association of Rural Communities in Texas, and numerous others around the state. These meetings allowed for open communication and information sharing.

The websites also highlighted the department's "Be Safe Drive Smart" campaign, which promotes safety messages in response to increased traffic fatalities and injuries in energy production areas. TxDOT worked in partnership with oil and gas associations, the Texas Department of Public Safety, and communities across the state to increase the safety of our roadways by communicating safety messages to those in energy production areas.

TEXAS DEPARTMENT OF TRANSPORTATION

MISSION STATEMENT

Work with others to provide safe and reliable transportation solutions for Texas.

GOALS

- **Maintain a safe system**
- **Address congestion**
- **Connect Texas communities**
- **Become best-in-class state agency**

VALUES

- **Trust**
- **Integrity**
- **Responsibility**
- **Excellence**
- **Service**

This document is part of an educational series on transportation issues
produced by the Texas Department of Transportation.