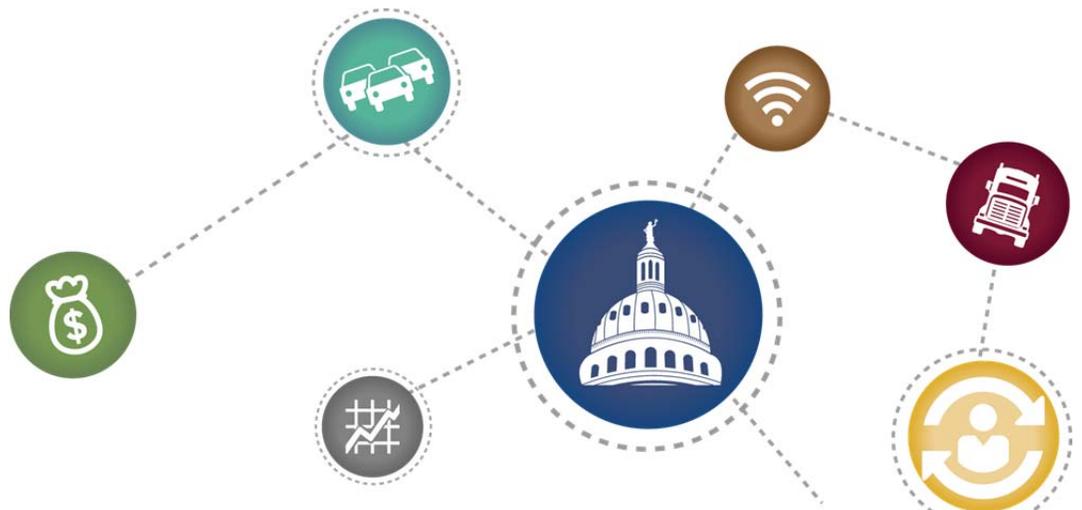


Energy Development Impacts on State Roadways: A Review of DOT Policies, Programs and Practices across Eight States *Final Report*

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Energy Development Impacts on State Roadways: A Review of DOT Policies, Programs and Practices across Eight States

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Executive Summary

Background and Significance

The Policy Research Center (PRC) at the Texas A&M Transportation Institute (TTI) has identified and reviewed policies, programs, and practices used by departments of transportation (DOTs) in eight states for dealing with the impacts of intensive energy development on their roadway systems. This review is timely and relevant to transportation infrastructure planning and funding needs in Texas.

Technological advances in crude oil and natural gas exploration through the combination of horizontal drilling and hydraulic fracturing (“fracking”), as well as development of large-scale wind energy farms and other technologies, have resulted in explosive growth in domestic energy development activity. Provided the energy market maintains sufficient pricing to support exploration and development, this activity is expected to continue for years, if not decades. While this development growth is resulting in substantial private and public economic benefits, it is also having significant impacts on state and local transportation systems.

Truck traffic volumes can be especially intensive during oil and gas fracking operations because hundreds or thousands of trucks are used to transport freshwater, sand, and chemicals to the wells in only a few days’ time, and then transport wastewater from them.

The objective of this project was to gain first-hand perspectives from state DOT officials about the ways that intensive energy development has impacted state roadways, what is and is not being done to address those impacts, and the outcomes of policies and programs on states’ ability to deal with these challenges. This project covered eight states—Colorado, Kansas, North Dakota, Oklahoma, Pennsylvania, Utah, West Virginia, and Wyoming—and included a policy and literature review of energy development revenue and transportation funding programs, and over 40 interviews with DOT officials in these states. While these are not the only states with energy development activity, they have experienced substantial recent growth in intensiveness of crude oil extraction, natural gas production wells, and/or utility-grade wind turbine developments. These states represent a range of geographic locations, histories, infrastructures, resources, populations, and philosophies.

Major Outcomes: Impacts on State Roadway Infrastructure

States with very intensive energy development often experience similar transportation impacts, which stem primarily from traffic increases, especially traffic from heavy trucks. Truck traffic volumes can be especially intensive during oil and gas fracking operations because hundreds or thousands of trucks are used to transport freshwater, sand, and chemicals to the wells in only a few days’ time, and then transport wastewater from them. Other activities include moving massive drilling rig components and construction equipment. Wind energy also has



Oil and gas production in some states has increased dramatically, causing damage to many roadways that were not built to accommodate high volumes of heavy truck traffic.

transportation impacts, but DOT officials reported these to be much less intensive and more short-lived than for oil and gas well drilling, fracking, and resource extraction.

While some oversize and/or overweight (OS/OW) trucks may have permits to operate in that condition, those that are not permitted can be especially problematic and challenging to address and enforce. The sheer numbers of trucks along with permitted and unpermitted OS/OW truck traffic can result in substantial road damage. In addition to heavy trucks, oil field/service company light-duty trucks and personal vehicles also contribute to higher traffic volumes.

Increased traffic volumes affect all types of roads but especially rural roads and bridges that experience the most severe impacts first. Many of these were not designed and engineered for heavy traffic but instead were built up and maintained over decades when traffic levels were low. These roads often lack sufficient base

and pavement structures to withstand the heavy and repeated loadings of large trucks. DOT officials cited cases of such roads being virtually pulverized over a few days. These types of roads also generally lack sufficient widths to accommodate wider vehicles and increased traffic volumes, quickly damaging the edges of roads and right of way (drainage and signs), which in turn can accelerate road degradation or cause safety issues. Local (e.g., city, township, county) infrastructures are often affected as much as or more than state-maintained infrastructures.

Damage to roads and bridges can quickly result in lower levels of service (poor condition or total destruction), unsafe driving conditions, and an increase in both short- and long-term costs for pavement maintenance, rehabilitation, or reconstruction. Increased traffic volumes can also negatively impact public safety and convenience, and the environment. Roads with limited right of way and narrow widths lack capacity to support higher traffic levels, causing severe congestion and straining driver patience, which can lead to aggressive or unsafe driving behaviors and increased accidents.

Major Outcomes: State DOT Policies and Programs

Several state DOTs have implemented policies and programs—formal, strategic initiatives—that help them address the impacts of energy development traffic on roads and bridges.

Posted Weight Limits

One frequently used policy is the use of posted road vehicle weight or load restrictions, where allowable weights on roads and bridges can be drastically reduced to 10 tons or less per vehicle. This policy is especially used in states where roads are subject to freeze-thaw cycles.

Bonding and Maintenance Agreements

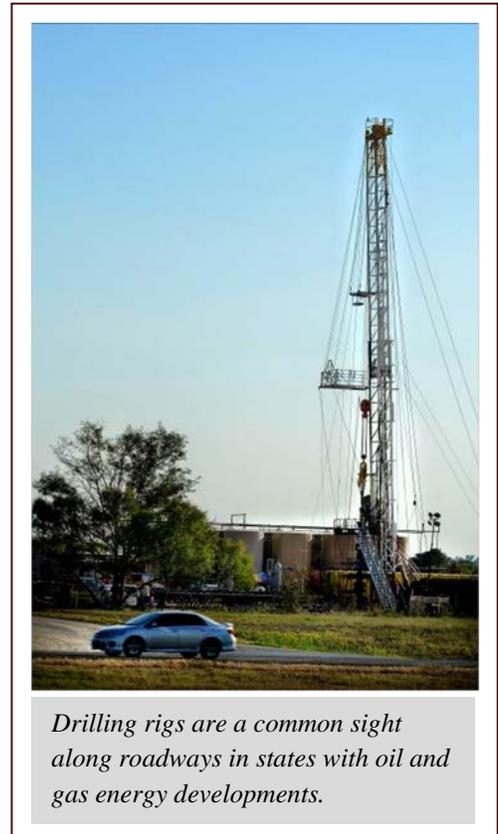
Pennsylvania and West Virginia have bonding and road use maintenance agreement programs for their state roads, which place financial and roadway condition maintenance responsibility on industry roadway users. DOT officials and other sources suggest that as a result, industry has covered tens to hundreds of millions of dollars in roadway maintenance and upgrades to rural roadways in these states. DOT officials also noted that while this can be effective for lower-level (smaller/rural) roadways, it is difficult to implement on higher-level roads due to the difficulty of identifying specific users. Other DOT representatives indicated that their agencies do not use bonding on state roads, but the practice is sometimes used by local jurisdictions. Some of these states are also starting to develop road use maintenance agreements with industries in select districts, although the practice appears to be ad hoc and inconsistent statewide.

Active Industry Engagement

Pennsylvania has a very active industry engagement program, most formally through the Governor's Marcellus Shale Advisory Commission and regular meetings by state DOT officials with the Marcellus Shale Coalition, an industry trade group. Pennsylvania DOT officials describe these meetings and relationships as being highly effective in enhancing their ability to anticipate roadway needs and work with industry to address roadway problems. The absence of such programs in most other states appears to indicate limited formal DOT mechanisms and structures for communicating with the petroleum industry, solving problems, and planning for future developments.

Capital Improvement Programs

Pennsylvania and North Dakota have recently had significant increases to transportation funding. This has enabled their DOTs to improve roadway infrastructures in energy-impacted areas as well as statewide, particularly through capital improvement programs. Other states in which transportation funding has not significantly increased reported limited ability to improve



Drilling rigs are a common sight along roadways in states with oil and gas energy developments.

roadway infrastructure; in some districts they are not able to keep up with energy development impacts. DOT officials in nearly all states cited stagnant maintenance funding, which inhibits their ability to keep current infrastructure at serviceable levels. Eventually, more costly rehabilitation and reconstruction are needed to restore serviceability.

Major Outcomes: State DOT Practices

DOT practices are less formalized than policies or programs and often have greater variation from district to district within a state. These include methods, materials, and technologies used for infrastructure management, although in general, greater funding allows for more robust, long-term solutions. Many of the practices used are not unique to energy-sector impacts, although some state DOTs and their districts are adapting standard practices to problems that are specific to energy development, which they have learned through their own experiences and those of other states.

Collaboration with other state agencies, particularly state energy and environmental regulators, helps some DOTs plug information gaps regarding current and future energy developments and potential traffic impacts.

TTI researchers found that while short-term DOT planning practices are similar from state to state, long-term planning practices vary. Accurate truck traffic information is very important for both short-term and long-term DOT planning, but it is difficult for some DOT districts to obtain accurate, recent information due to the nomadic nature of energy development, centralized control of traffic-monitoring functions within DOTs, and the time delay between official traffic counts. Some DOT districts are collecting their own traffic data and ‘ground-truthing’ information provided by centralized traffic data collection systems.

DOTs in Colorado, North Dakota, Pennsylvania, and Utah reported engaging in long-term energy corridor planning involving important roads or other modes such as pipelines and rail. Collaboration with other state agencies, particularly state energy and environmental regulators, helps some DOTs plug information gaps regarding current and future energy developments and potential traffic impacts.

Among the states reviewed in this project, the combinations of policies, programs, and practices for dealing with the roadway impacts of energy development range between being more proactive and being more reactive. Proactive states have increased transportation funding levels, enacted legislation, and/or developed policies and programs that enhance the ability of their DOTs and other agencies to work effectively with the energy industry to solve problems, plan for and implement strategic infrastructure investments, and preserve existing transportation systems. Reactive states lack these elements. DOTs in these states reported insufficient resources to keep

up with energy industry impacts to road and bridge systems, ad hoc responses to infrastructure preservation needs, and little or no direct communications with the energy industry.

Major Outcomes: State DOT Constraints

There were also consistent constraints that DOT officials discussed that limit their abilities to deal with energy development impacts on state roadways. Several constraints were found across the eight states that were included in the study, regardless of their state’s proactive/reactive response to energy development impacts. First, there are drastically different development timeframes between public sector transportation and private energy sectors. DOT interviewees frequently indicated that obtaining information months or years in advance of energy developments—which would greatly enhance their ability to plan for and implement roadway preservation measures and strengthen roads before they are impacted—is practically impossible under current regulatory and reporting frameworks and the highly competitive, rapidly changing, and frantic-paced nature of petroleum energy developments. When the energy sector moves into a new area, the impacts on infrastructure are extremely rapid; years of damage can occur in a few weeks, whereas even short-term DOT maintenance planning cycles are on the order of two to four years in length.

With a few exceptions for road bonding/maintenance agreements as noted previously, most state DOTs have limited direct authority over various oil and gas energy sector players, which may be numerous even for a single well. Planning for ancillary (e.g., pipeline) petroleum or wind developments and communicating with these entities are less problematic. This is interpreted as being due to the nature of these industries’ activities—their impacts on and use of transportation infrastructure require DOT permits, whereas for oil and gas well activities, this is much less so.

When the energy sector moves into a new area, the impacts on infrastructure are extremely rapid; years of damage can occur in a few weeks.

DOT challenges with limited financial resources were noted above. Roadway maintenance funding is often tied to fuel taxes and registration fees, which remain stagnant, and buying power decreases over time. In addition, while many states have severance or resource taxes and fees on energy development, the amounts that are reinvested from such sources for transportation preservation/development and transportation safety

programs are often limited and compete with other applications. DOT officials also noted very high inflation in energy development-intensive areas. Even in locations where increased funding has been allocated for transportation infrastructure, costs increase and availability decreases for critical materials, equipment, and personnel.

Major Outcomes: Roles and Needs of DOTs

DOT officials in multiple states commented about their roles in balancing the protection of public infrastructure and accommodating and facilitating business development. They recognize the substantial economic benefits that energy development industries provide, but frequently lack the means to ensure that the general public and private business interests have roadway infrastructures that are adequately constructed and maintained. The primary needs of DOTs to address the roadway impacts of intensive energy development are resources for preserving and upgrading infrastructure, mechanisms for engaging with industry, and information and tools. These needs are closely linked.

Resources for Preserving and Upgrading Infrastructure

Resources can come in a variety of formats. Obvious funding sources are legislative appropriations and/or industry bonding and maintenance agreements, yet these may not cover all costs. DOTs also recognize that even if enough funding were available, immediately addressing every single need may not be the best option. Time and personnel are other critical resources. DOTs need to be able to catch up—through hiring or contracting additional help, getting a break in the pace of development, or both. Qualified personnel are important, but wage structures for public employees often fail to compete with those of energy-sector positions, limiting the pool of employees and increasing turnover.

Mechanisms for Engaging with Industry

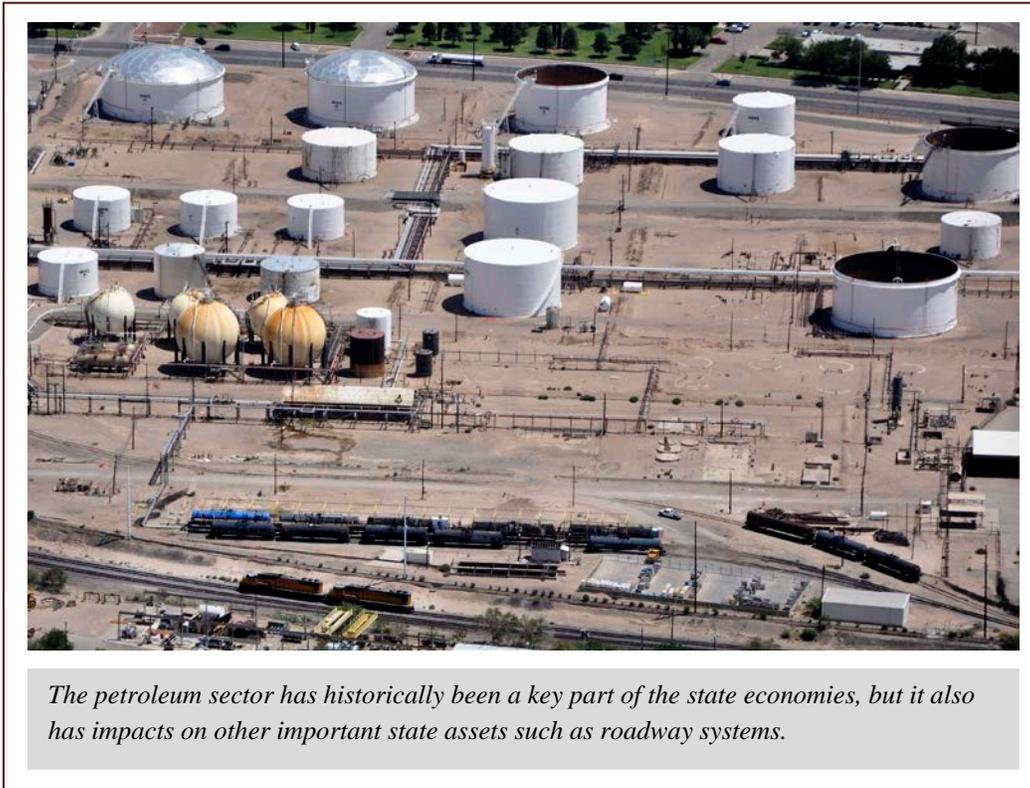
Many of the DOTs indicated a need to engage with the energy sector. Their primary motivations for doing so are working together with the energy industry to solve problems and learning about development practices and plans. Engagement between industry and the public sector can be facilitated through both formal and informal mechanisms and structures. Communication needs to be open, honest, frequent, and promoted and participated in at the highest levels. Engagement can be obtained through collaborative relationships with industry or through regulatory frameworks. It may be directly between DOTs and industry, indirectly via other state agencies, or both.

DOT officials in multiple states commented about their roles in balancing the protection of public infrastructure and accommodating and facilitating business development.

Information and Tools

Information about energy developments can help DOTs better plan for protecting public infrastructure, safety, and the environment, and for facilitating economic growth. Using information also requires tools for planning and forecasting growth, predicting infrastructure impacts and needs, and evaluating and selecting alternatives. Such needs are not only at the state level; local communities are especially hard hit by energy development impacts. Local needs mentioned by DOT officials include effective planning processes to protect communities and

structure growth and development, and local technical assistance programs (LTAPs), which engage transportation experts at state agencies with transportation officials in local communities.



Major Outcomes: Policy Considerations

Each of the states in this study has different combinations of policies, programs, and practices they use for addressing the impacts of intensive energy development on infrastructures such as public roadways. This study did not evaluate the effectiveness of state DOTs' abilities to respond to energy development impacts either through qualitative feedback from DOT officials or a quantitative assessment of the effectiveness of specific measures on roadway quality or preservation. These evaluations could provide valuable information about the practical merits of various DOT policies, programs, and practices, and are important next steps.

The interviews indicate that certain states are using proactive measures that enhance their communications with energy development industries, utilize available funding, or plan strategically for long-term infrastructure preservation and construction. These factors contribute to the abilities of state DOTs to deal with the impacts of energy development on their roadway systems. State DOTs that were not using such measures were more reactive and were limited in their abilities to deal with the impacts of energy development on their roadway systems.

The experiences of DOTs in other states that are cited in this report can provide useful information for Texas as it considers how to address its own challenges presented by energy

development activities. Policy and research questions were identified in areas of collaboration, communication, and infrastructure management at state levels, as well as local impacts.

Collaboration and Communication

- How can state agencies work together to share information and plan strategically to balance economic development with infrastructure, safety, and environmental impacts?
- Should there be a formal, high-level mechanism for bringing the private and public sectors together to address Texas' energy development and transportation needs or is this best handled through informal, ad-hoc processes?
- What are the rules of engagement, expectations, and obligations for collaboration and communication?

Infrastructure Management

- What are the expected outcomes of continuation of the status quo for transportation planning, funding, and infrastructure management practices?
- If there is to be increased funding for addressing the impacts of energy development on transportation, what are the appropriate sources and levels of funding? Where is funding applied, and how is it managed?
- What are the roles, if any, for the private sector in maintenance of impacted public infrastructure, or addressing congestion and the driver behavior issues associated with energy industry traffic?
- What personnel, materials, and other resources are required for state agencies? Which agencies should be involved?
- What innovative forecasting tools are available to help predict energy development activities and their associated effects on transport systems?
- How does the state balance tradeoffs between the planning horizons of private industry and public sectors?

Local Impacts

- What are the financial, management, and environmental impacts on local transportation systems, and how are they similar to or different from impacts on state systems?
- What is the role of state government in meeting local needs, whether through funding programs or local technical assistance programs?

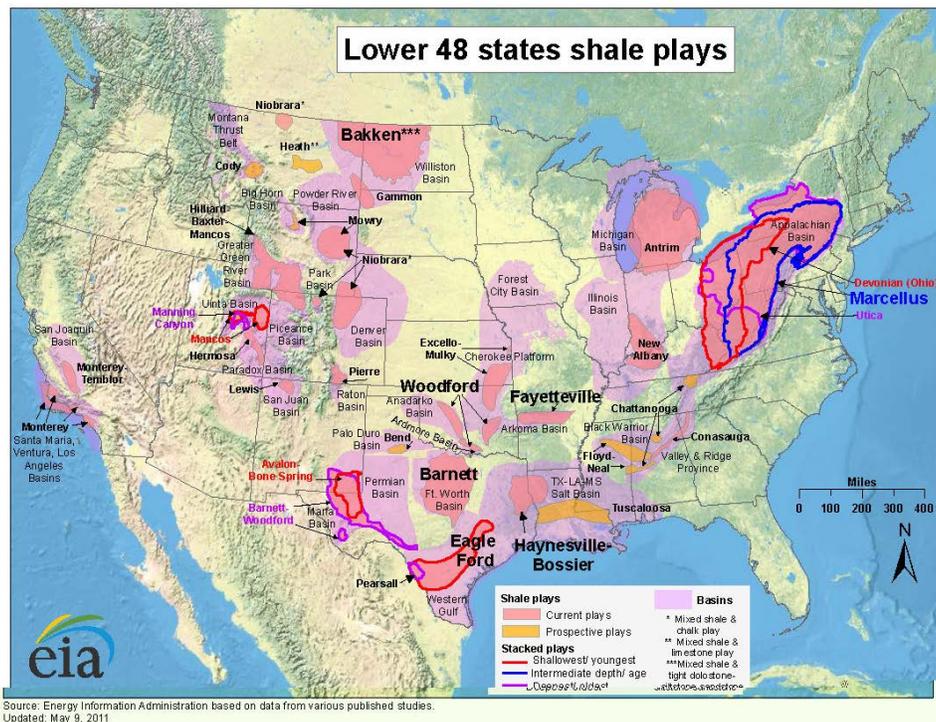
- Are there differences and policy/funding implications between urban and rural populations concerning energy development and its impacts on the state's transportation system and overall economy?
- How does overall transportation planning affect community development, growth, and sustainability?
- What are the legal frameworks and authorities available to local jurisdictions, other promising practices, or additional needs?

It is not easy to harness the benefits and address the costs of energy development at the same time. Policies that work in one state may not work in another. Alternatives that appear most viable at the state level may not necessarily be the best options at the local level or for the private sector. A systematic approach to balancing the economic, social, and environmental benefits and costs of energy development requires careful consideration and evaluation.

Section 1: Overview

Project Objective

Texas has experienced dramatic increases in oil and gas energy development activity in recent years, as well as wind energy development. With continued discoveries in different geologic formations, energy development is forecasted to continue for decades, provided the price of energy resources makes exploration and extraction economically feasible. While this has in many respects created a recent financial boom for energy companies, individual landowners, local governments, and the state, the heavy-truck traffic associated with energy development has also resulted in challenges to maintaining state and local roads, ensuring the safety of the driving public, and protecting the environment. In addition to Texas, other states have also experienced major energy development increases in recent years. Figure 1 illustrates the locations of major oil and gas energy shale plays across the lower 48 U.S. states.



Source: U.S. Energy Information Administration.

Figure 1. Map of Oil and Gas Shale Plays in the Lower 48 States.

While energy development affects numerous stakeholders, this report focuses on the policies, programs, and practices used by DOTs in other states for addressing the impacts of energy development on state roadways and associated policy considerations. This report covers eight states that, in addition to Texas, experienced extensive activity in oil, gas, and/or wind energy development in the previous seven years: Colorado, Kansas, North Dakota, Oklahoma, Pennsylvania, Utah, West Virginia, and Wyoming.

Information Sources

Online policy, programmatic literature, and media articles were the primary sources of information for this report about energy development, energy revenue and distributions, transportation revenue and distributions, and transportation funding. The primary sources of information about state DOT policies, programs, and practices for addressing impacts of energy development on state roadways were telephone interviews with more than 40 DOT representatives. Table 1 lists the DOT functions of participating project interviewees for each state.

Table 1. Functions of State DOT Interviewees.

State	DOT Function			
	Headquarters/Statewide Office		District/Region Offices	
	Construction Design/Engineering Maintenance Traffic/Operations Technical Assistance	Budget/Finance Environmental Freight/Multimodal Legislative/Policy Planning/Research Safety/Enforcement	Administrator Director Executive District Engineer	Construction Maintenance Operations
CO	0	1	1	1
KS	2	1	2	0
ND	2	0	1	0
OK	1	2	0	6
PA	1	0	3	2
UT	1	2	2	1
WV	1	1	0	1
WY	1	2	1	2
Total	9	9	10	13

Report Organization

The report is organized as follows:

- Section 2 presents a background on each state as context, including the intensiveness of energy development activity, methods and levels of public cost recovery (e.g., severance and production taxes), and methods and levels of transportation cost recovery and financing.
- Section 3 reviews the impacts of energy development on public road infrastructures, focusing particularly on state-maintained roads.
- Section 4 covers policies and programs used by states and state DOTs for addressing the impacts of energy development on state-maintained roads.

- Section 5 discusses other practices used by state DOTs for dealing with energy development impacts.
- Section 6 describes constraints on state DOTs that affect their ability to manage energy development impacts.
- Section 7 describes needs of state DOTs and policy considerations for Texas.

Sections 3 through 6 summarize key points and topics but also include transcriptions from interviews in the participants' words (edited to smooth discussion and enhance readability). Readers who are solely interested in key points can simply consult summary discussions at the beginning of each section. Although these transcriptions may be longer than a topic or point that could be summarized in a bulleted line or two, the participants' descriptions and explanations are included because they are both powerful and relatable in their own words. These examples were included because they represented key specific examples of discussion points, or common experiences. These examples should not, however, be interpreted as representative of all perspectives of DOT officials in these or other states.

Section 2: State Background, Revenues, and Funding

Energy Development Intensiveness

This chapter reviews background information on energy production statistics, revenue from energy development and expenditures (if known), and transportation related revenue and expenditures for Colorado, Kansas, North Dakota, Oklahoma, Pennsylvania, Utah, West Virginia, and Wyoming. These eight states were selected for interviews with their DOT officials due to the intensiveness of their energy development activity in recent years. Crude oil production, crude oil well development, natural gas well development, and wind turbine development were the types of energy development that were considered. These energy production categories were selected because they are especially likely to have truck traffic that can impact roadways.

Crude oil energy development impacts roadway traffic in two ways:

- Crude oil produced from many existing (already-developed) wells is removed from lease tankage at the well site by tanker truck and taken directly to refineries or to transloading facilities that connect with rail, pipeline, or barge modes (as applicable).
- During development of new crude oil wells, a wide range of truck traffic is used in site preparation and support of drilling activity, especially during times when hydraulic fracturing is taking place.

While development of natural gas wells also has a wide range of truck traffic for site preparation and drilling/fracking, natural gas produced from wells does not have a significant truck transportation component. Rather, extracted gas is transported via gathering lines to gas conditioning/processing facilities and then to gas transmission pipeline systems. Wind energy development also has significant truck traffic for site development and turbine installation. This includes heavy-duty trucks associated with site preparation and oversize trucks hauling wind turbine components. Additional information on energy development intensiveness measures used for this study can be found in Appendix A.

Oil and Gas Taxes and Revenue Allocations

TTI reviewed information about state oil and gas taxes and revenue allocations. Table 2 summarizes the various oil and gas production taxes and their allocations by state.

Table 2. Taxes on the Production and Severance of Oil and Gas and Tax Revenue Allocation.

State	Tax Type	Tax Description	Revenue Allocation
CO	Severance	<p>Levied on the gross income from crude oil, natural gas, and oil and gas based on gross income:</p> <ul style="list-style-type: none"> • 2% if income less than \$25,000 • \$500 plus 3% of the excess over \$24,999 for income \$25,000–\$99,999 • \$2,750 plus 4% of the excess over \$99,999 for income \$100,000–\$299,999 • \$10,750 plus 5% of the excess over \$299,999 for income over \$300,000 • 4% tax on shale oil gross proceeds <p>Exempt:</p> <ul style="list-style-type: none"> • Oil produced from any well that produces 15 barrels per day or less of oil • Gas produced from wells that produce 90,000 cubic feet or less of gas per day 	<p>For oil and gas, tax revenues deposited in the state general fund:</p> <ul style="list-style-type: none"> • \$1.5 million transferred into the innovative energy fund • Of remaining revenues: <ul style="list-style-type: none"> ○ 50% credited to the state trust fund for the Department of Natural Resources. Of this: <ul style="list-style-type: none"> ▪ 50% to the Perpetual Fund⁽¹⁾ ▪ 50% to the Operational Fund⁽¹⁾ ○ 50% credited to the Local Impact Fund for the Department of Local Affairs. Of this: <ul style="list-style-type: none"> ▪ 70% to local government grant projects⁽¹⁾ ▪ 30% direct distribution to local governments⁽¹⁾ <p>For shale oil:</p> <ul style="list-style-type: none"> • 40% of revenues deposited in the state general fund • 40% of revenues deposited in state severance tax trust fund • 20% of revenues deposited in local government severance tax fund
	Ad valorem	<ul style="list-style-type: none"> • Rates vary by county • Severance tax can be reduced to credit 87.5% of ad valorem taxes 	Revenues go directly to Colorado local governments
	Oil and Gas Conservation Levy	Maximum \$0.0017 of market value at wellhead	<ul style="list-style-type: none"> • Revenues deposited in the Oil and Gas Conservation Environmental Response Fund • Fund may not exceed \$4 million
KS	Mineral Severance	<ul style="list-style-type: none"> • \$1 per ton of coal • 8% on gross value of oil or gas • Exemptions for gas wells with gross value less than or equal to \$87 per day • Exemptions for low-producing oil wells 	<p>Money for refunds distributed into the mineral production tax refund fund. Of remaining revenues:</p> <ul style="list-style-type: none"> • 7% deposited in the Special County Mineral Production Tax Fund. Revenue distributed based on the proportion to the overall taxes collected from each county:⁽²⁾ <ul style="list-style-type: none"> ○ 50% deposited in the county's general fund for transportation purposes⁽²⁾ ○ 50% allocated to school districts in the county⁽²⁾ • Remaining revenues deposited in the general state fund. However, if monthly revenue is greater than that forecasted: <ul style="list-style-type: none"> ○ 14.63% of surplus deposited in the incentive for technical education fund; amount deposited not to exceed \$1.5 million ○ 85.37% of surplus deposited in the technical education fund; amount deposited not to exceed \$8,750,000
	Oil and Gas Conservation Fee	<ul style="list-style-type: none"> • Oil: 91 mills per barrel • Gas: 12.9 mills per thousand cubic feet (MCF) 	Revenues deposited in the Conservation Fee Fund

State	Tax Type	Tax Description	Revenue Allocation
ND	Oil and Gas Gross Production	<ul style="list-style-type: none"> • \$0.1143 per MCF of gas (changes annually on July 1) • 5% of gross value of natural gas or oil 	<p>20% deposited with the state treasurer:⁽³⁾</p> <ul style="list-style-type: none"> • 33.3% to the Oil Impact Fund⁽³⁾ • 66.7% to the State General Fund⁽³⁾ <p>80% allocated between the State General Fund and the producing county according to their revenue:⁽³⁾</p> <ul style="list-style-type: none"> • Producing county allocation based on the level of revenue (State General Fund allocation):⁽³⁾ <ul style="list-style-type: none"> ○ 100% up to \$2 million (0%)⁽³⁾ ○ 75% \$2 to \$3 million (25%)⁽³⁾ ○ 50% \$3 to \$4 million (50%)⁽³⁾ ○ 25% \$4 to \$18 million (75%)⁽³⁾ ○ 10% over \$18 million (90%)⁽³⁾ • Counties must allocate the tax revenue they receive:⁽³⁾ <ul style="list-style-type: none"> ○ 45% to county general fund⁽³⁾ ○ 35% to school districts⁽³⁾ ○ 20% to incorporated cities within county⁽³⁾ • Counties must levy at least 10 mills for combined transportation purposes in order to receive their share of gross production revenue⁽³⁾
	Oil Extraction	<ul style="list-style-type: none"> • 6.5% of gross oil value • 4% of gross oil value if well qualifies for reduced rate • 2% of gross oil value for qualifying wells in Bakken formation 	<ul style="list-style-type: none"> • 30% Legacy Fund³ • 30% State Share (General Fund, \$300M cap)³ • 20% Water Resources Trust Fund³ • 20% Education Purposes³
OK	Gross Production Severance	<ul style="list-style-type: none"> • Tax on gross production based on monthly average crude oil and gas prices: <ul style="list-style-type: none"> ○ 7% if oil price equal to or greater than \$17 per barrel, gas price equal to or greater than \$2.10 per MCF ○ 4% if oil price less than \$17 but greater than or equal to \$14 per barrel, gas price less than \$2.10 and greater than or equal to \$1.75 per MCF ○ 1% if oil price less than \$14 per barrel, gas less than \$1.75 per MCF • The gross production tax is 1% for the first 48 months of production⁽⁴⁾ 	<p>Revenues distributed to:⁽⁵⁾</p> <ul style="list-style-type: none"> • County Bridge and Road Improvements Fund⁽⁵⁾ • County Highway Fund⁽⁵⁾ • School districts⁽⁵⁾ • General Revenue Fund⁽⁵⁾ • Other⁽⁵⁾ <p>Revenue distribution to these funds varies based on oil or gas tax rates</p>
	Petroleum Excise	0.095% of taxable oil or gas value	<p>Revenues from oil:</p> <ul style="list-style-type: none"> • 82.634% deposited to the General Revenue Fund • 10.526% deposited to Corporation Commission Plugging Fund • 6.84% deposited to the Interstate Oil Compact Fund of Oklahoma <p>Revenues for gas:</p> <ul style="list-style-type: none"> • 82.6045% deposited to the General Revenue Fund • 10.5555% deposited to the Corporation Commission Plugging Fund • 6.84% deposited to the Interstate Oil Compact Fund of Oklahoma

State	Tax Type	Tax Description	Revenue Allocation
OK (cont.)	Oil and Gas Production Fee	<ul style="list-style-type: none"> • \$0.0035 per barrel of petroleum liquid produced • \$0.00015 per MCF of natural gas produced • Oil and gas exempt from oil and gas production tax 	<ul style="list-style-type: none"> • 3% of revenues deposited in the Oklahoma Tax Commission Revolving Fund • Remaining revenues, before July 1, 2013, deposited in the Commission on Marginally Producing Oil and Gas Wells Revolving Fund • Remaining revenues, after July 1, 2013, deposited in the Sustaining Oklahoma's Energy Resources Revolving Fund
PA	Oil Company Franchise ⁽⁶⁾	3.5% tax on conventional petroleum revenue derived from the first sale of petroleum products ⁽⁶⁾	Revenue is dedicated to highway maintenance and construction ⁽⁷⁾
	Unconventional Gas Well Fee (No Severance Tax)	Impact fee based on a multi-year schedule contingent upon natural gas process and Consumer Price Index ⁸	<p>Impact fee revenue deposited in the Unconventional Gas Well Fund with the following earmarks:</p> <ul style="list-style-type: none"> • County Conservation Districts & Conservation Commission (50/50 split): \$2.5 million⁽⁸⁾ • Pennsylvania Fish and Boat Commission: \$1 million • Public Utility Commission: \$1 million • Department of Environmental Protection: \$6 million • PA Emergency Management Agency: \$750,000 • Office of State Fire Commissioners: \$750,000 • Dept. of Transportation: \$1 million • Marcellus Legacy Fund/Natural Gas Energy Development Program: \$10 million⁽⁸⁾ <p>Remaining 60% distributed to local governments:⁽⁸⁾</p> <ul style="list-style-type: none"> • Housing Affordability and Rehabilitation Enhancement Fund: \$2.5 million⁽⁸⁾ • Remaining 36% to counties with producing unconventional wells⁽⁸⁾ • Remaining 37% to municipalities with producing unconventional wells⁽⁸⁾ • Remaining 27% to municipalities that are contiguous or within 5 linear miles of municipalities with wells⁽⁸⁾ <p>Remaining 40% deposited in the Marcellus Legacy Fund:⁽⁸⁾</p> <ul style="list-style-type: none"> • 20% to the Commonwealth Financing Authority⁽⁸⁾ • 10% to the Environmental Stewardship Fund⁽⁸⁾ • 25% to the Highway Bridge Improvement Restricted Account (Pennsylvania DOT)⁽⁸⁾ • 25% for water and sewer projects⁽⁸⁾ • 15% for rehabilitation of greenways, recreation trails, open space, and nature areas⁽⁸⁾ • 5% for projects for liquefied natural gas or converting natural gas⁽⁸⁾

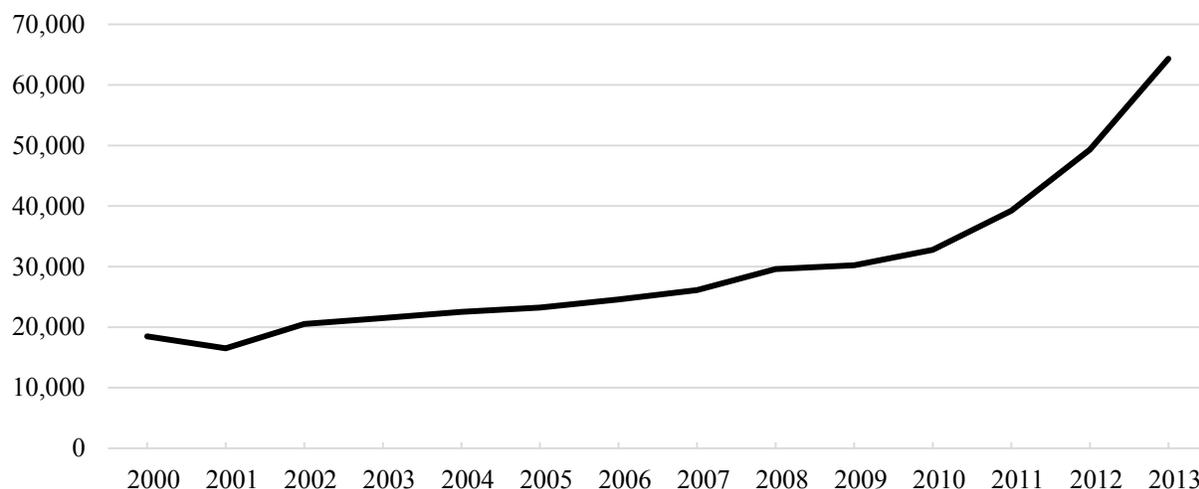
State	Tax Type	Tax Description	Revenue Allocation
UT	Oil and Gas Severance	<p>Oil (percent of market value):</p> <ul style="list-style-type: none"> • 3% if valued at \$13 or less per barrel • 5% if valued above \$13 per barrel <p>Gas (percent of market value):</p> <ul style="list-style-type: none"> • 3% if valued at \$1.50 or less per MCF • 5% if valued above \$1.50 per MCF • 4% of value for natural gas liquids <p>Taxes not imposed on oil and gas stockpiled for over 2 years, stripper wells, and the first 6 months of production for development wells. Enhanced recovery projects receive a 50% tax reduction</p>	<p>Revenues earmarked (via formula) to:</p> <ul style="list-style-type: none"> • Uintah Basin Revitalization Fund for revenues produced from oil or gas on Ute land • Navajo Revitalization Fund for revenues produced from Navajo Nation land <p>After earmarks:</p> <ul style="list-style-type: none"> • Revenues deposited to the general fund • Revenues exceeding \$27.6 million deposited in the state permanent trust fund
	Oil and Gas Conservation Fee	\$0.002 of the value of gas or oil	Revenues credited to the Oil and Gas Conservation Account of the General Fund
WV	Oil and Gas Severance	<ul style="list-style-type: none"> • 5% of gross value of natural gas or oil • Natural gas from wells producing less than 5,000 MCF per day and oil wells producing less than 0.5 barrels per day are exempt. Wells not producing marketable quantities for 5 consecutive years are exempt for up to 10 years 	<p>90% of revenue deposited in the general fund:</p> <ul style="list-style-type: none"> • First \$24 million of the severance taxes collected, including those from coal and other minerals, allocated to debt service for infrastructure bonds <p>10% allocated to counties and municipalities:</p> <ul style="list-style-type: none"> • 75% distributed to oil and gas producing counties • 25% distributed to all counties and municipalities, based on population densities <p>First \$4 million in revenues attributable to coalbed methane:</p> <ul style="list-style-type: none"> • 75% distributed to oil and gas producing counties • 25% distributed in equal shares to non-oil and gas producing counties, no producing county receiving less than a non-producing county
	Worker's Compensation Debt Reduction Act	<ul style="list-style-type: none"> • \$0.47 per MCF of natural gas • Tax will be terminated when governor declares liability provided for in its entirety 	Revenues deposited in the Workers' Compensation Old Fund
WY	Oil and Natural Gas Severance	<ul style="list-style-type: none"> • 6% of fair market value for natural gas or oil • 4% on stripper oil 	<ul style="list-style-type: none"> • 26.1% to the State General Fund⁽⁹⁾ • 27.5% to the Budget Reserve⁽⁹⁾ • 38.2% to the Permanent Wyoming Mineral Trust Fund⁽⁹⁾ • 2.8% to Water Development Funds I, II, & III⁽⁸⁾ • 0.8% to the Highway Fund⁽⁹⁾ • 1.7% to cities and towns⁽⁹⁾ • 0.7% to counties⁽⁹⁾ • 0.4% to the Capital Construction Account⁽⁹⁾ • 0.5% State Aid County Roads (Road Construction)⁽⁹⁾ • 1.3% to other misc. non-transportation accounts⁽⁹⁾
	Oil and Gas Conservation Fee	Up to 8/10 of a mill (\$0.0008) of oil and gas market value	Revenues credited to the Oil and Gas Conservation Commission

Note: All information is from Brown (10) except where denoted with a superscript number representing another source. Capitalizations of fund names from Brown are as listed in source.

Colorado

Colorado contains portions of several shale fields including the Niobrara, Pierre, and Hilliard-Baxter-Mancos. Energy production has sharply increased in recent years. Colorado was the sixth most productive state for natural gas in 2012 with 1,709,376 million cubic feet produced and was also the ninth highest producing crude oil state with 64,313,000 barrels in 2013 (11,12).

Colorado ranked tenth nationally in wind energy with 1,526 utility grade turbines as of 2013 (13). Figure 2 shows the annual growth in Colorado crude oil production from 2000 to 2013.



Source data: (11)

Figure 2. Total Annual Crude Oil Production (Thousands of Barrels).

Energy Development Revenue and Appropriations

Severance Taxes

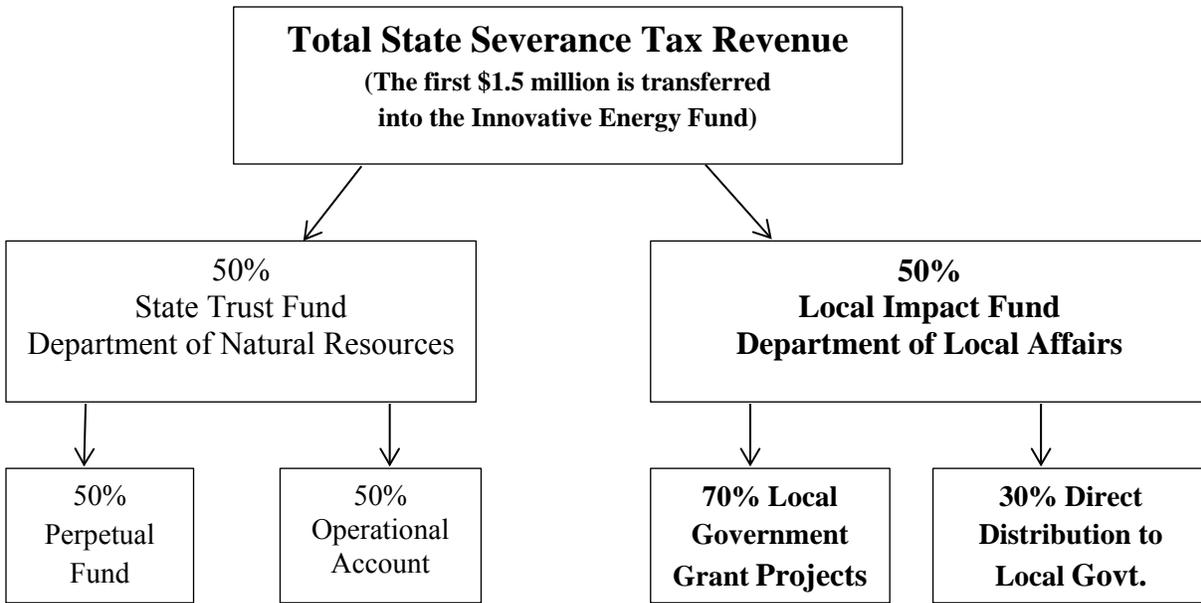
The State of Colorado imposes a severance tax on oil and gas on a progressive basis, as listed in Table 3.

Table 3. Gas and Oil Tax Bracket.

Gross Income of Production from Single Well	Tax
Under \$25,000	2% of gross income
\$25,000–\$99,000	\$500 base tax and 3% of excess over \$24,999
\$100,000–\$299,000	\$2,750 base tax and 4% of excess over \$99,999
300,000 and above	\$10,750 base tax and 5% of excess over \$299,999

Source: (14)

After a \$1.5 million transfer into the state’s innovative energy fund, the remaining revenue from the state severance tax is split 50/50 between the state trust fund (intended to maintain upkeep of natural resources such as forests) and the local impact fund. The local impact fund is for assisting local governments with addressing the impacts of energy development. Figure 3 gives an overview of the severance tax distribution.



Note: Bold represents funds going to transportation projects.
 Source: (1, 10)

Figure 3. Colorado Oil and Gas Severance Tax Distribution.

Colorado imposes a separate severance tax on shale oil, which is currently levied at 4 percent of the gross value from well production 180 days after commercial viability. This amount is joined with the other severance tax revenue and the severance tax revenue from metallic minerals, coal, and molybdenum to formulate the total severance tax revenues. Table 4 lists net severance tax incomes for Colorado in fiscal years (FY) 2010 through 2013.

Table 4. Oil and Gas Net Severance Tax Revenue for FY 2010–2013.

Fiscal Year	Revenue
2010	\$63,702,238
2011	\$137,589,353
2012	\$163,046,102
2013	\$136,083,569

Source: (14)

For oil shale severance tax revenue, 40 percent is deposited in the state general fund, 40 percent is deposited in the state severance tax trust fund, and 20 percent is deposited in the local government severance tax fund (10).

Ad Valorem Tax

Ad valorem tax rates vary by county, and the revenues are distributed directly to local governments within Colorado. Severance tax can be reduced to credit 87.5 percent of the ad valorem taxes (10).

Oil and Gas Conservation Levy

The Oil and Gas Conservation Levy has a maximum amount of \$0.0017 of the market value at the wellhead, and the revenues are deposited in the Oil and Gas Conservation Environmental Response Fund, which cannot exceed \$4 million (10).

Local Impact Fund and Local Government Grant Projects

The Energy and Mineral Impact Assistance (EMIA) Fund, established by the Colorado Legislature in 1977, provides financial assistance to communities socially and economically impacted by energy and mineral development for purposes of planning, construction, and maintenance of public facilities (15). Under this program, local jurisdictions can apply for grant aid as needed with documented evidence of need for funding. Local jurisdictions submit their information to a 12-member Energy and Mineral Impact Assistance Advisory Committee, which meets multiple times a year to consider applications for grants (15). The governor appoints seven members to the committee for four-year terms, and the remaining five members are state department executive directors or their designees (15). Among those jurisdictions eligible to receive funding are municipalities, counties, school districts, special districts, and other political subdivisions. The EMIA Fund categorizes grants into *Tier I*, *Tier II*, and *Tier III*, with qualifying criteria for each level.

Under the Colorado Department of Local Affairs Policy Guidelines, local jurisdictions whose roads/streets are directly impacted by energy development are encouraged to apply for funding from the EMIA Fund (16). These policy guidelines also encourage local jurisdictions to apply for grant funding to help fund replacement of road maintenance equipment and drainage improvement projects (16). Local jurisdictions may also apply for assistance for construction on state highways if the local jurisdiction bears partial financial responsibility for upkeep of the highways. Roads impacted by energy development receive higher priority and are more likely to receive committee approval. The Policy Guidelines also encourage local jurisdictions to apply for grant aid help to fund firefighting equipment, ambulances, public safety vehicles, and K–12 schools. However, while local jurisdictions can apply for funding for higher education and for regional councils of government, the Colorado Department of Local Affairs advises that applications for these two purposes will likely not receive approval from the EMIA Advisory Committee.

As previously mentioned, the EMIA Fund disburses three levels of grants to local jurisdictions: “Tier I includes grant awards of up to \$200,000. Tier II includes grant awards greater than \$200,000 up to \$1,000,000. The applications for grant awards in Tier I are reviewed by committee staff” (16). According to the Colorado Department of Local Affairs:

The applications for grant awards in Tier II are reviewed by the Energy Impact Advisory Committee. The Executive Director of the committee will make funding decisions as funds are available three times per year for Tiers I and II. Tier III criteria are in the development stage and are planned to go into effect when sufficient revenues become

available. It is anticipated that grant requests in this tier will be in the \$1,000,000 to \$10,000,000 range and will be made once yearly. It is anticipated that to be competitive for a Tier III grant, applications will require multi-jurisdictional collaboration requesting assistance to solve a multi-jurisdictional problem.

Energy Impact Fund receipts are volatile and follow the ups and downs of the industry’s development and production cycles. Due to this fluctuation, local government expectations may sometimes exceed the program’s revenue stream and capability to fund projects even though project selection criteria are met. In order to manage expectations and remain in a position to help the greatest number of energy impacted applicants, funding amounts for each of the tiers may be adjusted periodically as demand and revenue capability change. Any adjustments to the tier funding thresholds will be appropriately noticed on the department’s website and through information publications and websites of associations representing local government clients: the Colorado Municipal League, Colorado Counties, Inc., and the Colorado Special District Association.

General Transportation Revenue and Appropriations

Colorado imposes a 22 cent per gallon fuel tax. This revenue is used to fund the Colorado Department of Transportation (14). Table 5 lists the motor fuel tax revenues for FY 2010 through 2013. This revenue is disbursed into the Colorado Highway Users Tax Fund, which provides funds to maintain upkeep of the state transportation infrastructure.

Table 5. Motor Fuel Tax Collections.

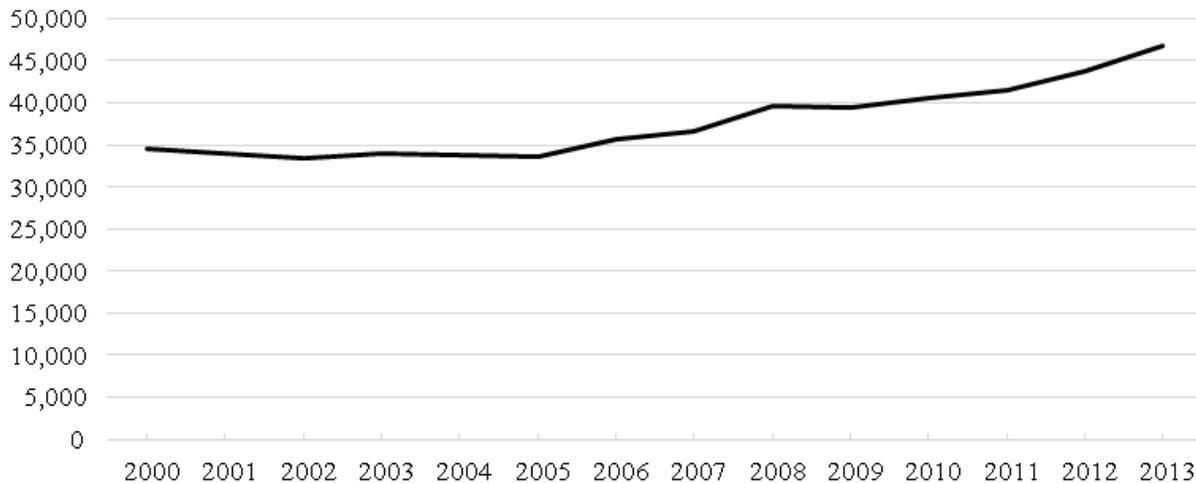
Fiscal Year	Receipts
2010	\$549,138,514
2011	\$553,834,279
2012	\$563,964,162
2013	\$557,377,936

Source: (14)

For 2013, the Colorado Highway Users Tax Fund received \$1,095,820,149 from mileage and fuel taxes, vehicle registrations, operator’s licenses, and control, emissions, and all other motor vehicle funds (14).

Kansas

Kansas contains portions of the Mississippi Lime Field and a sliver of the Niobrara Shale Field in the northwest portion of the state. Total crude oil production for the state in 2013 was 46.8 million barrels, with 51,566 operational wells (11,17). Figure 4 shows annual crude oil production in Kansas from 2000 to 2013. As shown, the state already had some levels of crude oil production prior to implementation of horizontal drilling and hydraulic fracturing techniques, as seen in other states during the past decade, and growth in crude oil production in recent years has been moderate. Kansas ranked ninth nationally in wind energy with 1,592 utility grade turbines as of 2013 (13).



Source data: (11)

Figure 4. Kansas Total Annual Crude Oil Production (Thousands of Barrels).

Total gas production in 2013 was 294,800 million cubic feet, with 24,648 operational wells (17). The Kansas Corporation Commission indicates that the oil and gas industry is the second largest industry in the state, generating \$6 billion each year and employing 28,000 industry personnel in the state. According to the Commission, “More than \$360 million each year from oil and natural gas production goes to roads, schools, and other public projects” (18).

Energy Development Revenue and Appropriations

Severance Tax

The State of Kansas collects an 8 percent severance tax of the gross value of oil and gas produced in the state. Gas wells that are considered low producing or have a gross value of less than or equal to \$87 per day are exempt from the severance tax (10). Seven percent of the severance tax revenue is deposited in the Special County Mineral Production Tax Fund, and the other 93 percent is deposited in the general state fund (10). However, if the amount of the 93 percent surpasses the monthly forecast, then 14.63 percent of the surplus is deposited in the incentive for technical education fund (not to exceed \$1,500,000) and 85.37 percent of the surplus is deposited in the technical education fund (not to exceed \$8,750,000) (10). In addition to oil and gas, the severance tax includes \$1.00 per ton of coal.

The revenue deposited in the Special County Mineral Production Tax Fund is distributed based on the proportion to the overall taxes collected from each county. For example, the largest severance tax collection came from Barber County, which means Barber County will receive the largest share of revenue from the special county fund. Fifty percent of the amount allocated to the county is deposited in the county’s general fund, and the county may use those funds for transportation purposes (2). Counties must allocate the other 50 percent to school districts in their county. Table 6 and Table 7 provide an overview of revenue estimates and allocations of severance tax revenue, respectively, for FY 2013 and 2014.

Table 6. Kansas Oil and Gas Severance Tax Revenue by Fiscal Year.

Source	FY 2013	FY 2014
Gas	\$25,000,000	\$35,297,000
Oil	\$72,900,000	\$105,080,000
Total	\$97,900,000	\$140,377,000

Source: (19)

Table 7. Kansas Allocation of Severance Tax Revenue by Fiscal Year.

Revenue Category	Percentage	FY 2013*	FY 2014*
State General Fund	93%	\$91,047,000	\$130,550,610
Special County Mineral Production Tax Fund	7%	\$6,853,000	\$9,826,390
Total	100%	\$97,900,000	\$140,377,000

* Amounts were calculated based on percentages of the totals in Table 6.

Source: (10)

Oil and Gas Conservation Fee

Kansas also charges an oil and gas conservation fee of 91 mills (91/1,000 of a dollar) per barrel of oil and 12.9 mills per thousand cubic feet (MCF)¹ of gas. Revenue from this fee is deposited in the Conservation Fee Fund (10).

General Transportation Revenue and Appropriations

Kansas collects a 24 cent per gallon excise tax on gasoline and 26 cents per gallon on diesel fuel (20). Table 8 provides the combined total motor fuel tax revenue for FY 2012 and 2013. The revenue from this tax is distributed with 64.6 percent going to the State Highway Fund and 35.4 percent going to the Special City and County Highway Fund (21). Table 9 shows the motor fuel tax distribution for FY 2012 and 2013. The State Highway Fund is intended for use by the Kansas secretary of transportation for construction, improvements, reconstruction, and maintenance of the state highway system (22). The Special City and County Highway Fund is intended to assist local governments with transportation infrastructure needs (23).

¹ State natural gas production statistics from the EIA are typically reported in terms of millions of cubic feet. MCF is a different metric (1,000 MCF = 1 million cubic feet).

Table 8. Kansas Motor Fuel Tax Revenue.

Fiscal Year	Revenue
FY 2012	\$427,122,000
FY 2013	\$408,763,000

Source: (24)

Table 9. Kansas Motor Fuel Tax Distribution.

Apportionment	Percentage	FY 2012	FY 2013
State Highway Fund	64.6%	\$275,920,812	\$264,060,898
Special City and County Highway Fund	35.4%	\$151,201,188	\$144,702,102
Total	100%	\$427,122,000	\$408,763,000

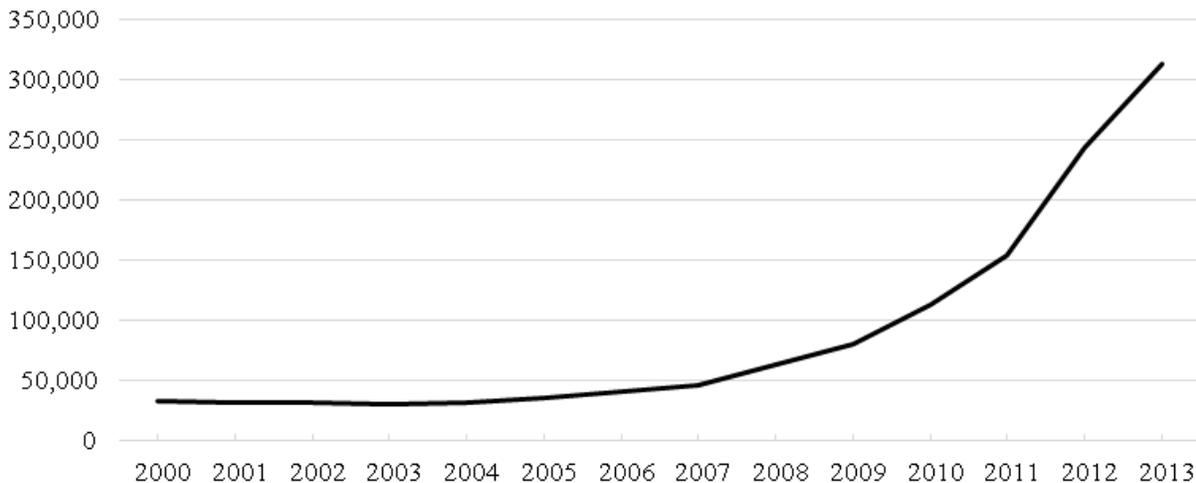
Source: (21)

As stated in Kansas Statute 79-3425c (23):

On each January 15, April 15, July 15, and October 15 of each year, the director of accounts and reports shall transfer \$625,000 to the county equalization and adjustment fund from the Special City and County Highway fund and on such dates the state treasurer shall apportion and pay to the several counties of the state 57 percent of the moneys in the special city and county highway fund, created by Kansas Statute 79-3425c and amendments thereto, and shall apportion and pay to the several cities of the state the remaining 43 percent of such moneys.

North Dakota

North Dakota is a significant energy-producing state for both crude oil and wind energy. The primary geologic formation contributing to the substantial recent growth in petroleum activity is the Bakken Shale. North Dakota crude oil production increased from around 124,000 annual average barrels per day (BPD) in 2007 to around 663,000 annual average BPD in 2012. Figure 5 shows the annual growth in North Dakota crude oil production from 2000 to 2013 to over 313 million barrels produced altogether in 2013.



Source data: (11)

Figure 5. North Dakota Total Annual Crude Oil Production (Thousands of Barrels).

The number of gas wells in North Dakota has remained relatively constant, increasing by an average of only two wells per year between 2007 and 2012 based on analysis of EIA data. North Dakota ranked eleventh nationally in wind energy with 994 utility grade turbines as of 2013 (13).

Energy Development Revenue and Appropriations

North Dakota imposes two different sets of taxes on gas and oil producers: an oil extraction tax and a gross production tax (instead of ad valorem/property tax) on both gas and oil. The oil aspects of these taxes are calculated from the monthly gross values of the oil produced from the well (25). The tax imposed on gas production is an annually adjusted flat rate per MCF. North Dakota requires both the producers and purchasers of oil and gas to submit reports to the tax commissioner on a monthly basis, showing the volume and taxable value of sales of the production from each well. The purchaser is primarily responsible for remitting the tax on oil and gas bought during a production month.

Oil Extraction Tax

The oil extraction tax consists of a 6.5 percent tax levied from the gross value of oil at the point of extraction at the well, a 4 percent tax of the gross oil value if the well qualifies for a reduced rate, and a 2 percent tax of the gross oil value for qualifying wells in the Bakken formation (10). Table 10 lists the total oil extraction tax revenues in North Dakota by fiscal year; the percentage distribution of those taxes to various funds is listed in Table 11.

Table 10. Revenue from North Dakota Oil Extraction Tax by Fiscal Year.

Fiscal Year	Revenue
FY 2010	\$280,611,437
FY 2011	\$496,749,735
FY 2012	\$865,121,628

Note: North Dakota uses a July–June fiscal year.

Source: (3)

Table 11. North Dakota Oil Extraction Tax Distribution.

Fund	Percent Oil Extraction Tax
Legacy Fund (Funds Set Aside for Future Use during 2017 and Beyond)	30%
State Share (General Fund, \$300 Million Cap)	30%
Water Resources Trust Fund	20%
Education Purposes	20%

Source: (3)

Oil and Gas Gross Production Taxes

The revenue from the oil and gas gross production taxes constitutes funds dispersed to the state and local governments for various services including transportation and infrastructure. The oil gross production tax consists of a 5 percent tax on the monthly gross value of oil from wells. The current amount levied on gas production for 2010 through 2013 is \$0.1143 per MCF (3).

Table 12 lists total North Dakota oil and gas production tax revenue for fiscal years 2010 through 2012.

**Table 12. North Dakota Total
Gross Production Tax Revenue.**

Fiscal Year	Revenue
FY 2010	\$302,099,211
FY 2011	\$481,083,658
FY 2012	\$795,681,003

Source: (3)

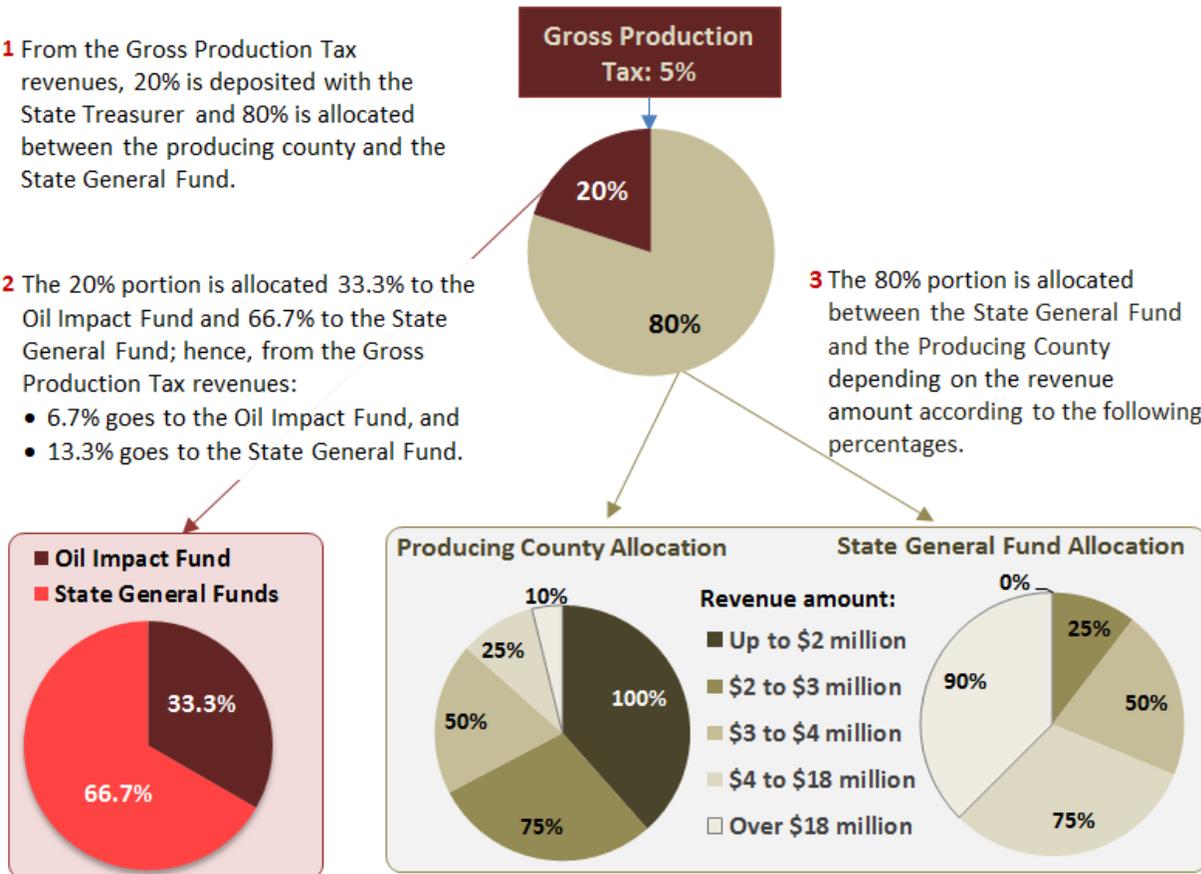
The revenue distribution for the production taxes follows a tiered schedule where the percentages of revenues shared between the North Dakota state government and political subdivisions (e.g., cities and counties) change depending on the amount of production tax collected. Twenty percent of the revenue from the gross production tax is deposited with the state treasurer. The state treasurer then allocates one-third of this portion to the Oil and Gas Impact Grant Fund and deposits the other two-thirds in the State General Fund. The other 80 percent of the production tax is allocated between the State General Fund and the producing county according to the amount of its revenue generation. Figure 6 illustrates the allocation process.

1 From the Gross Production Tax revenues, 20% is deposited with the State Treasurer and 80% is allocated between the producing county and the State General Fund.

2 The 20% portion is allocated 33.3% to the Oil Impact Fund and 66.7% to the State General Fund; hence, from the Gross Production Tax revenues:

- 6.7% goes to the Oil Impact Fund, and
- 13.3% goes to the State General Fund.

3 The 80% portion is allocated between the State General Fund and the Producing County depending on the revenue amount according to the following percentages.



Source: (3)

Figure 6. Allocation of North Dakota Gross Production Tax Revenue.

Counties are required to further split the tax revenue they receive: 45 percent is earmarked for the county general fund, 35 percent for the school districts, and 20 percent for the incorporated cities within the county. However, an allocation to a county that does not apportion at least 10 mills (10/1,000 of a dollar) for combined transportation purposes must be credited back to the State General Fund. In other words, counties that do not impose local taxes to specifically fund transportation projects are penalized and must forfeit their share of revenue from the gross production tax, and that money goes back into the State General Fund. County school allocations are split between the school and the Township Highway Fund based on allocation steps, allocation limits, and county population. City allocations are limited to \$750 per person.

Oil and Gas Impact Grant Fund (Portion of Oil Gross Production Tax)

The Oil and Gas Impact Grant Fund was created in 1989 to allow political subdivisions affected by oil/gas development to apply for grants. The North Dakota Department of Trust Lands also refers to this grant as the Energy Infrastructure and Impact Program. The main objective of the fund is to assist political subdivisions that are impacted by oil and gas development. Political subdivisions may apply for impact grants if they can demonstrate that their community has been

significantly impacted due to oil and gas development (e.g., a significant increase in traffic, needed road maintenance, population, the number of children attending local schools). The Energy Impact Office developed a grant rating system to evaluate each application based on the “objective of project, project readiness, result of energy activity, whether need is related to health and safety, and available budget for project” (26).

When political subdivisions apply for grant awards, they must document with supporting paperwork their need for the proposed project. After submission of the application, the Energy Impact Office sends a representative to hold meetings with officials from the applicant jurisdiction to allow local officials to make their case and justify why grant funding is needed for their jurisdiction. Officials on the Land Board use information from these meetings to make their decision about whether applicants will receive or be denied their funding requests. The North Dakota Land Board awards grants from this fund to eligible counties, cities, school districts, and other taxing districts (26). The five members of the Land Board are the governor, secretary of state, superintendent of public instruction, state treasurer, and attorney general (27).

Each year the Impact Fund makes four rounds of grant disbursements based on an established schedule for four categories: City Infrastructure (July), Emergency Services and Response (August), Township Roads and Transportation (October), and Other Political Subdivision Infrastructure (e.g., parks and airports) (December).

General Transportation Revenue and Appropriations

Section 11, Article X of the North Dakota State Constitution states “revenue from gasoline and other motor fuel excise and license taxation, motor vehicle registration and license taxes, shall be appropriated and used solely for construction, reconstruction, repair and maintenance of public highways, and the payment of obligations incurred in the construction, reconstruction, repair, and maintenance of public highways.” Table 13 lists revenues from fuel, vehicle registration, and excise taxes in North Dakota.

Table 13. North Dakota Transportation-Related Tax Revenues for 2011–2013.

Tax	Revenue	Percentage of Revenue
Motor Vehicle Fuel Tax	\$190,800,000	23%
Special Fuel Taxes	\$211,725,762	26%
Motor Vehicle Registration Fees	\$161,200,000	20%
Motor Vehicle Excise Tax	\$258,965,505	31%
Total Revenues	\$822,691,267	100%

Source: (28)

Currently, North Dakota imposes a 23 cent per gallon motor vehicle fuel tax that covers gasoline and gasohol (29). Special fuel taxes are imposed on biodiesel, kerosene, compressed natural gas, waste oil, propane, and soy oil, which are also subject to a 23 cent per gallon tax. Also, all

vehicles sold in North Dakota are subject to a 5 percent excise tax on the value of the purchase of the vehicle (30).

Table 14 lists the distribution of funds from transportation-related taxes. According to the North Dakota Legislative Branch, the State Highway Fund for the North Dakota Department of Transportation must be used for the following (in descending order of priority):

- A. The cost of maintaining the state highway system.
- B. The cost of construction and reconstruction of highways in the amount necessary to match federal aid granted to the state by the U.S. Government for road purposes.
- C. Any portion of the highway fund not allocated as provided in subdivisions A and B may be expended for the construction of state highways without federal aid (31).

For the Township Highway Fund, the state treasurer distributes (on a monthly basis) funding to counties “based on length of township roads in each county compared to the length of all township roads in the state. To receive any funds under this section, organized townships [within said counties] must provide 50 percent matching funds...for highway and bridge purposes” (31).

Table 14. North Dakota Distribution of Transportation-Related Taxes.

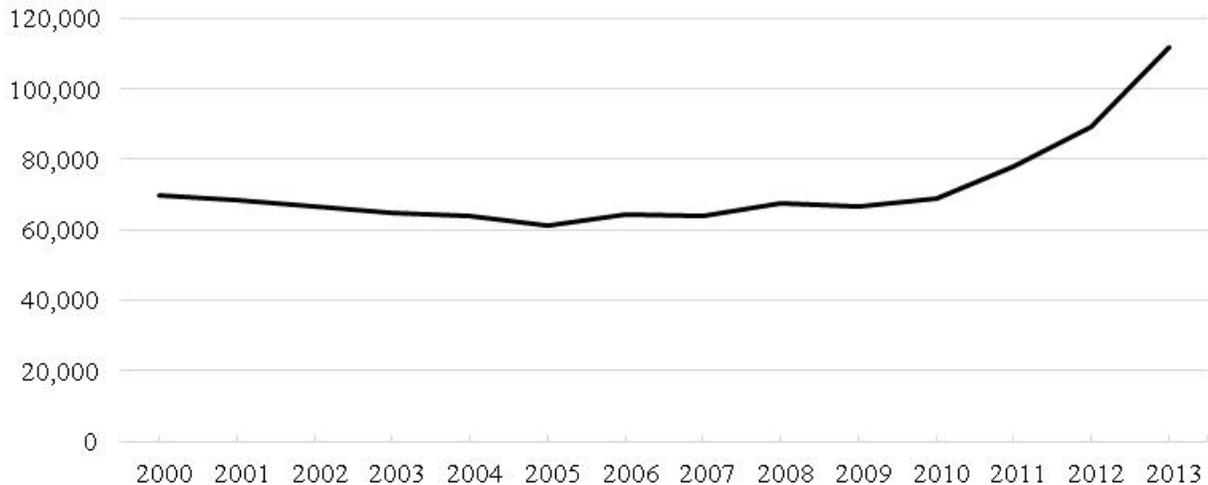
Destination	Percentage Allocation
State Department of Transportation (State Highway Fund)	61.3 %
Township Highway Fund	2.7 %
Public Transportation Fund	1.5%
Distributed to Counties Based on Proportion of Number of Vehicle Registrations Credited to Each County*	34.5%

* Officials disburse the initial \$5.5 million from this revenue source into the State Highway Fund. Percentages reflect the distribution breakdown after the initial \$5.5 million is taken out.

Source: (31)

Oklahoma

Oklahoma overlies the Woodford Shale play, with significant energy development activity in the state’s central, southeast, and northeast regions. Analysis of data from the U.S. Energy Information Administration (EIA) indicates Oklahoma was among the top five continental U.S. states in crude oil production and crude oil growth between 2007 and 2012 when evaluated against the state’s population, area, and state and county roadway miles. Figure 7 shows the annual growth in crude oil production from 2000 to 2013, with nearly 114 million barrels of oil produced in 2013.



Source data: (11)

Figure 7. Oklahoma Total Annual Crude Oil Production (Thousands of Barrels).

Oklahoma was also among the top 20 states between 2007 and 2012 in gas well development intensiveness based on analysis of EIA data. Oklahoma ranked seventh nationally in wind energy with 1,712 utility grade turbines as of 2013 (13).

Energy Development Revenue and Appropriations

Oil and Gas Gross Production Tax

The State of Oklahoma imposes a 7 percent gross production tax on oil if the statewide average price equals or exceeds \$17.00 per barrel, 4 percent if the average price is less than \$17.00 but equals or exceeds \$14.00, and 1 percent if the average price is less than \$14.00 (32). The state also imposes a 7 percent gross production tax on gas if the statewide average price equals or exceeds \$2.10 per MCF, 4 percent if the average price is less than \$2.10 but equals or exceeds \$1.75, and 1 percent if the average price is less than \$1.75 (32). In 2001, the Oklahoma Legislature lowered the tax rate to 1 percent for the first 48 months of production as an incentive to encourage additional drilling operations within the state (4). Table 15 lists the distribution of the gross production tax from oil, and Table 16 lists the distribution of the gross production tax from natural gas; the board of the Oklahoma Tax Commission determines both distributions.

Table 15. Oklahoma Distribution of Gross Production Tax from Oil.

Apportionment	FY 2012 (Thousands of Dollars)	Percentage of Total	FY 2013 (Thousands of Dollars)	Percentage of Total
Returned to Counties for Road and Bridge Improvement Fund	\$19,482	4%	\$14,771	4%
Returned to Counties for Highways	\$42,133	8%	\$40,313	10%
School Districts	\$42,133	8%	\$40,313	10%
General Revenue Fund	\$181,071	34%	\$171,211	41%
Other	\$245,375	46%	\$152,110	26%
Total	\$530,194	100%	\$418,717	100%

Source: (5, 33)

Table 16. Oklahoma Distribution of Gross Production Tax from Natural Gas.

Apportionment	FY 2012 (Thousands of Dollars)	Percentage of Total	FY 2013 (Thousands of Dollars)	Percentage of Total
Returned to Counties for Road and Bridge Improvement Fund	\$0	0%	\$0	0%
Returned to Counties for Highways	\$28,193	9%	\$22,229	23%
School Districts	\$28,193	9%	\$22,229	23%
General Revenue Fund	\$249,408	82%	\$50,400	53%
Other	\$0	0%	\$0	0%
Total	\$305,794	100%	\$94,859	100%

Source: (5, 33)

Oklahoma uses the County Road and Bridge Improvements Fund (CRBI) as one funding source for county highways (34). Sources of CRBI funds include 3.745 percent of the total gross production tax on oil and different fuel taxes. The Oklahoma Department of Transportation (ODOT) is the primary agency that decides how to distribute these funds. The funds are distributed to counties based on the need to replace structurally deficient bridges and maintain roadways used for school bus routes. Counties must request special permission from ODOT if they intend to use more than \$100,000 on a project that is not directly related to either structurally deficient bridges or school bus route maintenance (34). Table 17 lists the revenue sources for the CRBI and the percentage of revenues from each source.

Table 17. Oklahoma County Road and Bridge Improvement Fund Revenues.

Source	Tax Rate	2013 CRBI Revenue	Percent of Revenue
Gross Production Tax (Oil)	3.745%	\$14,770,825	60%
Diesel Fuel Excise Tax	(13 Cents/Gallon)	\$3,367,801	13%
Gasoline Excise Tax	(16 Cents/Gallon)	\$6,416,704	26%
Special Fuel Tax	(16 Cents/Gallon)	\$810	<1%
Total Revenue		\$24,556,140	100%

Source: (4, 35)

The main account through which Oklahoma counties receive their road funding is the County Highway Fund. Sources for the County Highway Fund include 7.14 percent of the gross production taxes on oil and natural gas, various fuel taxes, and various motor vehicle fees. These funds are distributed to county treasuries based on county land area, road mileage, and population, and are expended on order of the county's respective board of county commissioners

for county highways (36). Table 18 lists revenue sources for the County Highway Fund and their apportionment.

Table 18. Oklahoma County Highway Fund Revenue Sources.

Source	Tax Rate	2013 County Highway Fund Revenue	Percentage of Revenue
Gross Production Tax (Oil)	7.14%	\$40,312,679	15%
Gross Production Tax (Gas)	7.14%	\$22,229,499	9%
Diesel Fuel Excise Tax	(13 Cents/Gallon)	\$65,489,370	25%
Gasoline Excise Tax	(16 Cents/Gallon)	\$83,903,219	32%
Special Fuel Tax	(16 Cents/Gallon)	\$9,178	<1%
Motor Vehicle Collections	(Fees)	\$47,738,002	18%
Total		\$259,681,947	100%

Source: (5)

Petroleum Excise Tax

The State of Oklahoma also imposes a petroleum excise tax of 0.095 percent of taxable oil or gas value (10). Table 19 provides the distributions of the petroleum excise tax for both oil and gas.

Table 19. Distribution of the Oklahoma Petroleum Excise Tax.

Distribution	Revenue from Oil	Revenue from Gas
General Revenue Fund	82.634%	82.6045%
Corporation Commission Plugging Fund	10.526%	10.5555%
Interstate Oil Compact Fund of Oklahoma	6.84%	6.84%
Total	100%	100%

Source: (10)

Oil and Gas Production Fee

Oklahoma also charges an oil and gas production fee of \$0.0035 per barrel of petroleum liquid produced and \$0.00015 per MCF of natural gas produced (10). Three percent of the oil and gas production fee revenue is deposited in the Oklahoma Tax Commission Revolving Fund, while the remaining 97 percent is deposited in the Sustaining Oklahoma's Energy Resources Revolving Fund, which began July 1, 2013 (10). Before that date, the remaining 97 percent was deposited in the Commission on Marginally Producing Oil and Gas Wells Revolving Fund (10).

General Transportation Revenue and Appropriations

Along with gross production taxes on energy sources that are used for the CRBI and County Highway Fund, as described above, Oklahoma has other transportation-related funds that are sourced from a variety of taxes and fees, and used for transportation applications at the state and local levels.

State Transportation Fund

The State of Oklahoma imposes a variety of fees, which include appropriations from the diesel fuel tax, gasoline tax, special fuel tax, motor vehicle taxes, and a motor vehicle collections fee,

deposited in the State Transportation Fund (see Table 20). The State Transportation Fund is used for ODOT's operations (37).

Table 20. Appropriations to the Oklahoma State Transportation Fund.

Source	Tax Rate	2013 State Transportation Fund Appropriation	Percentage of Revenue
Diesel Fuel Excise Tax	(13 Cents/Gallon)	\$65,489,000	32%
Gasoline Excise Tax and CNG Excise Tax	(16 Cents/Gallon) (5 Cents)	\$136,786,000	67%
Motor Vehicle Collections	(Fees)	\$1,934,000	<1%
Special Fuel Decals	(Fees)	\$88,00	<1%
Special Fuel Tax	(16 Cents/Gallon)	\$19,000	<1%
Total		\$204,317,000	100%

Source: (5)

Other Transportation Funds

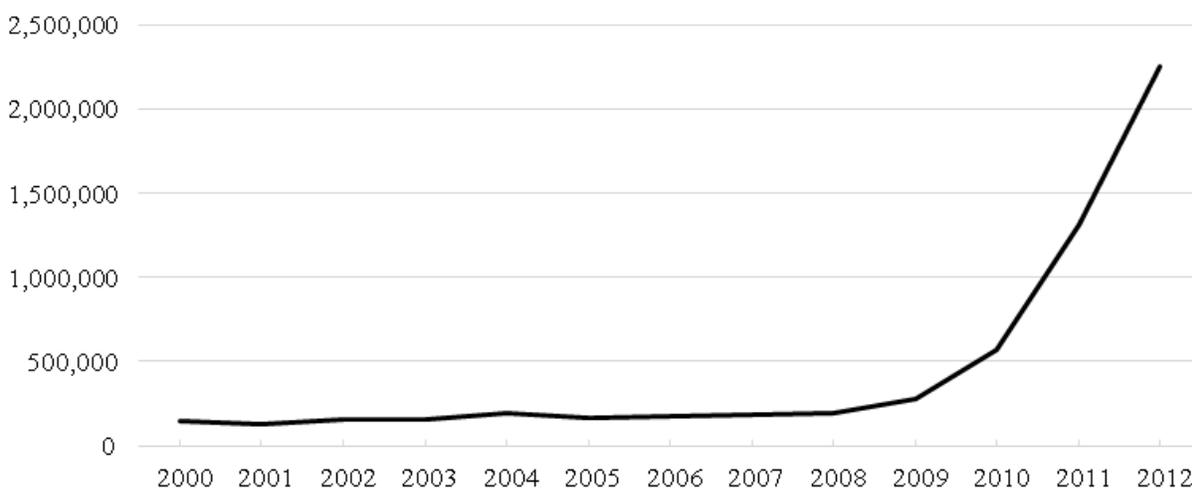
ODOT also receives funding from the County Improvement for Road and Bridges Fund (CIRB), not to be confused with the CRBI described previously. The collections from this fund are intended to be distributed equally among ODOT's eight field divisions, and the divisions are free to spend funds within their jurisdiction. Allowable expenditures include construction or repair of county bridges, construction of county roads, project engineering, right of way, construction of roadway structures, project management, and matching of other local or federal funds (38). CIRB revenue from motor vehicle collections totaled \$99,297,039 in 2013, which equals 14.7 percent of the total motor vehicle collections (5). According to ODOT, the Oklahoma Legislature will increase the amount of motor vehicle collections allocated to the CIRB to 20 percent in FY 2014 (39).

In the mid-2000s, Oklahoma possessed the most structurally deficient bridges in the country (percentage-wise) (40). To address bridge deficiencies, the Oklahoma Legislature established the High Priority Bridge Fund, which ODOT can use to repair and maintain bridges across the state. In 2013, total revenue for the fund was around \$5.9 million (5), including \$1,393,227 from the diesel excise fuel tax (1.31 percent of that tax), and \$4,539,461 from the combined gasoline excise tax and compressed natural gas tax (1.53 percent of those combined taxes).

Another fund established by the Oklahoma Legislature to address roads in disrepair is the Rebuilding Oklahoma Access and Driver Safety (ROADS) Fund. This is another fund that can be used for structurally deficient bridges and highway maintenance. This funding bypasses the appropriations system and is sourced from income taxes. The Oklahoma Legislature intends to incrementally grow the ROADS Fund by \$59.7 million per year beginning in FY 2014 until this fund reaches \$575 million (37, 41).

Pennsylvania

With a significant amount of area overlying the Marcellus, Utica, and Devonian Shale formations, Pennsylvania saw an average increase of 487 natural gas wells per year between 2007 and 2012, according to TTI analysis of data from the EIA. Figure 8 shows the annual growth in natural gas production from 2000 to 2012, with total natural gas marketed production of 2,256,696 million cubic feet in 2012.



Source data: (42)

Figure 8. Pennsylvania Total Annual Natural Gas Production (Millions of Cubic Feet).

Energy Development Revenue and Appropriations

Pennsylvania currently does not impose a severance or extraction tax on conventional natural gas production within the state. Pennsylvania imposes a 3.5 percent tax on conventional petroleum revenue derived from the first sale of petroleum products (43, 44).

In 2012, the Pennsylvania Legislature passed Act 13 to impose broad new regulations on unconventional oil and gas wells. One of the more significant developments with Act 13 came with the imposition of an impact fee on every well drilling for gas in the Marcellus Shale formation. The impact fee constitutes a multi-year fee schedule based on natural gas prices and the Consumer Price Index (45). In 2012, drillers paid \$45,000 per well. Table 21 shows the total impact fee revenues, and Table 22 shows the distribution of funds.

Table 21. Pennsylvania Impact Fee Revenue by Year.

Year	Revenue
2013	\$225,752,000
2012	\$202,472,000
2011	\$204,210,000

Source: (46)

Table 22. Pennsylvania 2011 Act 13 Revenue Distributions.

Revenue Recipient	Amount
Funds Initially Taken for Miscellaneous Projects	\$23,000,000
County Conservation Districts and Conservation Commission (50/50 Split)	\$2,500,000
Fish and Boat Commission	\$1,000,000
PA Public Utility Commission (Administration of Chapter 23 and 33)	\$1,000,000
Department of Environmental Protection	\$6,000,000
PA Emergency Management Agency	\$750,000
Office of State Fire Commissioner	\$750,000
Department of Transportation	\$1,000,000
Marcellus Legacy Fund/Natural Gas Energy Development Program	\$10,000,000
Remaining 60% Distributed to Local Governments	\$108,726,000
Housing Affordability and Rehabilitation Enhancement Fund	\$2,500,000
36% to Counties with Producing Unconventional Wells	\$38,241,360
37% to Municipalities with Producing Unconventional Wells	\$39,303,620
27% to Municipalities That Are Contiguous or within 5 Linear Miles of Municipalities with Wells	\$28,681,020
Remaining 40% Deposited in Marcellus Legacy Fund	\$72,484,000
20% to Commonwealth Financing Authority	\$14,496,800
10% to Environmental Stewardship Fund	\$7,248,400
25% to Highway Bridge Improvement Restricted Account (Pennsylvania DOT)	\$18,121,000
25% for Water and Sewer Projects	\$18,121,000
15% for Rehabilitation of Greenways, Recreation Trails, Open Space, and Nature Areas	\$10,872,600
5% for Projects for Liquefied Natural Gas or to Convert Natural Gas	\$3,624,200
Total	\$204,210,000

Source: (8)

Local governments are free to use funds they receive from the impact fee as they see fit. Pennsylvania legislators purposefully used broad language to allow local governments a degree of freedom with regard to how local officials want to use their funding. Local governments often use these funds for construction, reconstruction, maintenance, and repair of roadways, bridges, and public infrastructure (8). Table 23 lists impact fee revenues for a select number of counties with significant hydraulic fracturing activity.

Table 23. Pennsylvania’s Top Receiving Counties of Impact Fee Revenue in 2013.

County	Impact Fee Revenue
Bradford	\$7,054,001
Washington	\$6,115,863
Susquehanna	\$5,456,749
Lycoming	\$5,099,521
Tioga	\$4,404,638
Greene	\$3,627,570
Butler	\$1,748,751

Source: (46)

As indicated in Table 22, a portion of the Act 13 revenue is designated for the Marcellus Legacy Fund. Lawmakers designated 25 percent of the portion allocated to the Marcellus Legacy Fund to the State Highway Bridge and Improvement Account. Funds in this account are distributed to counties, based on the proportion of their population compared to the state’s population, to help fund maintenance on state highways and replacement or repair of deteriorated bridges owned by a county or municipality. According to information from Table 22, this was around 8.9 percent of overall impact fee revenues in 2011.

Act 13 prohibits local jurisdictions from making regulations more stringent than state regulations, including an attempt to prohibit local jurisdictions from imposing strict weight limits on roads near well sites. However, under Pennsylvania Provision 4902, Pennsylvania localities are still allowed to set weight restrictions if, by conducting an engineering and traffic study, they determine that the highway or bridge may be damaged or destroyed unless use by vehicles is prohibited or the permissible size or weight of vehicles is reduced (47). The Pennsylvania Supreme Court ruled the clause of Act 13 prohibiting local jurisdictions from imposing further regulations unconstitutional (48). Questions remain as to whether the rest of Act 13 will be held in legal standing in the future.

General Transportation Revenue and Appropriations

Pennsylvania’s state-sourced revenue for transportation comes from three sources: a liquid fuels tax, licenses and fees, and other revenue (turnpikes, interest, and fines/penalties). The revenues from these three sources (Table 24) are deposited in Pennsylvania’s Motor License Fund, which is used by the Pennsylvania Department of Transportation (PennDOT) for various activities (Table 25). Pennsylvania also received approximately \$1.5 billion in federal funds for highway capital and maintenance (49).

Table 24. Pennsylvania Motor License Fund Revenues in FY 2011 and 2012.

Source	FY 2011–2012 Revenue	Percentage of Revenue
Liquid Fuels Tax	\$2,308,000,000	61%
Licenses and Fees	\$894,000,000	25%
Other Revenues (Turnpikes, Interest, and Fines/Penalties)	\$277,000,000	14%
Total	\$3,479,000,000	100%

Source: (49)

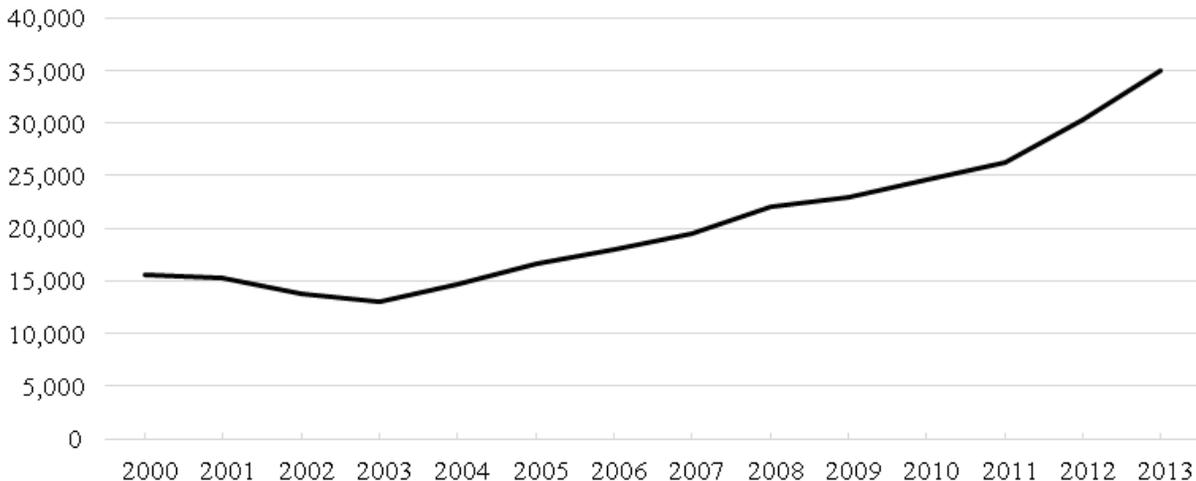
Table 25. Pennsylvania Motor License Fund Expenditures in FY 2011 and 2012.

Apportionment	FY 2011–2012 Expenditures	Percentage of Expenditures
Highway Maintenance	\$1,439,000,000	41%
State Police	\$565,000,000	16%
Local Subsidy	\$393,000,000	11%
Turnpikes	\$91,000,000	3%
Highway Bridge Improvement	\$655,000,000	19%
State Administration	\$125,000,000	4%
Misc. Expenditures (Debts, Highway and Bridge Debt Service, and Tort Claims)	\$156,000,000	4%
PennDOT Misc. Expenditures (General Government and Refunds)	\$55,000,000	2%
Total	\$3,479,000,000	

Source: (50)

Utah

Utah is a significant energy-producing state for both crude oil and natural gas. The state overlies three shale formations: the Hermosa, Mancos, and Manning Canyon shale plays, primarily in the eastern part of Utah. Utah crude oil production increased from around 54,000 annual average BPD in 2007 to around 83,000 annual average BPD in 2012. Figure 9 shows Utah’s annual crude oil production from 2000 to 2013.



Source data: (11)

Figure 9. Utah Total Annual Crude Oil Production (Thousands of Barrels).

Seventy percent of Utah’s oil output comes from the Uintah Basin, which consists of Uintah, Duchesne, Grand, and Carbon Counties (51). The number of active gas wells in Utah has

increased from around 5,700 wells in 2007 to around 6,900 wells in 2012, based on analysis of EIA data.

Energy Development Revenue and Appropriations

Severance Tax

Utah imposes severance taxes on both oil and gas, whose rates are (52):

- For oil, 3 percent of the value for the first \$13 per barrel of oil, and 5 percent if the value is \$13.01 or more.
- For natural gas, 3 percent of the value for the first \$1.50 per MCF, and 5 percent if the value is \$1.51 or more.
- For natural gas liquids, 4 percent of the taxable value of natural gas liquids.

According to the National Conference of State Legislatures, taxes are not imposed on oil and gas stockpiled for over two years, stripper wells, and the first six months of production for development wells, and enhanced recovery projects receive a 50 percent tax reduction (10). After allocations for the Uintah Basin Revitalization Fund and Navajo Revitalization Funds are satisfied with revenue produced from Ute and Navajo lands, respectively, all remaining revenues from the oil and gas severance tax are deposited in the state’s general fund, and revenues that exceed \$27,600,000 are deposited in the state permanent trust fund (10, 53). Table 26 lists the Utah severance tax revenues from the previous two fiscal years.

Table 26. Utah Revenue from Oil and Gas Severance Tax.

Source	2012	2013
Oil and Gas Severance Tax	\$65,540,973	\$53,164,253

Sources: (54, 55)

Oil and Gas Conservation Fee

The State of Utah charges an oil and gas conservation fee of \$0.002 of the value of gas or oil (10). The revenue from the oil and gas conservation fee is credited to the Oil and Gas Conservation Account of the General Fund (10).

General Transportation Revenue and Appropriations

Table 27 and Table 28 provide a financial overview of the Utah Department of Transportation (UDOT). Only a small portion of UDOT’s funding comes from the General Fund where severance taxes are deposited. The revenue from special transportation permits, vehicle registration fees, temporary permits, safety inspection fees (some of which relate to energy development traffic) all fall under the license, permits, and fees category (56). Many rural Utah counties are composed mostly of tax-exempt federal land, which leaves local governments without any substantial tax revenue. The revenues listed under the mineral lease revenue category are payments from the Federal Government to assist state and local entities to maintain

infrastructure in these areas (57). However, local entities must expend all leasing funds within one fiscal year, which is why the amounts are identical for both revenues and expenditures. The differences in total revenue and expenditures are due to the timing of payments made on projects, which are not tied to a fiscal year.

Table 27. Utah Transportation Funding Sources.

Source	FY 2013 Amounts
State General Fund	\$1,525,600
Mineral Lease Revenue from Federal Government	\$54,448,863
Sales & Use Tax	\$425,542,110
Motor & Special Fuels Tax	\$358,227,328
Other Taxes	\$9,797,091
Federal Contracts & Grants	\$399,162,164
Charges for Services & Royalties	\$41,399,095
Licenses, Permits & Fees	\$171,368,774
Cooperative Agreements	\$34,386,422
Miscellaneous & Other	\$14,575,106
Total	\$1,510,432,553

Source: (56)

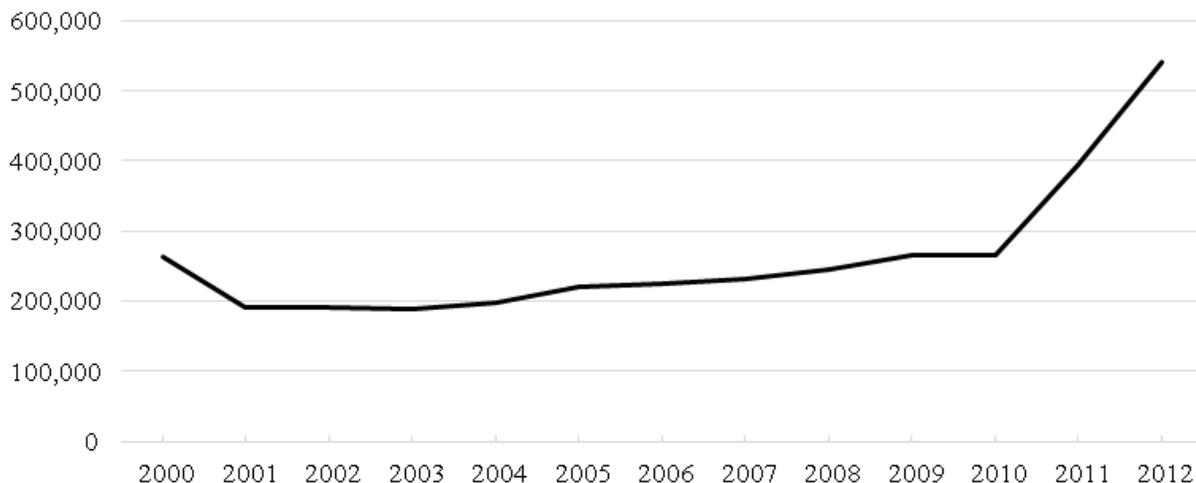
Table 28. Utah Transportation Expenditures.

Destination	FY 2013 Amounts
Administration	\$62,922,269
Operations	\$205,169,704
Debt Service	\$361,449,587
B & C Allocations (Distribution to Local Governments)	\$128,977,784
Mineral Leases	\$54,448,863
Other State Agencies	\$11,920,900
Highway Construction Projects & ROW	\$898,886,626
Total	\$1,723,775,733

Source: (56)

West Virginia

West Virginia is the ninth ranked state in gas output; the state produced 539,860 million cubic feet of natural gas in 2012, as shown in Figure 10 (58). The state holds preeminent power to regulate oil and gas in the state because the courts have nullified most attempts by local governments to impose regulations on hydraulic fracturing (59). According to the West Virginia Department of Environmental Protection, which oversees gas and oil production in the state, West Virginia possesses 55,000 active gas and oil wells (60).



Source data: (58)

Figure 10. West Virginia Total Annual Natural Gas Gross Withdrawals (Millions of Cubic Feet).

Energy Development Revenue and Appropriations

Severance Tax

West Virginia imposes a 5 percent severance tax on the gross value of both natural gas and oil producers in the state (10). The initial \$24 million of 90 percent of revenues from oil and gas severance taxes is allocated for debt service on infrastructure bonds, and the remainder is disbursed to the state’s general fund; the other 10 percent is allocated to local governments (10). Of the 10 percent portion allocated to local governments, 75 percent is allocated to oil- and gas-producing counties, while the remaining 25 percent is allocated to all remaining counties and municipalities based on their population (61). However, according to the National Conference of State Legislatures, natural gas from wells that produce less than 5,000 MCF per day and oil wells that produce less than 0.5 barrels per day are exempt, and wells not producing marketable quantities for five consecutive years are exempt for up to 10 years (10). Table 29 displays the allocations to the State General Fund and local governments from 2010 to 2013.

Table 29. West Virginia Severance Tax Revenue Distribution.

Source	2010	2011	2012	2013
90% to State General Fund				
Debt Service for Infrastructure Bonds	\$24,000,000	\$24,000,000	\$24,000,000	\$24,000,000
Remaining to State General Fund*	\$29,743,266	\$30,837,108	\$41,902,653	\$38,718,777
10% to Local Governments				
75% to Oil- and Gas-Producing Counties	\$4,478,598	\$4,569,768	\$5,491,878	\$5,226,565
25% to Remaining Counties and Municipalities	\$1,492,876	\$1,523,244	\$1,830,639	\$1,742,188
Total	\$59,714,740	\$60,930,120	\$73,225,170	\$69,687,530

* Values were back calculated.

Source: (61)

Worker's Compensation Debt Reduction Act Tax

West Virginia also imposes a Worker's Compensation Debt Reduction Act tax that charges \$0.47 per MCF of natural gas (10). The revenue from the Worker's Compensation Debt Reduction Act tax is deposited in the Worker's Compensation Old Fund (10).

General Transportation Revenue and Appropriations

West Virginia imposes a 20.5 cent per gallon tax on gasoline and diesel fuel in the state (62). The revenue from the motor fuel tax is deposited in the State Road Fund, which serves as a funding source for state highway construction costs. The State Road Fund may be used for the following purposes: construction, reconstruction, maintenance, and repair of highways; matching of federal funds available for highway purposes; and payment of the interest and sinking fund obligations on state bonds issued for highway purposes (63). Table 30 discloses the estimated revenue collections for the State Road Fund in West Virginia.

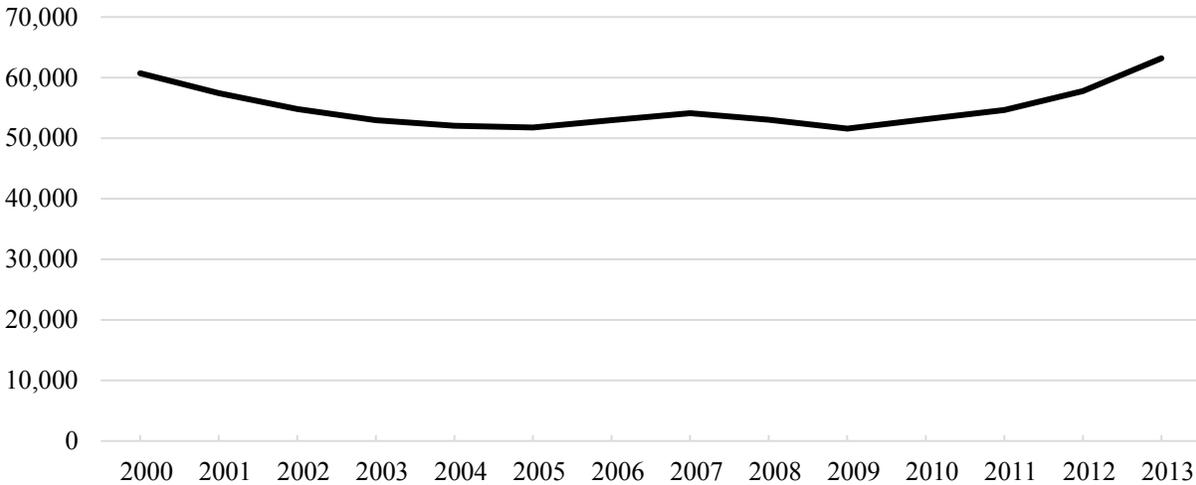
Table 30. West Virginia State Road Fund Estimated Revenue Collections.

Year	FY 2011	FY 2012	FY 2013
Registration Fees	\$88,995,000	\$88,988,000	\$92,787,000
Sales Tax	\$155,492,000	\$151,114,000	\$174,014,000
Motor Fuel Tax	\$380,000,000	\$380,700,000	\$410,000,000
Highway Litter Control Fund	\$1,699,000	\$1,680,000	\$1,755,000
Total	\$626,186,000	\$622,482,000	\$678,556,000

Source: (64)

Wyoming

Wyoming is a significant energy-producing state for both crude oil and wind energy. The state overlies three shale formations: the Mowry in the northeast, the Niobrara in the northeast and southeast, and the Hilliard-Baxter Mancos in the southwest. Wyoming crude oil production increased moderately from around 148,000 annual average BPD in 2007 to around 158,000 annual average BPD in 2012. Figure 11 shows the annual levels of crude oil production from 2000 to 2013, totaling more than 63 million barrels of oil altogether in 2013.



Source data: (11)

Figure 11. Wyoming Total Annual Crude Oil Production (Thousands of Barrels).

Wyoming ranked 12th nationally in wind energy with 960 utility grade turbines as of 2013 (13). The number of active gas wells in Wyoming decreased by an average of around 1,000 wells per year between 2007 and 2012, based on analysis of EIA data.

According to the Petroleum Association of Wyoming, Wyoming’s petroleum industry employed over 25,000 people, with payrolls over \$1.4 billion in 2012 (65). Contributions to state and local governments totaled \$2.2 billion, including property taxes, severance taxes, federal royalties, federal lease revenues, state royalties, sales and use taxes, and a conservation mill levy. In 2010, over 21,000 people were employed, with industry payrolls over \$1.1 billion and \$1.9 billion in state and local revenues, respectively (66).

Energy Development Revenue and Appropriations

Severance Tax

The State of Wyoming imposes a 6 percent tax on the gross value of oil and natural gas and a 4 percent tax on stripper oil extractions (10, 67). Table 31 lists revenues from the severance tax for FY 2012 and 2013.

Table 31. Wyoming Revenue from Severance Tax.

Source	2012	2013
Crude Oil	\$232,891,343	\$253,799,879
Natural Gas	\$431,448,628	\$268,239,476
Total	\$664,339,971	\$522,039,355

Sources: (9, 68)

The State of Wyoming also collects severance taxes on bentonite, clay, coal, decorative stone, granite ballast, gypsum, leonardite, limestone, sand and gravel, moss rock, trona, uranium, and gold, which all contribute to severance tax funds. These minerals are all taxed at a rate of

2 percent of extractions with the exception of trona (4 percent), uranium (4 percent), underground coal (3.75 percent), and surface coal (7 percent) (67). Table 32 lists the distributions of revenues from Wyoming severance taxes.

Table 32. Wyoming Severance Tax Fund Distributions in 2013.

Account	Amount	Percentage of Total*
State General Fund	\$221,571,370	26.1%
Budget Reserve	\$233,468,838	27.5%
Permanent Wyoming Mineral Trust Fund	\$323,985,415	38.2%
Water Development Funds I, II, and III	\$23,327,500	2.8%
Highway Fund	\$6,711,500	0.8%
Cities and Towns	\$14,337,500	1.7%
Counties	\$6,014,000	0.7%
Capital Construction Account	\$3,611,500	0.4%
State Aid County Roads (Road Construction)	\$4,495,000	0.5%
Other Misc. Non-transportation Accounts	\$10,644,267	1.3%
Total	\$848,166,890	100.0%

*While these numbers present the breakdown of numbers as presented, the National Conference of State Legislatures says the breakdown should follow a significantly different percentage.

Source: (9)

Oil and Gas Conservation Fee

Wyoming also charges an oil and gas conservation fee of up to 8/10 of a mill (\$0.0008) of oil and gas market value (10). The revenue from the oil and gas conservation fee is credited to the Oil and Gas Conservation Commission (10).

General Transportation Revenue and Appropriations

The State of Wyoming funds transportation projects through funds from fuel taxes, car registration fees, and driver’s license fees, among other sources. Wyoming imposes a 24 cent per gallon tax on diesel and gasoline fuels, which officials anticipate will result in \$120,485,070 in taxes for FY 2014 (69). Table 33 through Table 35 give an overview of the distribution of motor fuel taxes, the Wyoming Department of Transportation’s (WYDOT’s) overall budget, and allocation of funding for local projects from WYDOT, respectively.

In addition to allocations to local governments from motor fuel tax collections, WYDOT appropriates funding from its own budget to local governments, as shown in Table 35.

Table 33. Projected Wyoming Motor Fuel Allocations for FY 2015.

Category	Amount	Percentage of Motor Fuel Collections
WYDOT	\$109,342,431	67.24%
Counties	\$37,838,798	23.27%
Municipalities	\$15,436,046	9.49%
Total	\$162,617,275	100.00%

Source: (69)

Table 34. Total WYDOT Budget Based on Anticipated Revenue for FY 2014.

Source of Funding	Amount	Percent of Budget
Federal Aid	\$292,459,965	46.64%
General Funds	\$33,325,815	5.31%
Severance Taxes	\$6,711,500	1.07%
Other	\$28,218,394	4.50%
Fuel Taxes	\$120,485,070	19.21%
Registrations	\$61,745,811	9.84%
Driver's Licenses	\$4,348,583	0.69%
Vehicle Fees	\$13,419,715	2.14%
Royalties	\$66,472,500	10.60%
Total	\$627,187,353	100.00%

Source: (69)

Table 35. Transportation Funding Available to Cities and Counties from WYDOT Budget.

Category	FY 2012	FY 2013	FY 2014 (Projected)
Roads and Highways	\$27,429,206	\$23,093,153	\$24,305,117
Airports	\$29,815,870	\$35,579,277	\$35,448,497
Mass Transit	\$11,708,529	\$21,421,344	\$13,824,024
Total	\$68,953,605	\$80,093,774	\$73,577,638

Source: (69)

Section 3: Energy Development Impacts on Roadways

Our oil development is in the western part of our state... There are 13 counties that have or had oil production, but it's the four big ones that produce the bulk of the oil right at the center of the Bakken... There is a lot of impact to infrastructure, roads, schools, police, and public safety. (North Dakota).

Generally speaking, relationships between energy development, society, and government involve positive (benefit) and negative (cost) tradeoffs. For transportation, most of the direct impacts of energy development are negative. Increased heavy-truck traffic can rapidly degrade road and bridge infrastructures, resulting in lower levels of service and/or increased maintenance and preservation costs, and it also affects public safety and the environment. In specific circumstances, energy development can also have mitigating impacts on transportation, such as when energy companies maintain and rehabilitate roads and bridges as part of cooperative agreements.

TTI spoke with state DOT officials about their experiences with the impacts of energy development on state-maintained roads. The impacts include:

- Traffic:
 - The impacts of energy development on roadways and bridges stem primarily from the increases in traffic, particularly from heavy truck traffic but also from service and private vehicles.
 - Impacts are greatest on rural roads that were historically low volume, but can also affect all state-maintained roadways, including U.S. and interstate highways. In addition, impacts on locally maintained roads (e.g., county, township, and municipal roads) can be even more extensive given their structural characteristics.
 - While there is a wide range of energy development and resource extraction activity, it is truck traffic associated with fracking water (supply and disposal) that is the most intensive.
 - All heavy trucks have substantially greater impacts on pavements than passenger vehicles, but three- and four-axle single-chassis (straight) trucks, such as short-wheelbase dump trucks and water tanker trucks, have especially major impacts.
 - Traffic is not strictly confined to well development but is also due to related business activities (energy services and ancillary businesses) that impact state roadways.

- Infrastructure:
 - The increase in truck traffic, including trucks that are legally permitted for overweight/oversize loads, damages pavements and decreases their service life, sometimes virtually instantaneously.
 - Commonly observed roadway damage includes rutting, cracking, and damage to edges of narrow rural roads. While these conditions may be confined to only the surface of the road, frequently they indicate more severe damage to the roadway structure that is more costly to repair.
 - Some heavy-truck operators are illegally operating with overweight/oversize loads, which can exponentially accelerate pavement damage.
- Finance:
 - Increased truck traffic due to energy development activity increases costs of roadway maintenance and repair, not only due to roadway damage but also due to inflation in materials and labor costs.
 - In states where additional funding has been allocated to state DOTs, upgrades to energy-impacted roadways are often handled under capital improvement programs because enhanced funding has been provided to DOTs for new construction. Fewer funding increases (if any) are provided for maintenance and rehabilitation. This limits the measures that DOTs can take to preserve energy impacted roadways
 - DOT officials had difficulty quantifying the financial impacts of energy development at the district or statewide level.
- Safety:
 - Energy development traffic increases traffic congestion, creating conflicts with other vehicles and resulting in delays to the traveling public, increased accidents, and other traffic safety problems.
 - Both energy development workers and community residents may engage in unsafe behaviors such as aggressive driving, driving under the influence of alcohol or drugs, or failure to wear seat belts, resulting in increased traffic incident injuries and fatalities.
- Environmental:
 - Some environmental impacts from both intended and unintended pollution also occur.

The sections below discuss these types of impacts in greater detail, based on researchers' interviews with state DOT officials. Researchers draw directly from interview transcriptions, which were modified slightly to provide greater readability or linkages of concepts.

Traffic

The impacts of energy development on roadways and bridges stem primarily from the increases in traffic, particularly from heavy trucks but also from service and private vehicles. In some states, DOT officials observed dramatic increases in the levels of heavy-truck traffic and/or proportion of overall traffic that is heavy trucks. Truck traffic increases include oversize/overweight loads, which require special consideration for roadway maintenance and traffic management. DOT officials commented:

[In 2008,] we started seeing an expansion in gas exploration, and it kind of exploded in 2010 when the activity was phenomenal. We were seeing a lot of well development occurring. We saw traffic growing ten-fold, specifically truck traffic. (Pennsylvania)

We have seen an increase in oversize loads. Now that has leveled off too, but in 2010 we went from about 3,000 oversize permits to around 7,000 in a year. There were some really odd swings in [our] workload and different activities. (Pennsylvania)

It is not so much a change in traffic count that we notice ... The percentage [of trucks] is what really changes. I would say the actual average daily traffic doesn't change drastically, but the percentage of trucks, heavy trucks, goes up a lot. (Oklahoma)

They have given us some numbers on wells...and you're looking at 10,000 or 15,000 truck trips, a lot of times, to a well site [which will typically include multiple wells]...between their fracturing, their watering, all that kind of stuff. Generally, I think the lowest number they have given us has been about 5,000 trips. (West Virginia)

Some of our roads have gone from a couple hundred trucks a day to well over a couple thousand because of energy development. (Wyoming)

Impacts are greatest on rural roads that were historically low volume, but truck traffic affects all roadways, including U.S. and interstate highways. In addition, impacts on locally maintained roads (e.g., county, township, and municipal roads) can be even more extensive given their structural characteristics. DOT officials commented:

We are seeing impacts on all levels of roadways. Because some of the roadways where we're seeing oil and gas development were built back in the '50s, and they were more of a farm-to-market roadway where we didn't have to do a lot of work, you didn't need a lot of [roadway] structure to carry the loads. And now with what the oil industry brings with water trucks and oil trucks, we're seeing impacts all the way through the whole system. (North Dakota)

The petroleum-related activity has increased in the last four to five years and...in those areas, I'm sure they are drilling in different locations, but they are still using all of the

state highways to get there, in both directions. So, we haven't seen any slowdown there or any change really in which highways they are using. (Oklahoma)

There are some areas where we have seen truck traffic increase exponentially. And they all start from the interstates, and they go off the interstates to their particular destination...onto the traffic route and then from the traffic route onto the four-digit state road. (Pennsylvania)

For the most part our policy initiatives don't deal with the state highways themselves or the U.S. highways...and they do damage to them... It's so hard to isolate them as the cause of damage on a lot of the roads like that, and that has been a problem for us. (West Virginia)

The reality is on our state highways, we see a great increase in work trucks but not so much of all these water haulers and everything else. Those are actually running up and down the county roads. So, we are seeing a bigger impact off of the state system and not so much on the state system, although it eventually funnels on, and we have to react to that. (Wyoming)

While there is a wide range of energy development and resource extraction activity, it is truck traffic associated with fracking water (supply and disposal) that is the most intensive, especially for rural roads. Current horizontal well operations may have two to eight wells per well pad, with fracking of each well requiring hundreds of thousands to millions of gallons of fresh water, a significant percentage of which must also be removed from the site as wastewater. With water truck capacities between 3,000 and 9,000 gallons (depending on truck configuration), fracking operations often require several hundred to over a thousand water trucks per well on a daily basis. DOT officials commented:

When they are getting ready to frack a well, it is just water truck after water truck after water truck, so it is continuous. And then it is tough on the local roads, and ours. (North Dakota)

They'll come in and develop the site, and they'll bring the concrete to develop their six to eight-well pads. They'll put the retention ponds in, things like that, and that's pretty much like a standard... PennDOT's not worried too much about their site development. We look at that as a big box development, like a Home Depot or WalMart. It's not that big of a deal. It's when they start the fracking operation that you get a heavy influx of 1,300 trucks per day of water, and that just damages the roads. (Pennsylvania)

They are looking at 1 million to 2 million gallons of water per well. That is a lot of trucks. (West Virginia)

The roads weren't meant for the volume of traffic that is being generated. Like when they frack a well, they need so many million gallons of water to do the fracking and the sand and stuff. The roads weren't really meant for that volume of traffic. (West Virginia)

Heavy trucks have substantially greater impacts on pavements than passenger vehicles, but three- and four-axle single-chassis (straight) trucks, such as short-wheelbase dump trucks and water tanker trucks, have especially major impacts. Heavy trucks are not unique to the petroleum

industry but are also used widely in other natural resource and construction-related industries. DOT officials commented:

What I'm worried about is the triaxle truck, with two drive axles and a tag axle and steering axle, and it's a single truck, not a tractor-trailer. That truck itself impacts our roads 4.5 times what a tractor-trailer will, absolutely. A typical tractor-trailer has five axles. It spreads the weight out evenly and gives it a bigger footprint. That four-axle truck will only carry about 66,000 to 70,000 pounds total, but it's so compact that it bounces and basically breaks the road up a lot quicker... It's not just strictly for the Marcellus industry. We have those same vehicles for timber; we have coal trucks that are triaxle, so it's far-reaching. (Pennsylvania)

We have some tractor-trailers, but most of the trucks are triaxle frames retrofitted to carry water tanks. There are so many of them now that it is just amazing. But those are the ones that cause us the most concern. And they do the most damage, quite honestly. (Pennsylvania)

The water truck is the biggest thing, probably. When they go into the fracture operations, hauling the water in is what really does the big damage to us. Their rigs are pretty big, but they break them down a lot, and they bring them in. A single load usually doesn't create a big deal for us, except for the bridge structures and things like that, but I think if you had to say one item [that impacts roads the most], that was probably it: the water trucks first and probably the fracture trucks second. (West Virginia)

Impacts on DOTs result not only from heavy-truck traffic and other truck traffic (e.g., service vehicles and passenger vehicle traffic from workers) for well development and operations, but also related activities that impact state roadways. A DOT official commented:

We have another oil-field-related business—They produce tanks at a manufacturing plant on one side of the highway and have a storage yard on the other side of the highway. They have a lot of traffic going in and out picking up their products, and they also have a lot of traffic crossing the highway to their storage yard. So we are faced with a number of oil-field-related traffic issues. (Oklahoma)

Infrastructure

Researchers asked state DOT officials about how energy development truck traffic was impacting roadways. Almost universally, DOT officials indicated that where significant increases in truck traffic occur, including trucks that are legally permitted for overweight/oversize loads, roadways are impacted by damage to pavements resulting in decreased roadway service life. In areas where energy development activity is especially intensive and roadways are historically low volume with less structure, damage can occur virtually overnight. Impacts can be especially problematic in climates that have spring and fall freeze-thaw cycles. DOT officials commented:

We see damage throughout the entire year. A lot of very heavy trucks are on these highways that are built for low volumes, for not many cars and residential areas. They bring a lot of these big trucks, and it damages the pavement. But we see extreme damage

during the freeze-thaw cycles... When the ground starts thawing, it gets extremely soft, and a lot of the energy traffic is heavy trucks, so when they're traveling on these low-volume roads that are thin sections to begin with and it's thawing, they damage the road significantly. They leave huge ruts in the pavement, and that's something we learned the hard way. (Colorado)

We've been seeing a lot more rutting in some areas than what we've had before and seeing some pavements breaking up where they've been around for quite some time. It is due to the truck traffic because of the loads. The roads weren't designed to handle that many trucks. And the weather plays a factor because we get in those freeze-thaw cycles. And then the spring load restrictions are always a challenge because the subgrade is so soft. (North Dakota)

The truck traffic increases overnight, and for a period of time while they are drilling a well and then they leave, that road experiences 20 years' worth of increase in truck traffic in three months. So the damage is still there for us to fix or them to fix. (Pennsylvania)

We all know that when there are additional axle loads on pavements and bridges, they deteriorate faster. Where we were maybe seeing a 12- to 14-year service life on a pavement, we are seeing that shortened to anywhere from 10 to 11 years. (Pennsylvania)

Commonly observed roadway damage includes rutting, cracking, and damage to edges of narrow rural roads. Sometimes damage may be confined to only the surface of the road, but on many roads, especially historically lower-volume roads with limited structural strength, the damage is often much more severe, impacting through the depth of the roadway structure and requiring more costly rehabilitation or reconstruction. DOT officials commented:

We see severe rutting, breakdown, and fatigue of pavement structure and increased accidents on low-volume roads. A lot of our low-volume roads have turned into medium- to high-volume roads, and they're not designed for it, and not in the safety aspect either. (Colorado)

Last year when we looked at [a state highway] it needed some repair work, but now when we look at it again we're experiencing 1-inch rutting, which is very unusual for that area, except there is a lot of oil activity. So what we have decided to do is correct the problem, and the state of Kansas is paying for the repair work. We monitor the oil and gas traffic, and so far we've been able to correct all the problems, and it's not widespread; it is limited to small areas. But they are moving north, and I don't know what's going to happen there. (Kansas)

[After the oil and gas boom started], we would start having base failures in the pavement. That's what winds up happening when the pavement reaches the end of its useful service life: the base begins to break down. And then there will be large ruts in the pavement or areas in the pavement that will push, and then alligator cracking. (Oklahoma)

Most of those roads don't have shoulders, and so the edge lines of the roads are failing. They are breaking away. And then, we're seeing a lot of base failures. (Oklahoma)

We had one of our roads up in [one of the state's counties] that just collapsed over one weekend. It was a "pie-crust road" that was tar and chip sealed, with probably about

½ inch of asphalt. The industry destroyed that over one weekend, and by the end of the weekend, one of our foremen was standing in wheel ruts up to his knees. The fracking operation kept going because they had a D9 dozer actually hooking a chain to a water truck and dragging it up over a hill so their operations would not be hindered. They were using our infrastructure to do that. I got calls from school districts; I got calls from first responders. They couldn't navigate on this road, and they said, "I'm going to take pictures, and I will show you. I will show you even with a four-wheel drive ATV you couldn't navigate on this road." And they weren't lying. (Pennsylvania)

A lot of our roads were originally 16 feet wide and have to be widened, 4 feet on each side, and we see a lot of that widening giving way. (Pennsylvania)

What we are seeing is having to do a little more base repairs and earlier base repairs on the network that doesn't have a weight restriction on it, which is subject to a lot of truck traffic. (Pennsylvania)

Some heavy trucks are illegally operating with overweight/oversize loads. Since impacts on road pavements are exponentially related to axle weights, even one severely overweight truck can significantly damage a road or bridge. Generally state DOTs rely on other agencies such as state highway patrol and local agencies with license and weight authorized personnel for enforcing overweight/oversize loads (Wyoming has its state police/highway patrol as part of the DOT). In some states, DOT officials observed that smaller trucking companies tended to be out of compliance with truck size/weight rules; others noted that it was across the spectrum of company sizes. DOT officials commented:

In this one location I remember looking at the weigh-in-motion data and seeing we had this one heavy truck coming across. So one night we set up a sting and caught a triple bottom [a type of truck typically used for hauling frack sand] that was lost. But the big one was an oil tanker, who was just taking advantage of it being 1 a.m. and nobody being out there. (Kansas)

It only takes one or two really overloaded trucks to take a road out because the weight damage is exponential. When you get much over legal loads, it doesn't take too many of those trucks to take the roads out... There are road sections where our old sections weren't designed for the number of trucks to start with, and so they are shortening the life. Having some trucks that are way overloaded just shortens that life up even more. (North Dakota)

The bigger companies, big haulers, they are pretty good [about not running heavy or without an overweight permit]. They keep their folks in line. It's the contract haulers, the small companies, that try and make a buck, and save a trip. We are getting more truck [regulatory enforcement] out here all the time. The counties are getting truck regulatory to do weighing and stuff. But yes, there are abuses. (North Dakota)

Cranes are probably our biggest weight issue because of the multi-piece, the counter weights, the outrigger pads. There are a lot of things that they put on the factory that by our regulations you just can't go down the road with... And that seems to be a training and educational issue. We get some companies that get on board, and then a new crane company pops up, and you are starting all over. (Wyoming)

As discussed under traffic impacts, ancillary oil and gas activities (e.g., midstream operations) can also have some impacts on roadway infrastructure, particularly for issuing of permits for activities such as crossing roadways by pipelines, and right-of-way maintenance. DOT officials commented:

We weren't prepared for the amount of pipelines that we ended up having to permit for borings and crossings [of the roadway and right of way] because then it was several years after the wells started being drilled. That aspect of the whole process started hitting hard, maybe several years ago. There were several hundred miles of gas lines that were being laid by our industry, and we were like "Wow." (Pennsylvania)

It's just amazing all of the different facilities they are building out here—I mean, just all kinds of different compressor stations, pipelines. They are just spending millions and millions of dollars, and it's just amazing. They will cut down tops of mountains to build compressor stations on, and run hundreds of miles of pipeline here and there and everything. (West Virginia)

Finance

Researchers asked state DOT officials about financial aspects of energy development roadway impacts. Some officials were able to cite specific examples of project costs associated with rehabilitating energy-impacted roads. In general, DOT officials indicated that increased truck traffic due to energy development activity has resulted in increased costs of roadway maintenance and repair. This is not only due to increased damage but also due to increased materials and labor costs, which have increased in energy development areas, sometimes dramatically. These increases have made it difficult for DOTs to accurately budget and plan for roadway maintenance and repair projects. DOT officials commented:

What has happened to us in western North Dakota here, it is an area of the state that is short on aggregate, it is short on manpower, and it is short on housing... Housing is really short out here. And so the cost of doing business out here for the contractors—with lack of housing, lack of local manpower, and the high cost of materials—has driven their price up considerably. It is much more expensive for us to work in this part of the state than in the rest of the state. Those costs have gone up over the last few years quicker than we had anticipated, so we weren't able to get our full programs done because we were out of money. We've been increasing our estimates, so we get a little more accurate on that. [The legislature has] been funding us at the level that we think we can get it done. And with the increased cost of doing everything out here, sometimes we don't get all our projects done that we had anticipated. (North Dakota)

[On financial impacts for addressing energy impacts on state roads in one of a district's counties:] We probably did somewhere in the neighborhood of \$5 million worth of maintenance overlays there, and in additional asphalt that we gave to that county, over a couple of years... Probably what I had originally planned for that two-year period of time was about \$1 million, in that neighborhood—it would take some research to go back and figure it out; this is just all off the top of my head. I would say we were going to do \$1 million of work in that two-year period of time. And we wound up doing \$5 million worth of work. (Oklahoma)

The cost of asphalt has gone up considerably in the last five years, and it seems like every time we get an advance in one area, then there is something else that keeps us from fully taking advantage of the situation. (Oklahoma)

We have added additional personnel in oil and gas areas to provide guidance and track the activities, but we often find it difficult to obtain and retain qualified personnel for the task. In addition, we have seen a significant loss of our own internal personnel to the industry. It is currently difficult to keep our equipment operators, engineers, and technical personnel. The Division of Highways in West Virginia is not competitive on salaries and benefits with these large companies. Most of these operations are expected to last for 20 to 40 years. Depending upon the technology to develop additional shale layers, it could be longer. Many permanent and lasting jobs appear to be possible for long-term careers in these areas. (West Virginia)

Upgrades to energy-impacted roadways are sometimes handled under capital improvement programs because funding has been provided to some DOTs for new construction but not for maintenance and rehabilitation. Other DOTs indicated they have little additional resources for addressing energy impacts. DOT officials commented:

So far we're not going back to the oil industry; our policy is nothing like that. Our policy is let's try to fix it, make sure it's safe for the traveling public, but I don't know how long we can go on paying for the damages. The money comes out of our state funding for resurfacing. It comes out of our KDOT budget. We have not asked for any additional funding; we've been able to pay it out of the budget we have. (Kansas)

We're trying to hold our roads together. We're at a "maintain what we have" mentality, so we're just trying to hold our roadway system together. We don't have enough funding to widen our roads; we're not doing a lot of capacity improvement especially on low-volume roads, nor safety improvements like shoulders. If we go in and we can add another foot under the resurfacing program—according to the Federal Highway Administration, you can't add any width, you can get a good track line and go a foot outside the white line, but you can't do much more. (Colorado)

[Without additional funding from the state legislature,] we would have a lot of challenges [to meet roadway maintenance needs], that's for sure. We'd be moving dollars around all over the place, trying to keep up, and we probably wouldn't be doing certain types of projects where it is a reconstruction. We'd be more trying to preserve it and keep it going. (North Dakota)

Right now in terms of dollar amounts, those projects where we have to improve intersections or add a turning lane because of more traffic, those are higher-dollar projects that are actually funded under our capital program. Now we are seeing a need for more of those. Actually we kicked off a study last year on an intersection improvement just because of the general increase in traffic on two major traffic routes. We had to do something. (Pennsylvania)

I would say we are able to keep up maybe 70 to 80 percent [of the impacts on roadways]. Our roads are deteriorating. Our roads are not in as good of a shape as they were five years ago, as good as 10 years ago, or as good as 20 years ago. Of course, our construction funding has been flat, and inflation on the construction side has been killing

us. As far as maintenance goes, I'd say close to the same thing. We are not keeping up on both sides of the coin, maintenance or construction, and again, it varies from year to year, but maybe 70 to 80 percent of it, we are able to keep up with. But for sure I could say it is less than 100; we are not keeping up 100 percent. (Wyoming)

DOT officials also generally had difficulty quantifying the overall financial impacts of energy development on roadways at the district or statewide level. Some officials were able to provide a very general estimate of impacts:

It's a significant percentage of our material and our labor, I would say, in the summertime. We still have a lot of other things to do [in an urbanized area that is part of this district], but I would probably say 5 to 10 percent at least. I mean, it's hard for me [to estimate], we spend a lot on snow and ice. That takes up a lot of our budget in the wintertime, especially this winter, and then in the summer we are running tractors and mowing all the time. But I would say during the warmer part of the year when we can get asphalt, our maintenance guys in those counties, that is what they are concentrating on. They will lay asphalt all summer long as long as there is money available to buy it. It is hard to sit down and say a percentage. And 5 to 10 percent doesn't seem to be a lot maybe, out of the whole pot, and it may be higher than that, but when you consider the other activities that we do, it is probably a pretty big percentage. (Oklahoma)

I don't have a split [of financial impacts] off the top of my head, but I know there have been tradeoffs in it, and it is kind of difficult to assess right now. (Pennsylvania)

It's kind of hard to quantify the long-term damage done to roads over the years from heavy weight. You can certainly see the ones that were damaged right away, and especially this time of year, you can see the ruts in the road... It really varies from year to year. When there is an energy boom going on, you're going to have more energy impacts, and when a recession in the energy is taking place, you don't have so much of it. Right now I think North Dakota would say, "Holy cow, we are spending 50, 60, 70 percent of our budget due to energy." Their roads are in really poor shape, but they were impacted heavily all at once. (Wyoming)

In states such as Pennsylvania and West Virginia that have required companies to take responsibility for roadway repairs on the lower-level state roads (discussed further in Section 4), state DOTs have realized some cost mitigation to their operations due to private-sector road improvements. A DOT official commented:

We have estimated that the division has benefitted from construction and reconstruction projects over the last two to three years in the range of \$50 to \$75 million. In addition, one of the companies has begun the construction of a \$250 million water line from the Ohio River to the central part of West Virginia into Doddridge County. This is to reduce the number of trucks on the roads and to provide an adequate supply of water for their operations. It is our understanding that the line will be left in place to be utilized by the communities. These activities have for the most part been voluntary ventures in accordance with our policies. (West Virginia)

Safety

Energy development traffic also increases congestion, creating conflicts with other vehicles and resulting in increased accidents, delays to the traveling public, and other traffic safety problems.

DOT officials commented:

[The North Dakota Department of Transportation's biggest safety issue is] probably congestion, and it's a different mix of traffic because there are so many trucks mixed in with all the cars. So I think those are our biggest ones. It's congestion and the amount of traffic on the roadways. (North Dakota)

They also put in some large gas [compressor] stations... While they are building those, they are very intensive, both with people and equipment. And they might have, some of them, maybe 50 people driving in there every day to work when they are building these big compressor stations. And when you take a small rural two-lane highway out in the country and now you have just a long string of trucks going in and out of one location, every day, plus 50 employees going to work every day, you've really changed things. It created some traffic safety issues. (Oklahoma)

Sometimes [companies] will go and put in a driveway without a permit, so our people have to work with them that way, and [the companies] are not always putting them in a safe place, which is why we want them to have a permit. We can anticipate in the decision-making process where to put a driveway. (Oklahoma)

On some of the routes, we did a study looking at crashes involving large trucks. There was an increase, but on the other side of that, there was a general increase in truck traffic, so it was proportional to the increases we were seeing. Our traffic unit looked at that. They went through crash records, historic and current, and then did some comparisons with the traffic counts we were getting with those changes, and pulled the type of vehicle that was involved. (Pennsylvania)

Sometimes in these downtown areas that aren't very urban—they are communities but also out in rural settings—you have the speed of vehicles, platooning, driving too fast for conditions, stop signs. For instance when they are fracking, and they have 500 water trucks that they anticipate, they are going to come in platoons. We would require them to go out and have flaggers at these intersections and signs alerting traffic that you've got some trucks up ahead of you that might be stopping, coming to a stop, or making a turn, things of that nature. Those are the kinds of safety issues that we are dealing with. (Pennsylvania)

Anything overweight or oversize is a big concern, especially from a safety standpoint. They have big drilling equipment that they use. Those are oversize loads to begin with, but the biggest headache is, like what we were experiencing...the coal trucks, the triaxles that we have always experienced here. But now we have such a volume of water trucks, they've gone in their convoys and platoons, and it's just amazing. (Pennsylvania)

Some of our bigger complaints are the operations, and they tend to run in large groups when they are [operating]...particularly for fracturing trucks and things like that. They are on small roads. They don't have a lot of room to get off the road, and for a while they were just taking the road and crowding people over, and they had to sit and wait for them all to get through... We were hearing both from the legislature and from the people out

there—and there were just a few of them—but to be honest with you, they pretty much just disregarded the people at that time and did what they wanted to do. Like at certain times, they would be going up the road with a truck, and they would get across the road and get the road blocked, and a school bus would be coming at the same time, and sometimes the kids would have to sit two or three hours before they could get the road open for them to travel through. (West Virginia)

We don't have that many individual accidents between the gas companies and the citizens and things like that. Most have been inconveniences, where they try to go up a road and you've got a curve, a pretty stiff curve, and they get stuck in the curve and block that road. (West Virginia)

We started seeing a trend of equipment and driver violations dealing with driving, hours of service rules, and a lot of equipment problems. Some of those we felt—and that may be a little opinionated—it's a trend we are seeing around the country, that due to the rough areas and the lack of improved roads where they are operating, it's a little harder on equipment, and some of those companies' maintenance sections weren't keeping up with that. Hours of service, they were just trying to get as much done as they could because of the push, the boom... It wasn't related to just the industry, the energy industry; it was across the board. We were just taking a tighter look at everything. (Wyoming)

We probably see our biggest driver violations in what we call hotshot rigs, dually pickups essentially pulling big trailers. Because they don't think they are a big truck, that's where our driver hours of service violations are, probably the biggest number of them. But as far as equipment goes, it would be drop-deck trailers behind a straight power unit or what we call a winch truck. Those would be where our biggest equipment violations come in. (Wyoming)

Both energy development workers and community residents may engage in unsafe behaviors such as aggressive driving, driving under the influence of alcohol or drugs, or failure to wear seat belts, resulting in increased traffic incident injuries and fatalities. DOT officials commented:

We find that a lot of our accidents are alcohol related, with no seat belts, probably the 20- to 30-year-olds in a lot of cases. It happens to other people too, but a lot of them are either alcohol related or no seat belts, or both. Some are just errors in judgment, when to pass a vehicle. And a lot of them are on local roads also, not just necessarily state highways. (North Dakota)

When you sit there and you say, "All of these fatalities are tied with one oilfield, and the surprising number of [them are] drinking while driving, and they all were happening right around this one intersection," you are just saying, "Come on, workplace, you've got to help us out here. Tell them not to drink beer until they get home." It is a little bit more of a risk-taking demographic. (Wyoming)

Environmental

DOT officials were also asked about environmental transportation impacts from both intended and unintended pollution from heavy trucks working in energy development. While many officials had heard of intentional acts such as illegally dumping wastewater, only a few indicated

specific examples. Occasional unintentional releases of materials from trucks associated with energy development activity were more frequently noted. DOT officials commented:

We've caught a few truckers with their valves open. They basically lost their company at that point because of the fines... So we do catch some. They are hard to catch obviously because there are a lot of roads out there... They typically do that on a local road... [On state roads,] occasionally you'll be driving down the road in the winter time, and you see these little ice patches and say, "What's going on there?" They just forgot to shut their valve all the way off or close it, so it's kind of dribbling; it's not pouring out. (North Dakota)

I've heard the rumors that happens, but I've not heard any of my people say they are aware of it. At least, not on purpose. They've had oil trucks from the asphalt plant. They back up and break a nozzle or something, and they leave a trail of oil for 20 miles, but it just looks bad. It doesn't cause any...problems. (Oklahoma)

I'm not necessarily aware of those. The ones we've seen appear to be more accidental like they were actually hauling the lubricant used for drilling, and it leaked on the road one Friday afternoon for about a good 20 miles and...it essentially made the road an ice skating rink in fall. (Pennsylvania)

I don't think we've had any of that. There was one incident, up near the Clarksburg area, that they claimed was leaking. But we have not really experienced that. Now, we've got disposal sites here and things like that, and some of the actual water treatment plants took them for a while, but there has been less and less of that. They are a little more reluctant to take the wastewater. And they do recycle some of it. (West Virginia)

The large majority of state roadways are paved, so roadway dust control is less of a concern on these roads, but some DOT officials noted impacts on local (e.g., county) unpaved roads that are not under their jurisdiction:

As far as environmental issues, such as dust control, the counties work together with what we call our LTAP [Local Technical Assistance Program] folks, our local transportation advisory group that comes out and shows them different things they can do to keep the dust down, stuff like that. So we do work together. Our roads are all paved on the state system, so dust is not an issue, but on the county roads it is... If there's an accident or something like that, the DOT comes out and helps barricade off the road and do traffic control, stuff like that, but typically we don't get involved in the environmental side. (North Dakota)

Summary

State DOT officials indicated that energy development activity can result in dramatic increases in truck traffic, particularly in localized or regional areas where intensive activity is taking place. Traffic increases can result in significant roadway damages, particularly on historically low-volume roadways that were not engineered and were constructed with limited structural support. However, quantifying the financial impacts on regional and statewide levels was typically difficult for our interviewees. They indicated that traffic increases also result in greater

congestion and conflicts with the traveling public, creating safety issues. Some environmental impacts were noted but were generally limited.

The West Virginia Division of Highways, part of the West Virginia Department of Transportation, provided a list of oil and gas development issues that they encounter. Rather than parsing the list out into the previous subsections, it is retained in its original order as follows to provide an additional perspective on the variety of issues that state DOTs are encountering with energy development traffic:

Oil & Gas Highway Issues

- Damaging state infrastructure (guardrail, bridge parapets, culverts, signs) and leaving unreported.
- Unloading equipment on highways.
- Cutting the toe of a slope, creating slips.
- Running waterlines in ditches and through culverts.
- Unloading equipment in the turns of roads with no flagmen.
- Placing extensions on state culvert pipes.
- Tracking materials (mud, dirt, and stone) onto highways.
- Building road entrances without proper entrance permits.
- Hauling improper oversized loads.
- Having no permits.
- False permits (i.e., stopping the permit before a bridge and then crossing the bridge with an overweight load).
- Open-cutting roads for waterlines without permits.
- Contracted trucks hauling stone mashing out ditches and the road.
- Equipment and large truck volume destroying road surfaces and bases.
- Placing large jagged stones on the highway, causing damage to car tires and undercarriages of vehicles.
- Not staying on bonded sections of roads.
- Routes impassable in winter months due to damage.
- Mashing out asphalt pavement and tar and chip roads due to heavy loads and traffic volume.
- Dust issues.
- Broken shoulders.
- Hitting and destroying roadway signage.
- Companies installing their own signs on state right of way.
- Safety issues:
 - Speeding.
 - Trucks hitting school buses.
 - Trucks running local residents off the road into ditches.

- Pilot trucks driving on the wrong side of the road.
- Traffic control issues:
 - Improper signs placed.
 - Poor maintenance of signs.
 - Signs not placed/removed in a timely manner.
 - Improper flagging procedures.
- Not obeying signs (roads not suitable for large trucks).

Section 4: State DOT Policies and Programs for Addressing Energy Development Impacts

While many of these [issues we are facing] have both good and negative aspects, we believe the overall benefits to the state and to the nation will be very good after the adjustments and growing pains have taken place. It will continue to require changes for all parties. (West Virginia)

This section considers policies and programs that state DOTs use for addressing the impacts of energy development on roadways. Policies and programs are characterized in this context as formal, strategic initiatives that states and state DOTs use to focus their efforts. The following is a summary of the four broad categories of these policies and programs:

- Traffic restrictions (road and bridge posting):
 - Vehicle load restrictions are a common state DOT policy, primarily posting of weight limits on lower-level state roads and bridges that have limited structural strength.
 - For roadways, restrictions are especially used by states whose roads are subject to freeze-thaw cycles, where partially frozen ground conditions make roads at great risk for roadway damages.
 - For bridges, restrictions are used by states to preserve the structural safety by enforcing the design loads. The restrictions are a precaution on deteriorated or old bridges, and also a means to curtail repairs.
- Road bonding and/or maintenance agreements:
 - Road bonding agreements require the primary users of roadways to sign contracts that they will maintain roadways to specified (typically preexisting) conditions, and post a bond that will help cover the costs of roadway repairs should users fail to meet their obligations. State DOT applications generally limit road bonding to lower-level state roads since the number of different users on higher-level roads (e.g., state, U.S., or interstate highways) precludes contracting with only one or a few responsible entities.
 - TTI found that two of the eight DOTs researchers spoke with widely used bonding on state roads. In Pennsylvania, posting of road weight restrictions and bonding are part of a Posted and Bonded Roads program. West Virginia uses road bonding agreements as well. Examples of contracts and other documents used in these programs are included in Appendices B and C for Pennsylvania and Appendix D for West Virginia.

- Other states covered in this study report generally not using bonding programs or maintenance agreements for oil and gas energy development on state roads, although some use of these types of arrangements was noted for non-state (e.g., county) roads.
- Industry engagement:
 - Of the eight state DOTs that were interviewed, only Pennsylvania reported having a formal, high-level effort for engaging with oil and gas well developers through the Governor's Marcellus Shale Advisory Commission. PennDOT also holds regular meetings with the Marcellus Shale Coalition, an industry trade group. PennDOT officials consider industry engagement to be very important to their ability to learn about industry activities and plans, which they use to address road infrastructure and preservation needs.
 - Other state DOTs have a lower degree of interaction with oil and gas development companies. They tend to learn about industry activities and plans indirectly via other state agencies that regulate energy resources. This practice is covered in Section 5 of this report.
 - Some state DOTs identified interactions and discussions with oil- and gas-affiliated industries (e.g., midstream companies) regarding their plans and activities. This was generally in the context of permitting requirements (e.g., for driveways and road crossings).
- Roadway funding:
 - Two states, Pennsylvania and North Dakota, have major transportation funding initiatives that represent significant increases to state DOTs over previous funding levels. Other state DOTs reported little to no substantive changes to their budgets in recent years.
 - In Pennsylvania, passage of Act 89 in 2013 resulted in increased transportation funding for PennDOT. While not specifically intended to address energy development impacts, some of the funding will be used to address roadways impacted by industry traffic, including energy development.
 - In North Dakota, the state legislature has substantially increased DOT funding to enhance energy-impacted roadways and improve transportation infrastructure statewide.

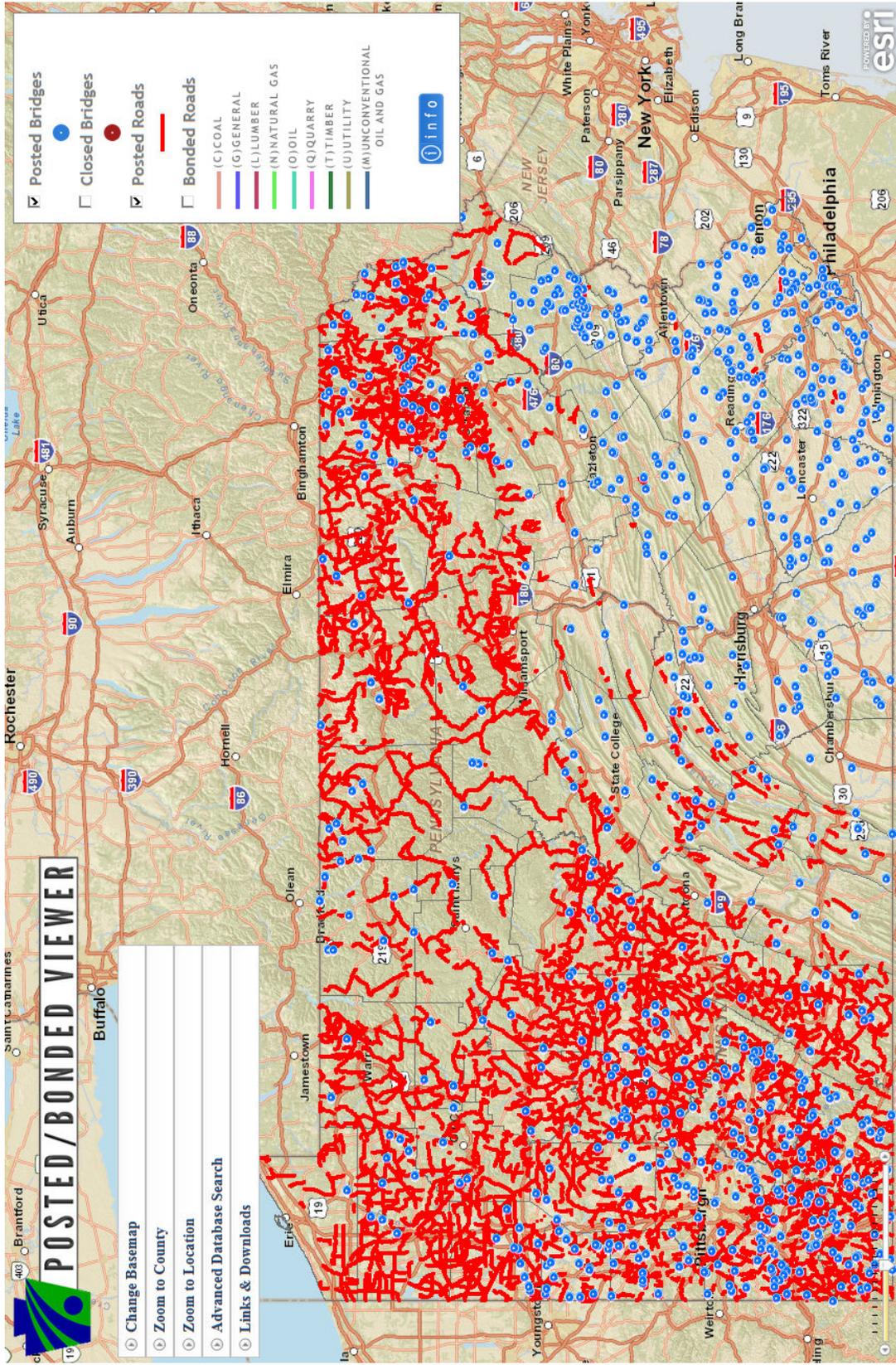
Traffic Restrictions (Road and Bridge Posting)

Vehicle load restrictions, primarily posting of weight limits on lower-level state roads and bridges that have limited structural strength, are a common state DOT policy. For roadways, they are especially used by states whose roads are subject to freeze-thaw cycles, where partially frozen ground conditions make roads at great risk for damage due to heavy vehicles. The load restrictions can significantly reduce the allowable vehicle weights from standard weight restrictions on major state, U.S., or interstate highways (e.g., 40 tons or 80,000 lb) to a much lower value. DOT officials commented:

We put load restrictions on our roads every year, and it depends on how they are holding up. I've seen [the restrictions] as low as 6 tons. Maybe we've had a few 5 tons, but mostly it's 7 and 8 tons. But if [the road] starts falling apart, we'll restrict it even more until we get that frost out of the ground, and get that subgrade and some strength back... Our districts are over many counties. It's not county by county, and neither are those load restrictions county by county. It's over the system. It might be district by district, but usually there's a point, like the interstate highway and south. That is where we break out the load restriction, or not, because of the frost, and usually the frost comes out from south to north, so you'll see the load restrictions come off from south to north also. (North Dakota)

Most of our weight limits are out there at 10 to 15 tons, 12 months a year. Some are seasonal. We do not encourage traveling over our spring thaw period... [The ground] just freezes. It doesn't take much to disrupt our infrastructure during that freeze-thaw period because up here we get water underneath the pavement. It basically separates it, so it just [de]laminates, or it just pops, in some cases just blows up the road. It looks like a bomb went off. But that is due to any type of heavy-hauling activity. It doesn't matter if it is water [for energy development fracking] or not...so we try to discourage that. (Pennsylvania)

Figure 12 is a map illustrating posted roads in Pennsylvania.



Source: (70)

Figure 12. Posted Roads in Pennsylvania.

Road Bonding

Road bonding agreements require the primary users of roadways to sign contracts that they will maintain roadways to specified, typically preexisting, conditions, and post a bond that will help cover the costs of roadway repairs should users fail to meet their obligations. For state DOT applications, it is generally limited to lower-level state roads since the number of different users on higher-level roads (e.g., state, U.S., or interstate highways) precludes contracting with only one or a few responsible entities. A DOT official commented:

The West Virginia DOT is one of four states that have all of the county routes, all of the state routes, and all the U.S. routes... If you go to ODOT or PennDOT, the state maintains certain routes, and a separate government agency actually owns the county route, and then the townships have their routes. The way our policies are written, if it's a West Virginia route or a U.S. route, we do not require the oil and gas companies to bond those routes, but if they are on a route that is designated as a county route, it has to be bonded. (West Virginia)

Researchers found widespread use of road bonding by two of the eight state DOTs interviewed. In Pennsylvania, posting of road weight restrictions and bonding are part of a Posted and Bonded Roads program. Figure 13 is a map illustrating bonded roads in Pennsylvania, and Appendix B contains information about the process for bonding a posted road in Pennsylvania. West Virginia uses road bonding agreements as well. Examples of contracts and other documents used in these programs are included in Appendices C and D for Pennsylvania and West Virginia, respectively.

PennDOT officials described the historical precedent of working with other industries, such as coal and timber, on roadway bonding in the state going back several decades. With the dramatic increases in shale gas exploration, they described the need of working with energy industries throughout the state on road bonding and maintenance agreements as well. DOT officials commented:

What had happened with [DOT districts in the state], they weren't used to that [energy development] industry at all. We have always had a lot of coal mining, timber, and of course traditional gas wells, so we knew where we were with how we were going to protect our assets, through road bondings and issues of concern. But then it took a whole different level once the Marcellus industry was getting formulated, and there was a commission that was formed statewide that we all were a part of. And we had so many meetings with the industry up front, especially when we were putting new provisions in place. Because to go through bonding and posting procedures and excess maintenance agreements with these haulers and multiple haulers on various routes—it's been quite a production. (Pennsylvania)

Initially, you do things traditionally, maybe not necessarily with a handshake and a smile, but you know if you're dealing with a singular well drilling company on a singular well off the beaten path. But then, when you're dealing with a lot of them, we had to put some structure in place. Plus the fact that a lot of the other people already had the roads posted. For instance, you have other industries; they were getting blamed or pulled into the mix for the damage that was being done on the roadways... That was all part of the learning that we had to go through, earlier on. But that resulted in all the processes and procedures that are currently now in place statewide with regard to what we do in dealing with industry from our perspective, and also for municipalities when they have to deal with them from their perspective. Say a well doesn't necessarily impact a state road; we've been able to give a lot of guidance to the local municipalities and townships. (Pennsylvania)

PennDOT officials discussed aspects of the process such as excess maintenance agreements and what they entail from the DOT's perspective, including application of road bonding and maintenance agreements across industry sectors, not just specific to energy development:

We wanted to have what we call a Maintenance Plan. Along with our Excess Maintenance Agreement, to give you a permit and things, you have to tell us how you are going to manage all the excess maintenance. If you are a large corporation doing this, tell me who your contractor is, what contacts you have... You are going to maintain [the roads] to the integrity in which you found them, leave it as you found it. If that takes keeping an asphalt plant open all winter long, then that is what you're going to have to do; you're going to have to pay for that. And the industry did. They actually kept a couple of asphalt plants that traditionally closed during the winter. They had them stay open just to maintain their operations... The more heavy hauler you are, the more detail we want because you have more risk out there. If you're a mom and pop sawmill, you will have relatively minimal risk. But if you're a shale driller or water hauler, you're going to have a lot more risk out there, so we're going to want to know. You better have a better plan... They're all treated the same. It's just the size of their operation that makes the difference on what they need. (Pennsylvania)

Once we got to a point where we had so many gas wells being drilled, we had regional meetings... We would have all the major gas well drillers and companies there, and then we would explain to them, "OK, if you are there singularly or as part of other companies that are using the same road, here's the bill. You're going to put in an excess maintenance agreement, and you're going to develop that beforehand. You're going to let us know if you're going to use the road in the winter, and then here are the procedures that we would use to go out and inspect the road." And we have it in place that we would evaluate the road weekly, and then if there was a singular user or in the case of multiple users of that same road, if the damage has got to a point where we needed them fixed, we would just send them a letter and notify them these needed to be fixed by a certain date. But, if [the roads] were still bad enough that they needed to be fixed immediately we would give them a 5-day notice, saying that 'If you don't fix these roads in 5 days then we are going to revoke your permit, in your excess maintenance agreement.' ... So that has worked well. And there really hasn't been that much push-back from industry because it's in their best interest to keep the road serviceable. That was one of the things that helped us out greatly. (Pennsylvania)

Energy development is widespread across numerous DOT districts in Pennsylvania. PennDOT officials discussed the coordination of the Posted and Bonded Roads program between the agency's central offices and the districts:

The bonding and permitting process is centrally administered, and it's done with the intent that all the districts are consistent in enforcing it. And our folks talk a lot, our permit managers, those especially. There might be maybe six or seven of the engineering districts across the state that are dealing with the Marcellus industry extensively. Other districts don't experience that, so the ones that do communicate often. We try to be very consistent with issues, and a good communication network is set up between the districts. Our folks in the central office oversee the program. There is a central division that helps coordinate that. It's as good as it possibly can be based on our staffing levels and what we experience. (Pennsylvania)

It is very important [to have centralized policies] because we have a lot of engineering districts in the state. The same companies deal with multiple districts. If we are not all doing things the same way, it is not good business practice, it's just hard to implement. So I think we are all managing and following the same guidelines.... I don't want to be in a situation where a gas company comes in to me and says 'District so-and-so lets us do this, why can't you?' And it may have not been a good decision so it provides us better protection as a whole, and you're not continuously defending your decisions. (Pennsylvania)

PennDOT officials reported some initial learning curve for energy development understanding of bonding and maintenance agreement requirements, and other challenges with adoption and compliance. Officials described the formality of the process and its standard utilization as beneficial to PennDOT's efforts to resolve the situations:

It's good setting an expectation because the first year it exploded, we weren't well prepared, and it came to the point we were actually revoking permits because they weren't doing their due diligence. And you have to lay some ground rules for letting them know what the expectation is, and what isn't going to be acceptable because our roads

need to be safe and open to traffic... We had multiple meetings starting as early as 2009 or early 2010 with them, explaining that it could be more economical for them to upgrade bases than to be out there continuously repairing roads. (Pennsylvania)

We would send out this five-day notice, and then all of a sudden we would meet with a singular company that was saying, "We have the majority of wells on this site, but why do we have to pay for all of this?" And we would basically say, "We are not going to referee this for you. You guys figure it out, and if you don't, we'll revoke your permit." So that helped. It was a good faith effort that was put in place, and it's standard operating procedure now. So it's been working. (Pennsylvania)

PennDOT officials also described actions that industry had taken in advance of using roadways they had bonded to upgrade and strengthen the roads:

They have actually upgraded a number of roads because they realize they are going to be using them long term, and they don't want to continuously repair them. When we post a road, one of the conditions of the agreement they need to follow is maintaining it to the condition... which is very difficult to do on some of our rural roads. So they have actually gone in and done a lot of things like base reclamation and upgrading. (Pennsylvania)

[Now] oil companies are upgrading the roads to make them better able to handle the truck traffic. When this all first started back in 2008-2010, we had many miles of roads that were heavily damaged. Of course, nobody was prepared for how much damage actually occurred, so we had to put in some policies to protect them. (Pennsylvania)

PennDOT officials described partnering with industry on timing, resources, and staffing to accomplish projects:

We had a project planned. We would tell them [industry] what we were planning. If we were planning a resurfacing project, they might go in and do a base reclamation to get a better base, maybe put a binder, and then we will go in and do a resurfacing, kind of as a cooperative effort. (Pennsylvania)

We have some separate cooperative agreements, and there are contribution agreements. There are cases where they would provide funding to PennDOT to do the work, or it all depends what we have planned. The key is that we have something planned there, and that is where those cooperative agreements make sense... If we don't have anything planned on our roads, we...have not necessarily been changing our program, because we can't afford to do that either, just because they want to upgrade a road. We'll look at if it is somewhere on our five-year resurfacing plan. Then we may try to move it up as far as possible. (Pennsylvania)

PennDOT officials described staffing for managing the posted and bonded roadways program:

Initially we hired consultants, as an extension of our permitting staff, to go out and do the inspections on our Marcellus roads, the ones that industry is using. But then we established a position in each of our counties... Who better than our counties know the character and nature of their roadway? Because, who knows, we might hire a consultant for a couple years and then have to hire a new consultant... I feel like we should own that and it makes sense to have a person in each of our counties hired exclusively to be the

inspector on these Marcellus industries, and then they can work directly not only with our district office but also with our county staffs and our county managers. We established that within the last year, and that has worked out very well. (Pennsylvania)

We actually have folks trained so it's the same set of eyes looking at these roads. We actually just converted to an electronic process of getting the photos and sections on an iPad. In the winter, it's our construction inspectors that we bring in to do it, and in the summer months we may pick up a couple temporaries. We actually have two permanent folks in our district office also. So depending on the level of activity, we estimate whether there are temporaries we'll need to bring in. (Pennsylvania)

Other states report generally not using bonding programs or maintenance agreements on state roads for oil and gas energy development companies, although use of these types of arrangements was noted for county (non-state) roads in many of the states TTI talked with. A DOT official commented:

The state does not do [roadway bonding or maintenance agreements]. Our roads are all considered public, and therefore if you are legally loaded, you can drive on them, and whatever happens, happens. The local entities, the counties, they do that if they know there is a county or a township road because our oil wells are spaced out so far; they are in a straight line. You know what road [energy industry trucks] are going to be on, or should be on, and so the counties will make agreements like that with the oil company... The locals will have those type of agreements with companies, but the DOT, we don't on our roads. They are public roads, and if you are running legally, you can drive on it. (North Dakota)

Industry Engagement

Of the eight state DOTs researchers spoke with, only Pennsylvania has a formal, high-level effort for engaging with oil and gas well developers, called the Governor's Marcellus Shale Advisory Commission. PennDOT officials discussed the role of executive leadership in forming and participating in the Governor's Commission (although the name of that group was often confused with the Marcellus Shale Coalition) and the outcomes of corresponding meetings.

Pennsylvania also has an industry trade group, called the Marcellus Shale Coalition. Either concurrently with, or perhaps as an outcome of, the Governor's Commission meetings, PennDOT officials have also met with the Marcellus Shale Coalition at both state and district levels. PennDOT officials consider their meetings with the coalition very important to their ability to learn about industry and share activities, plans, and concerns. DOT officials commented:

The governor appointed a 13-person council that had the lieutenant governor on it, and they looked at what they can do to meet the needs of the commonwealth while working with the Marcellus industry. And they fleshed a lot of things out. From that executive leadership level, there's the Marcellus Coalition that manifested itself. And then PennDOT worked with them one on one. That just became a pretty good platform to vent what they had, and we could vent back. And we actually started to make a lot of progress. (Pennsylvania).

There was this Marcellus Shale Coalition formed...between a lot of the gas industry and the department higher-ups, to go through issues as they developed. As a result of that, one of the good things to develop was an agreement that we would develop excess maintenance agreements... Because in our area, and in a lot of other areas across the state, a lot of these gas industries, the wells, where they are located, there might be five to seven [road] users because of the lay of the ground and how many wells they are drilling in various areas. They are all using the same road to get to and from [the wells]...so we had to put provisions in place to have them cooperate, and we just did the gate keeping. And that is what we do now, from a permitting standpoint. So it has evolved. And the coalition was put in place to help talk about issues, whether they are production issues or permitting issues or even safety issues. It created a framework that would have an open and honest dialogue with the industry, and do things that we needed to do to protect our interests, which is the integrity of our road system, all the while appreciating the fact that they are a business that needs to operate. So we worked hand in hand with that. That ended up promulgating statewide, and so it's actually governed out of our central office. But it's all good, as good as it can get. (Pennsylvania)

The constant framework and the communication with the Marcellus Coalition have worked out very well. Our deputy secretary for highway administration oversees that, and that has been a big help. A lot of folks listen in on that, and sometimes people bring stuff to the coalition that is happening in every area...that they have questions on... But that whole communication has been a really good asset. (Pennsylvania)

We have a bimonthly meeting with the Marcellus Shale Coalition. We have, I think, nine different companies that are represented. They are the bigger players. We meet with them...every 2 months, and they give us feedback. They give us suggestions so we can try to work within their operations as well. There are some things that we just can't do for them, and we will let them know. But, for the most part, we ask for that feedback. I think when we started to do that, about three years ago, that started to tear down some of these walls down of "us and them." It basically opened up communication to where we understood their operational needs, and they started to understand what types of infrastructure we had, and then we started working together on it. And then their coalition started to reach out to their other folks out there who are doing the same thing, and they started to make our job a lot easier. (Pennsylvania)

We're always evolving. We have to move with our customers' needs. We have to keep an open mind, but we still have to work within the law and regulation. Once we accomplish that, then we'll have a pretty good program. So far one of the biggest things that we've done to date is to open dialogue with our Marcellus industry. We also looked at our timber/hardwood councils and the coal industry. And those folks, once they are educated, they understand our needs, and our policy is being accepted better. (Pennsylvania)

North Dakota also engages with industry, although to a lesser and more informal degree than Pennsylvania's activities. DOT officials commented:

The oil industry, they have their own group of folks here that they interact more with on the meeting side. But we sit down with them quite often to talk about load limits, their axle configurations, that sort of thing, so they can move stuff around on our roads. The DOT central office works closely with those folks and with the State Highway Patrol because they are the ones that actually issue permits to move stuff. We are a pretty small

state here. Everybody knows everybody, pretty much, so you just call them up and talk to them. It's not a real formal process here. And we set meetings periodically, where we go ahead and hold meetings and discussions on how we can do things better... [Meetings are] on a quarterly or an as-needed basis. We visit and try to work together to help each other out here. (North Dakota)

They have the oil association here with an executive director, and we work through them. And it is the major companies, the [major energy service companies] and all those folks that you have [in Texas]. In fact that is where most of them come from. We sit down and talk with the bigger companies that do the trucking and the drilling and all that. We express our concerns, and they express their concerns, and we try to reach something where basically they can move their stuff and their product without damaging our roads [more than] they have to, and also the local roads. (North Dakota)

We try to share as much information as we can [with industry]. We have worked with the North Dakota Petroleum Council and worked through them, and we try to share things about load restrictions that are coming on and when they are going off, so they understand they are coming. I think they are learning how North Dakota [DOT] runs things. We are a few years into this oil and gas development, so they know the load restrictions are there. At this time, I would say they pretty much know when [load restrictions] are coming and when they are going off. I think the thing that catches them by surprise is when [load restrictions] are going up early or off late, and that all depends on weather. (North Dakota)

Other state DOTs' representatives TTI talked to had a lower degree of interaction with oil and gas development companies. They tended to learn about industry activities and plans indirectly via other state agencies that regulate energy resources, or they learned about them over time by observing where the industry was working. A DOT official commented:

The petroleum guys, for most of our interaction with them, we've got pipeline crossings, and then we've been allowing irrigation pipe on the rights of way so they can get water to their well sites from [landowner properties]. So that's pretty much the [extent] of our communication with them. It's probably smaller contractors or companies that are doing the work that we deal with more often than not. We haven't had any interaction with a larger company saying, "Hey, we're getting ready to develop this area, and here's what's going to happen." I don't think we have. At least at our level, we don't have any of that. (Oklahoma)

[Now] we are not treating energy impacted roads differently than other roads, only because the industry impacts are becoming predictable. But in the beginning we didn't know which roads were going to be impacted, and we were more in a reactive mode. (Wyoming)

Some state DOTs identified interactions and discussions with oil- and gas-affiliated industries (e.g., midstream companies) regarding their plans and activities. This was generally in the context of permitting requirements (e.g., for driveways and road crossings). A DOT official commented:

And [the pipeline] industry actually reached out to us... I remember sitting through multiple meetings with different entities, and they would come in early and say, “Hey, we’re going to put in this gas line from here to there, and going to be crossing under these roads. What do we need to do? What do we need to understand about the permitting regulations or whether we are allowed to bore or open cut?” Things of that nature, so that was something that we just had to deal with. But the magnitude of that was a little overwhelming to us at the time. (Pennsylvania)

Roadway Funding

Two states, Pennsylvania and North Dakota, have major transportation funding initiatives that represent significant increases to state DOTs over previous funding levels (see discussion in Section 2 of this report). Other state DOTs reported little to no substantive changes to their budgets in recent years.

In Pennsylvania, passage of Act 89 resulted in increased transportation funding for PennDOT. While not specifically intended to address energy development impacts, some of the funding will be used to address roadways impacted by industry traffic, including energy development. In North Dakota, the state legislature has substantially increased DOT funding to enhance energy-impacted roadways and improve transportation infrastructure statewide. A DOT official commented:

We have a biennium budget. Every two years our legislative body meets, and this last legislative session they gave some dollars to the counties. They gave some dollars to townships. They gave some dollars to the state to deal with roadway needs, infrastructure needs, in what they call their 17 oil-producing counties. They gave money to those entities to make improvements or repairs to roadways. Historically, we haven’t seen a big influx of dollars to the DOT for roadway improvement projects. This last biennium, just for the state level, we got about \$1.6 billion. The biennium before that we got about \$238 million. We had a big influx this last legislative session. I think in total it was about \$2.3 billion for the counties, the cities, and the state [combined], as far as money to spend on infrastructure. There is always more need than there are dollars, but we’re making a lot of improvements with this money. The money we’re spending this biennium is really building a lot of bypasses around communities. Because out there, the state highway runs right through the middle of a town, and that’s where all the trucks and traffic are going. So, we’re building a lot of bypasses and stuff to get the trucks out of the community. (North Dakota)

Section 5: State DOT Practices in Addressing Energy Development Impacts

This section considers practices that state DOTs use for addressing the impacts of energy development on roadways. As opposed to formal policies and programs, researchers use the term *practices* to describe efforts that are primarily operational (as opposed to strategic), are more informal, and may be used by only some parts of a DOT. It should be noted that a number of the practices identified by DOT officials researchers talked with can be considered standard DOT operating practices. However, DOT officials that researchers spoke with referred to practices identified below as specifically being used to address impacts of energy development. The following is a summary of the four broad categories of the practices described by DOT officials:

- Infrastructure management:
 - Infrastructure management refers to practices that affect attributes of roadway and bridge preservation processes, including design, construction, reconstruction, rehabilitation, and maintenance. While these are not generally elements of state transportation management that represent policy opportunities, they may represent types of practices that may be useful for DOT applications across states.
 - North Dakota has had a substantial influx of funding to the DOT for roadway construction and reconstruction, especially in energy-impacted areas. Because of increased activity, the DOT has taken steps to enhance roadway construction, reconstruction, and rehabilitation effectiveness, including closer timing of environmental permitting and design processes, and use of different types of materials in roadway construction.
 - Most of the states have not previously had a substantial influx of funding for roadway construction and reconstruction. DOTs maintain roadways to the best degree possible given available, often limited, transportation funding.
- Short-term planning:
 - Short-term infrastructure planning, generally on a two- to four-year cycle, primarily covers identifying immediate needs for roadway maintenance or improvement activities. The different state DOTs that were interviewed handle this process fairly consistently:
 1. A centralized pavement management system collects and evaluates traffic and road condition data.
 2. A central office makes roadway improvement recommendations based on the pavement management system, and provides these recommendations to DOT

districts. Roadways with higher traffic and/or poorer condition are typically more likely to get attention first.

3. District staff review, comment on, and possibly reprioritize recommendations.
 4. The district or central office assigns projects and allocates funds.
 5. On a year-to-year basis, the DOT may change roadway maintenance or improvement priorities based on roadway conditions and traffic levels.
- Information about average daily traffic and truck traffic levels is important for both short-term and long-term roadway management planning. For the most part, DOTs use standard vehicle classifications by configuration and number of axles for their traffic counts.
 - Truck classification counts are typically coordinated by DOT central offices, who pass information on to districts. District DOT personnel who work in intensive energy development areas discussed that this information can be out of date.
- Long-term planning:
 - Two state DOTs, North Dakota and Pennsylvania, specifically discussed that they evaluate transportation infrastructure needs based on corridor analyses.
 - PennDOT officials also proactively learned about potential energy development impacts when they began to see growth in gas developments.
 - The North Dakota DOT described the need for local planning and zoning, including transportation, to maintain quality of life for communities.
 - The Colorado DOT described efforts by counties to develop transportation corridors and the state DOT's efforts to assist with that development.
 - Interagency collaborations:
 - DOT officials described the importance of permitting and enforcement of oversize and overweight vehicles. To do this, they work closely with commercial vehicle regulators, such as the state police/highway patrol.
 - DOT officials in some states, but not all, described relying on state energy regulatory agencies for key information about energy development traffic.
 - Some state DOTs discussed sponsoring or working with a Local Technical Assistance Program to advise local jurisdictions on transportation issues, including dealing with the impacts of energy development.
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- DOT officials in many states discussed providing technical assistance to local agencies about roadway design, construction, or maintenance, or dealing with the energy industries. The North Dakota DOT indicated the importance of communicating state plans with local officials.
- Some state DOTs also described coordinating with county transportation departments to deal with energy development truck traffic.

Infrastructure Management

The North Dakota DOT discussed closer timing of environmental permitting and design processes to speed up project initiation:

We're trying to run [environmental permitting and design] closer in parallel to each other. We start the environmental work, and while we are doing that environmental work, once we get down the road, we start the design right away so that once we get environmental clearance, we are close to ready and have a set of plans. Before you ran them in a linear [process] where you do all the environmental with very little design, and then do all the design. And we're pushing up the design so that we can kind of run them in parallel so that we're ready to put projects on the road quicker... We've done it on as simple a job as an overlay project, all the way to new construction... I would say it takes months off [the timeline], for sure. In some cases, if it's a larger project, where there is quite a bit involved in the design work and a lot more detailed, it would take more time off... But there are some risks with that because you might find out through the environmental stuff that you can't quite do what you want, what you already were moving on with the design. (North Dakota)

The North Dakota DOT also discussed using different types of materials in roadway construction:

We've gone to some cement-stabilized base products and cement-stabilized subgrade products to try to take a different approach to get the structural values that we need to carry the loads. (North Dakota)

You're seeing us bid alternatives where we have an asphalt alternative and a concrete alternative because of all the work we have. We're trying to let the industry decide, which is, in some cases, [the alternative that] we can get a better price on. (North Dakota)

We're trying some different asphalt types. [For example] instead of a PG-64-24, we might be going to a 78-32 or something on some of our top lifts, to see if that helps us with some of the rutting issues that we have. It's more of a materials-type change maybe than policies and stuff like that. (North Dakota)

The North Dakota DOT highlighted the importance of close coordination with its contractors:

We work closely with our consulting engineers because obviously with all this new work out here, the DOT does not staff up to do that type of work, so we have consultants doing a lot of our design. We used to consult out about 30 percent of our design and construction work, and now we are doing close to 80 percent... What our folks do is they

monitor the consultants and work with them to make sure it's designed correctly, and then also built correctly. We have six field engineers out here, monitoring, working with the consultants, to answer any questions they have... That was a big change for the DOT. It's more fun to actually be out there doing it than monitoring somebody, but we're making that switch. We do joint training. We try to get contractors in on training for our methods, erosion control issues... We try to include everybody so that everybody has the same story. We work hard to make sure everybody has no excuse for not knowing. (North Dakota)

Other states have not previously had a substantial influx of funding for roadway construction and reconstruction, although this may change in the future with additional funding in some states (described in Section 2). A DOT official commented:

Right now we are holding up OK. We've got a few places where we have some deterioration. But when the oil field kicked up, about five years ago, we had to play catch-up in [one of the district's counties] in particular. We had to move a lot of our assets over there. A lot of our money we had to move over there and change our priorities because the roads were not holding up... In a case like this, we were being more reactive than proactive, and we just went out and did whatever we could do with the money we had. We did some additional lifts of asphalt. And that's without basing it on any good information because we don't know what the actual percentage of trucks is right now. We just know that the road is not going to survive through the winter, so we have to go do something with it... We wind up in that case, where we might have been going to do some projects in other parts of the division, the ones that were in better condition, we would just delay those and move that money to [the impacted county] and use it there. We also gave the local maintenance yard an additional quantity of asphalt, so they were doing more asphalt patching themselves. So we did more by contract and more with our own forces to just react to the situation. (Oklahoma)

Roads that are impacted by energy development are often impacted so quickly that techniques used for maintenance become ineffective from a long-term pavement preservation perspective. More extensive (and costly) rehabilitation and reconstruction are then required to bring roads back to acceptable performance levels. State DOTs can use a variety of techniques and timeline acceleration mechanisms for road rehabilitation and reconstruction. Techniques can vary in terms of cost and enhancement to roadway structures. This review identified that use of these practices and incentives can vary widely, even from district to district within the same state.

Short-Term Planning

Short-term infrastructure planning, generally on a two- to four-year cycle, primarily covers identifying immediate needs for roadway maintenance or improvement activities. Different state DOTs that researchers spoke with handle this process fairly consistently.

A DOT official described the need to be flexible in addressing roadway improvements:

[The DOT's roadway improvement plan] is a living document, so to speak. If everything is changed...and all of a sudden a road that we thought was good for another two to three years falls apart because the oil industry switched their concentration, then we have a real

flexible way that we try to get those [improvements] going... There is no form that we plug stuff into and it spits out something like that. What we do is look at our road system—we try to get a corridor finished, so we look at what is out there and what the traffic projections are. We've been getting a lot better on our traffic projections. They were increasing much more rapidly than we had initially thought... We have our district engineers involved in this. We have data on our road system, what the traffic count is, what the life expectancy is, what it is going to take to bring it up to speed, at least on future traffic projections. We go through that, and we look at the roads, and we think, "OK, here's what it is going to cost to do this." And then we go until we think we have a decent amount of...how much work can be handled, and without shutting down every road in the state while we build it. (North Dakota)

Information about average daily traffic (ADT) and truck traffic levels is important for both short-term and long-term roadway management planning. For the most part, DOTs use standard vehicle classifications by configuration and number of axles for their traffic counts. These data are used as a general planning guide and to generate the number of equivalent single axle loads (ESALs), a process that is generally formulaic. Based on its structure and condition, a given roadway has an expected number of ESALs it can withstand in its lifetime. A DOT official commented:

We design based on ESALs, which is [based on] your trucks, so that factors into pavement life, remaining life, and what type of improvement we should be doing. We use that ADT also to figure out what standard we want to build the roadway to, whether it is a 24-foot top or a 40-foot top or whatever. So we do take all those traffic counts in place. We also use it for turn lanes and other safety features that may be needed... Traffic plays a part in all of the geometric pieces that we work on. (North Dakota)

DOT central offices typically coordinate truck classification counts and then pass the information on to districts. District DOT personnel who work in intensive energy development areas discussed that this information can be out of date. They identified situations where they conducted their own traffic data collection to provide more recent and relevant information. A DOT official commented:

There was one particular location where I put some traffic counters out there to see how much of an increase there was on one particular route, but we've not done that with any other routes or anything like that in our district... It was a response to a complaint. They just wanted to see what the increases were. And so, on that particular occasion, there was also a compressor station being built, so there were a lot of personal private cars being driven back and forth on this road, in addition to the heavy trucks. (West Virginia)

Long-Term Planning

Some of the states discussed that they evaluate transportation infrastructure needs based on corridor analyses:

When we started to get [increases in oilfield activity], we did some planning and did an overview of what we were going to need there. And we fine-tune that as we go along because our oil industry may take off in a different direction or area. After about five

years now, they pretty well know the limits, and they know where they are going to be drilling. Basically, they are starting to infill the wells... So we kind of know where they are going to be for a while here. Those are roads, obviously, that we concentrate on, to get beefed up, to handle the loads... So what we do is try to stage our projects. We try and complete routes. (North Dakota)

Basically, we are going through our entire roadway system out here and beefing it up, widening it out, putting some four lane [roads] in where we had two lanes before, things like that... Like right now, we are working on Highway U.S. 85. We started at one city, and we are doing four different projects to get to the next city, and we are making that a four-lane project between two of our cities because that is where a lot of the impact is. And then what we also have is the Missouri River, which goes through with a big dam, and there are only so many crossings across that reservoir. There is a loop that goes around [the reservoir] where the oil industry comes out and services the wells... Then we try to build up our highways that intersect those [loop highways] and bring those up to speed. (North Dakota)

We look at corridor effect. Is that the only corridor in that area? ... Are there alternative routes? Is there a bridge on that road? These are things we have to think about, not only the road, but we have to stretch our scope farther...to incorporate bridges, and what I call a lot of finger-type roads that basically feed into it. We also look at the corridor as a whole to make sure we are doing the right thing. (Pennsylvania)

PennDOT officials discussed what they did to learn about potential energy development impacts when they began to see growth in gas developments:

Prior to the Marcellus industry coming in, we had been listening and learning from other states across the nation, how this whole operation would work. And at the time, Pennsylvania as a whole didn't have much in place, either the whole state government or down to municipality level... We didn't go out with the idea of posting a lot of the bridges and roads, but we did [end up doing that] because we just knew from the heavy traffic that was going to happen that we wanted to create an environment where we could work hand in hand with the industry to protect our roads. And I'm glad we did because in some areas we've seeing traffic increase 30 percent overnight, truck traffic, where it never existed before...or actually everywhere. (Pennsylvania)

In advance of the major wave of Marcellus coming, we went out and basically studied our roadway network and said, "OK, which ones do we think can withstand the amount of traffic?" And when I say learning, we had to learn what goes on when a well is fracked, to what extent, how many water trucks they use, what kind of equipment they haul in and out... It was just a matter of us learning what is going to go on with these well pads—how much acreage do they take up, how is it going to work? It wasn't as if we were worried about the goings-on beneath the surface of the ground. We were just worrying about the dynamics of it taking place with getting a well site established, the traffic, the type of equipment that was needed, the permitting, whether or not we had posted bridges. (Pennsylvania)

A North Dakota DOT official also described the need for local planning and zoning, including transportation, to maintain quality of life for communities:

At a local level, city/county level, they've got to get a comprehensive land use plan in place as quickly as possible and be tough on the zoning. Otherwise, you have [stuff] all over the place—an industrial site here next to a housing development next to a man camp next to a trailer park. So in order to keep the quality of life, you've got to get a comprehensive land plan done and enforce zoning heavy duty. And that didn't go over real big in Western North Dakota... But if you don't do that, and you don't do that right away and make sure they go on certain roads...they won't like what they see when it's turned out. (North Dakota)

A Colorado DOT official described efforts by some counties to develop transportation corridors and the state DOT's efforts to assist with that development:

The counties are trying to put some alternate routes in. They're spending \$135 million to build a concrete route parallel to one of our major U.S. highways, and it will probably take a lot of pressure off our roads. So we are working with our counties in locations where we can to strategize routes so that [the trucks] are contained and on the right roads. (Colorado)

Interagency Collaborations

DOT officials described the importance of permitting and enforcement of oversize/overweight vehicles and how the DOT worked with commercial vehicle regulators, such as state police/highway patrol:

We will do things for [the highway patrol] as far as building inspection sites for them along certain roads so they can inspect [the trucks]. We will assist them in buying some scales once in a while through any funds we can use so they have portable scales, stuff like that. We have one project where we are actually relocating a scale house for them and basically building them an inspection barn. (North Dakota)

The key to the whole [pavement management] process is that we get some enforcement of overweight loads. Overweight loads are a major contributor to the stress that the pavement has to survive. (Oklahoma)

We built some pullover areas so the Department of Public Safety has a place to pull trucks over. That's another problem. If you have a narrow two-lane highway with no shoulders, even if there is a highway patrolman there, if he's got an 80-foot-long truck he's going to try to pull over somewhere, that's not necessarily easy. So we made some areas they could pull them over and weigh them. (Oklahoma)

We work closely with our state police... So for instance, if we get a call from a county that they are noticing a lot of hauling on their roads, we would work with our weight enforcement team through the state police to go out and do a check. The state police look and see if they've got permits, just to see and understand what's going on. (Pennsylvania)

DOT officials in some states, but not all, described relying on state energy regulatory agencies for key information about energy development traffic:

In the early days of when the industry started coming in and putting these wells in, we said, "Who could be best [to work with]? What is the permitting process that they go

through?” And we knew they would have to go through the [Department of Environmental Protection] to get a permit for the site in the first place. So we worked with [DEP] from a communications standpoint to let us know if they knew of where these wells were going to be permitted or an application had been made. This gives us that information on a map so we can...see what roads they are most likely to take and make sure that we have mechanisms in place to go to the industry or gas well driller and work hand in hand with them before they even get their permit to make sure they know what our interests are—protecting the integrity of the roadway. (Pennsylvania)

Our Oil and Gas Division [part of another state agency] tracks the different processes that drilling companies use. [The drilling companies] are getting a lot more efficient... They can drill a well...every 30 days, and they are getting a lot more efficient than they used to be. They monitor that constantly, what is being used there. They know how many water tanks it takes, how many pipe trucks, etc.... [The Oil and Gas Division talks] to the oil folks, and they give [the Oil and Gas Division] that number, and they are also the ones that issue the permits for the wells. So, as part of that, [the Oil and Gas Division has information on] how many trips they are making and that kind of stuff, and how they are going to get the oil out, that sort of thing. (North Dakota)

We get ahold of [the Oklahoma Corporation Commission] occasionally. We had a trucker—I don’t know what happened—he must have broken something on the truck, but he spilled oil all the way down the highway and then off onto a county road. So if we get some situations like that, [the Oklahoma Corporation Commission] will help us get some insurance information, that type of thing. We get them involved if we have an oil spill or any kind of issue like that. They will get involved. But as far as working with [our specific DOT division] no, they are just dealing with us on specific issues. (Oklahoma)

Some state DOTs discussed sponsoring or working with a Local Technical Assistance Program to advise local jurisdictions on transportation issues, including dealing with the impacts of energy development:

We have really been trying to work with our LTAP center because that should be their job—working with the local communities, local counties, and so forth. We’ve had a study with them—what is Wyoming going to be expecting compared to North Dakota, and all those things. A lot of times we lean back toward the University of Wyoming and the LTAP center there because they have really good relationships with the counties, and we just try to foster that. (Wyoming)

DOT officials in many states discussed providing technical assistance to local agencies about roadway design, construction, or maintenance, or dealing with the energy industries. A North Dakota DOT official also commented about the importance of communicating state plans with local officials:

I think the biggest [promising practice] is just to talk to each other... So we talk a lot...visit with the locals, go to county meetings and stuff, just let them know what we are doing at the DOT. As you can imagine, there is a lot of misinformation about what we’re doing or going to do or have done. This way I can visit with them, and they can let me in on what they are planning. You hear about new developments or something else going on, oil related or whatever. We can talk about that and share information. (North Dakota)

Some state DOTs also described coordinating with county transportation departments to deal with energy development truck traffic:

One of the things we started doing with the county committee occurs when we start permitting access. We've had to really work with them on our traffic control and some of the things on our roadway systems. You'll have an intersection that doesn't have a lot of stopping and shoving [of the pavement], and then all of a sudden, you turn around and you've got a thousand trucks a day stopping and shoving. So what we're trying to do is stage these so they go off to the sides of the road, and then we do a single closure and let them all in, and we open the road so we don't impact our traveling public. So we've worked really closely with them. (Colorado)

Section 6: State DOT Constraints

Previous sections examined the impacts of energy development on state roadways, as well as policies, programs, and practices used by state DOTs for addressing these impacts. This section looks at the constraints that affect or limit DOTs' ability to act on or react to the roadway impacts of intensive energy developments. Constraints are external factors that are either independent of energy developments or the indirect results of energy developments. The constraints primarily relate to the effects of:

- Traffic.
- Infrastructure.
- Finance.
- Planning/information.

Traffic

The North Dakota DOT discussed the constraints that traffic places on roadway construction, particularly that traffic needs to keep moving even when construction is occurring:

There is a limit to how much you can actually do here simply because you still have to move traffic. Right now we have part of our roads down to 25 [mph], 45 here and there, with restrictions, and that affects traffic. And while they are happy when we are done, while we are doing it, they're not too happy. It slows everything down. (North Dakota)

Heavy traffic also impedes the ability of law enforcement officials to conduct commercial vehicle enforcement activities (license and weight, and inspections) because there is limited space for safe operations, and limited personnel available for conducting enforcement activities relative to demand. The North Dakota DOT (and other state DOTs) have constructed pull-out sections next to some roadways where law enforcement can safely pull trucks over. A DOT official commented:

When you have bumper-to-bumper trucks going down the road, it gets a little tough to pull a lot of them over. Where are you going to do it? So we actually build some pull-outs so [enforcement personnel] can pull the trucks over and weigh them. And again, with the sheer number [of trucks], you can only get a very, very small percentage of them. So it is hard to get a handle on...where you put all the trucks to weigh them, how many [enforcement personnel] you put out here. You can only have so much space to actually do the enforcement part. (North Dakota)

Infrastructure

Section 3 of this report noted the extremely rapid impacts of energy development on historically low-volume rural roads. Many rural roads were not properly designed and engineered for heavy traffic, but instead they were built and maintained over decades when traffic levels were low. These roads often lack sufficient base and pavement structures to withstand the heavy and

repeated loadings of large trucks. This can constrain the DOT's ability to preserve them through lower-cost maintenance efforts versus the higher-cost rehabilitation and reconstruction required to provide structural capacity to withstand heavy-truck traffic. DOT officials commented:

A lot of [historically low-volume roads] were given to us by the counties back in the 1920s. The majority of them have a base underneath them with very little pavement structure... Some are just built on whatever is there. (Colorado)

Obviously in western North Dakota, before the oil hit as hard as it has now, basically it was a farming/ranching economy. And so, the roads we built were not really heavy duty as we didn't see a lot of heavy-truck traffic on them. (North Dakota)

[Historically,] there were lots of counties that built gravel roads, and then when the highway department was formed and as that system was developed, in the rural traffic areas we took on a lot of roads that were [only] chipped over time and have asphalt overlays. So, there is no engineered structure or base underneath them, just a kind of seat-of-the-pants, put-some-surface-on-it road that we are maintaining. (Oklahoma)

You have to understand when these roads were built, years and years ago, a lot of these roads were just paved-over wagon trails. They didn't have a base; they weren't engineered to have anything. Most of these roads are lucky to have 6 inches of natural stone under them. So what we're going to have to do is build a base and reconstruct the road to support that kind of hauling activity. (Pennsylvania)

Say you have a two-lane rural highway, and you need to come in, and you realize these roads are going to be receiving a lot of different heavy loads from these trucks that you know they aren't designed for. So [with less heavy traffic] you could come in with a 2- to 4-inch overlay of structural asphalt on that road, compared to coming in and removing some asphalt and putting maybe 6 inches or more [with more heavy traffic]. Of course costs are going to go up significantly—not just from the removal of the old material aspect, but also the new additional hot-mix asphalt you would have to place. So your costs are probably anywhere in the neighborhood of 50 to 100 percent more, I would assume, maybe even higher. (Utah)

Finance

Section 4 discussed financial policies and programs for addressing the impacts of energy development. Financial constraints limit the actions that DOTs can take to address the impacts of energy development on roads and bridges. In particular, limitations to funding for roadway maintenance were mentioned by DOT officials in multiple states (including Pennsylvania, which has had increases to its capital improvement funding through Act 89). DOT officials commented:

The way our maintenance projects are allocated and the money that our counties get for maintenance on the roads in their areas, it's all done by a formula that was put in place years ago... We had gone through many years of budget flatlining and no money, and just this past year we passed Act 89 in Pennsylvania that puts in place a framework to get more state revenue for the bigger capital improvement projects. But all the while that really hasn't impacted our maintenance budgets that much. In fact, theoretically back in the '90s when the last gas tax increase was put in place, some of that money went into our maintenance allocations. But it really has not increased proportionally with inflation

over the last 20 years. So when the industry comes in, and they start damaging a lot of our roads—not just the smaller ones adjacent to their site...in an instant you have to change your maintenance plans to fix those areas. So it's been a real challenge to keep on top of that, for maintenance and just keeping the roads in a good condition. (Pennsylvania)

Our funding comes from vehicle gas money and diesel, vehicle registrations, and the luxury tax... And that's really our only funding mechanism. So, as people get more fuel-efficient vehicles, they are actually buying less gas, or if the price of gas continues to increase, people are opting not to drive as much... [Our funding] doesn't actually change... [The energy industries] utilize a lot of the West Virginia routes and the U.S. routes that they don't actually have to bond. And those roads should be strong enough to withstand the amount of traffic, but with the reduced funding, the freeze-thaw cycle, and just the normal wear and tear on the pavement through just being out in the weather, it's hard to get those fixed with the reduced funding. (West Virginia)

Several DOTs described the demands that intensive energy development has created for materials and personnel. These demands have limited the availability of these resources and resulted in cost inflation. DOT officials commented:

What has happened to us in western North Dakota here, it is an area of the state that is short on aggregate, it is short on manpower, and it is short on housing... Housing is really short out here. And so the cost of doing business out here for the contractors—with lack of housing, lack of local manpower, and the high cost of materials—has driven their price up considerably. It is much more expensive for us to work in this part of the state than in the rest of the state. Those costs have gone up over the last few years quicker than we had anticipated, so we weren't able to get our full programs done because we were out of money. We've been increasing our estimates, so we get a little more accurate on that. [The legislature has] been funding us at the level that we think we can get it done. And with the increased cost of doing everything out here, sometimes we don't get all our projects done that we had anticipated. (North Dakota)

One side impact we're seeing is that we're losing a lot of our people to the industry. They come to this area, they pay pretty well, and we're losing a lot of our equipment operators, which is very difficult for us. And it's very difficult for the DOT to replace them. We have only so much we can pay, and the industry can pay so much more than that. The population densities are very low, so it's just a problem. (North Dakota)

The market fluctuates so significantly now with the cost of crude, and also actually a lot of the oil refineries have gotten out of the asphalt market because it's just not as profitable for them as it is to make fuel. So that has also put a strain on the market. The costs overall, though, in the last few years have leveled off. They're not spiking as high as they used to be. Hot-mix asphalt had risen significantly, but it has tapered off these past few years. We also have clauses in our contracts now that if there are big fluctuations in the cost of oil from when the contract is bid to when the work is actually done, either increase in cost or decrease in cost, we can by policy go in and adjust those numbers the contractor has bid to us. (Utah)

Other DOT officials mentioned external factors such as weather that used up resources they might otherwise use for addressing roadway preservation, including mitigation of energy development impacts:

Now, every year [the roads] are reevaluated. What I mean by that is depending on how much budget we have, depending on whether the road “blows up” or not, how our budgets are impacted... We had a real bad winter this year, it was a long winter, and we used an astronomical amount of roadway material, salt... and that certainly blows our poorer counties’ budgets. It just goes out the window. (Pennsylvania)

In addition, the sheer magnitude of the amount of work that needs to be done also presents a constraint of sorts on DOTs. Along with resource limitations and DOT planning practices, this highlights the importance of asset management and preservation action prioritizations. DOT officials commented:

You can only throw so much money at a problem because there are only so many contractors, so many human resources, so many engineers, to get all this done. (North Dakota)

We are so far behind that we’re not going to catch up, but we do have a Decade of Investment Plan in place, statewide, that includes every district and county. We have identified roads that need to be done and bridges that need to be replaced and when, to the best of our ability, but that assumes a certain amount of federal funding. But on the state funding standpoint, it’s not as if we got Act 89 and things have leveled off with the gas well industry, that now we can just work a summer and get caught up. It’s going to take us years to get caught up. And then on top of that, we don’t know if there might be an upswing in the energy area, so they might come in and start getting down to the Utica seam and all this other stuff. Who knows? (Pennsylvania)

Planning/Information

Sections 4 and 5 highlighted the efforts of DOTs to engage with energy industries. A primary motivator for doing so is gaining information about future energy development activities. DOT officials expressed uncertainty about upcoming energy developments. DOT officials in some states also expressed uncertainty about the effectiveness of efforts to engage with energy industries and obtain advance planning information. The planning timeframes between DOTs and the energy sector are drastically different. DOT officials commented:

We do have a planning group that works very closely with our Oil and Gas Division, which is [in] another state agency, and we will work with them because they can help us identify where leases are, where drill rigs are, when leases may be coming due, stuff like that, to try to forecast where they are going to go. But that industry is hard to tag to know where they are going to go next. And they are not that willing to share the information to say, “Well, we’re going to go drill over here in two months or three years or whatever.” You don’t get that kind of information from them. But we do our best to see what is going on, and working with our Oil and Gas Division, they’re a little bit closer [to the information] because they do the permitting and they can help us, give us some

information. We do our best to try to figure out where they are going to go. (North Dakota)

When we are putting together a set of plans for a project, we don't have up-to-date information. It could be one year or two years old...because we have data that comes from [our] pavement management [division]. They have a contactor that goes around with a specialized van. It measures rutting, cracking, faulting, all these different factors. And they put together some indices of the condition of the pavement. We use that information and the daily traffic information, the percentage trucks, and that is how we put together a set of plans. When we put together a set of plans, we normally have to have them put together and submitted to our headquarters...four or five months before they go out to letting, so it may be six or seven months later, after you've built the plans, that the project is actually getting ready to start. In that timeframe, you could have had some sort of a boom take place, and your conditions could have changed. And so, I think really, the system we have now, it would be hard to make it better. If the industry was aware of something, a buildup of activity, and they reported that [information] to somebody, that's a possibility [for improving planning], but I don't know that it's a manageable process. (Oklahoma)

Section 7: State DOT Needs and Implications for Texas

This report has covered how intensive energy development impacts roads and how state DOTs use policies, programs, and practices to deal with those impacts. DOTs also have constraints that limit their ability to do so. Researchers interviewed DOT officials from eight states: Colorado, Kansas, North Dakota, Oklahoma, Pennsylvania, Utah, West Virginia, and Wyoming. Along with Texas, these states have experienced some of the most intensive oil, gas, and wind energy development in the country relative to their state areas, populations, and roadway miles. Based on interviews with DOT officials, researchers identified the following needs for oil and gas energy developments. These needs can also apply to other energy developments such as wind farms; however, DOT officials in general expressed fewer concerns with wind developments than oil and gas.

State DOT Needs

Based on the input that the DOT officials provided, researchers identified the following primary DOT needs for addressing future energy development impacts:

- Information about current traffic and future energy developments.
- Engagement with the energy sector.
- Regulatory approaches.
- Long-term planning.
- Means to support economic activity and protect public interests.
- Funding.

Information about Current Traffic and Future Developments

State DOTs discussed two types of information needs:

- Accurate information about current levels of heavy-truck traffic on roadways.
- Information about future energy development activities.

Sometimes, there are close relationships between these two types of information.

DOTs use information about traffic for a wide range of applications: making sure operations keep traffic moving efficiently, programming pavement repairs to make sure roads are smooth and long-term costs are limited, designing additional roadway capacity to eliminate bottlenecks, and developing safety measures to reduce crashes and loss of property and life. Information about heavy-truck traffic is a key part of models and programs that DOTs use to help them do these things.

Historically, rural traffic patterns did not change drastically from year to year, except in limited cases or locations. Under normal circumstances, DOTs can collect data on an annual or biannual

basis, obtain a relatively accurate picture of incremental changes in traffic, and use this information for managing state assets.

Intensive energy development alters this pattern. Virtually overnight, heavy-truck traffic on rural roadways with previously low traffic volumes—fewer than 50 trucks per day—increases to hundreds or thousands of trucks per day. DOT officials reported that roads that had lasted for decades were destroyed and impassible in days or weeks.

State DOTs need up-to-date information about heavy-truck traffic on their roadways, because this is a key input for both short-term and long-term planning and decision-making. However, data that DOTs collect for supporting decision making for pavement maintenance, construction, or safety programs are often out of date and do not match the timeframes of energy development traffic. Officials from multiple states indicated that current traffic data collection programs are insufficient for their needs. Some district/regional officials are addressing this gap by conducting supplemental data collection or adapting dated traffic data with recent local estimates, or they are left to use out-of-date information. More frequent traffic data collection and system monitoring, including a focus on energy-impacted areas, can help DOTs address these needs.

Engagement with the Energy Sector

Another way for DOTs to obtain information about future traffic impacts is directly from the energy industry through collaborative, working relationships between the public and private sectors. Pennsylvania has a formal, high-level commission on energy development, and PennDOT also meets regularly with the state's energy-sector trade organizations. PennDOT officials talked favorably about their ability to work with the energy industry, address mutual concerns, and learn about respective operational requirements.

DOT officials need mechanisms for effectively engaging with the private sector.

Officials in some states indicated ad-hoc, informal communications with energy industries. Other state DOT officials reported little or no interaction with industry. These states tended to be much more reactive to energy development impacts. DOT officials need mechanisms for effectively engaging with the private sector, including venues and forums that facilitate open and honest communications and provide structures for mutual problem solving and learning.

Regulatory Approaches

Direct input about the energy-sector truck traffic activity can also be obtained through regulatory processes under DOT control, such as bonding requirements, road user maintenance agreements, and permits, where applicable. Pennsylvania and West Virginia require bonding and maintenance agreements by industry users of historically low-volume, load-posted roadways. Road users who fail to comply with agreement requirements can have their permits suspended. PennDOT has enhanced staff levels to be able to effectively monitor industry activities and work

quickly with industry to solve problems. In addition, DOT officials and other sources suggest that as a result, industry has covered tens to hundreds of millions of dollars in roadway maintenance and upgrades to rural roadways in these states.

Most DOTs in this study have little or no road bonding/user maintenance agreements on state roads. They typically have driveway, right-of-way, and access road permitting standards and requirements. Some DOT offices are using these mechanisms to obtain information about traffic impacts from installations of new wells or pipeline contraction. This information might include, for example, the number of trucks expected, types of trucks, and duration of activity for a given roadway or well. This helps fulfill short-term, localized information needs.

Long-Term Planning

Key long-term, regional and statewide needs of DOTs are understanding where, when, and for how long intensive energy development is going to take place. DOTs need this information to plan strategically for major investments, such as identifying which corridors need rehabilitation and/or new construction. Unless long-term development information is obtained directly from energy industries—and this seldom happens—DOT officials in some states are relying on partnerships with agencies that have direct energy-sector regulatory authority, typically housed in state agencies that oversee natural resources or environmental protection. Other DOTs are taking a wait-and-see approach to understanding where and when the energy sector will be moving next.

Key long-term, regional and statewide needs of DOTs are understanding where, when, and for how long intensive energy development is going to take place.

DOT officials also perceive that energy industries themselves may not know where they will be in the long term or how intensive their activities will be. Factors such as energy markets and commodity prices, regulatory frameworks, evolving drilling and fracking technologies, and the availability of supporting infrastructures (e.g., alternate routes, water pipelines, product pipelines, transloading terminals, and railways) were cited as some examples of factors that can affect the future intensity of energy development and associated heavy-truck traffic. Advanced, systems-based forecasting models that integrate economic, social, environmental, and legal factors are needed to develop potential energy development impact scenarios at state, regional, and national levels. While some states have begun doing so—North Dakota DOT’s partnership with the Upper Great Plains Transportation Institute is an example—this is likely beyond the purview and resources of some individual state DOTs.

Yet even if information about future energy development activities were available, some DOT officials were uncertain about their agencies’ ability to use such information. The officials questioned whether current agency planning and programming frameworks could adapt to less-conventional information inputs than they are used to dealing with, and how useful such

information would be in light of limited financial resources. Other state DOTs are leading development of new transportation planning and decision-making tools, including geographic information systems.

Means to Support Economic Activity and Protect Public Interests

DOT officials in multiple states commented about their agencies' roles in balancing protection of public infrastructure and accommodating and facilitating business development. DOT officials recognize the substantial economic benefits that energy development industries provide, but DOTs frequently lack the means to ensure that the general public and private business interests have roadway infrastructures that are adequately constructed and maintained. In addition to the resources DOTs need for enhanced data collection, engagement with industry, interaction with other agencies, and development and implementation of advanced planning tools, DOTs also need resources for protecting, preserving, and upgrading infrastructure.

Protection of public safety and existing infrastructure through traffic and commercial vehicle enforcement is one such resource. Trucks involved in natural resource industries are often oversized and/or overweight, and some of them are operating illegally. A truck that is operating over legal weight limits is especially problematic because the damage to road and bridge infrastructures increases exponentially with axle load. A substantially overweight vehicle can cause a road or bridge to fail in a single pass. In addition, increased traffic congestion can also result in unsafe driving behaviors by truck drivers and the general public. DOTs need their state and local law enforcement agencies to have sufficient personnel and facilities to adequately protect public safety and infrastructures.

Funding

Financial resources can come in a variety of formats. Obvious funding sources are direct legislative appropriations and/or industry bonding and maintenance agreements. DOTs in Pennsylvania and West Virginia have estimated that roadway bonding programs and user agreements resulted in hundreds of millions of dollars of equivalent value in rural roadway maintenance and rehabilitation by industry. This helps address some cost impacts yet also fails to cover impacts on higher-level roads such as state, U.S., and interstate highways. DOTs need resources that allow them to address impacts to rural secondary road infrastructures and higher-level roadways.

Some states have recently had major increases to transportation funding, particularly capital improvement programs. This funding can be directed to address some energy impacts for some corridors.

Some states have recently had major increases to transportation funding, particularly capital improvement programs. This funding can be directed to address some energy impacts for some corridors. However, it frequently does not cover all needs, in particular maintenance funding,

which is typically tied to registration fees and fuel taxes, and remains constant or even decreases over time. Limited or reduced short-term infrastructure preservation activity results in higher long-term costs for the eventual rehabilitation and reconstruction that will be required. DOTs need funding options that provide sufficient financial resources across short-term and long-term agency functions, not just for construction of new infrastructure.

Further complicating matters of resource allocation are cost increases to materials and personnel. DOT officials commented about high rates of inflation for asphalt and aggregates in energy-impacted areas. Also, the wage structures for public employees often fail to compete with those of energy-sector positions, limiting the pool of employees and increasing turnover. Time is another critical resource need. DOTs need to be able to catch up, either through hiring or contracting additional help; get a break in the frantic pace of energy development; or both. DOTs also recognize that immediately addressing every single need may not be the best option.

Further complicating matters of resource allocation are cost increases to materials and personnel.

Implications for Texas

This study did not evaluate the effectiveness of DOT policies, programs, and practices on their abilities to respond to energy development impacts, either through qualitative feedback from DOT officials, or through quantitative analysis of technical data for specific measures such as roadway quality or preservation. Both of these evaluations could provide valuable information about the practical merits of various DOT policies, programs, and practices, and are important next steps.

The experiences of other states cited in this report can, however, provide useful information for Texas as it considers how to address its own challenges presented by energy development activities. Policy and research questions include the following:

- Collaboration and communication:
 - How can state agencies work together to share information and plan strategically (short term and long term) to balance economic development with infrastructure, safety, and environmental impacts?
 - Should there be a formal, high-level mechanism for bringing the private and public sectors together to address Texas' energy development and transportation needs? Or can informal, ad-hoc processes between the state and energy industries function effectively to enhance problem solving and mutual recognition of respective operating concerns?

- What are the rules of engagement, expectations, and obligations for collaboration and communication? What are the consequences for failure to participate or deliver on agreements?
- Infrastructure management:
 - What are the expected outcomes of continuation of the status quo for transportation planning, funding, and infrastructure management practices?
 - If there is to be increased funding for addressing the impacts of energy development on transportation, what are the appropriate sources and levels of funding? Where is funding applied? How is funding managed?
 - What are the roles, if any, for the private sector in maintenance of impacted public infrastructure, or addressing congestion and the driver behavior issues associated with energy industry traffic?
 - What personnel, materials, and other resources are required for state agencies? Which agencies should be involved?
 - What innovative forecasting tools are available to help predict energy development activities and their associated effects? What innovative tools, methods, and practices are available to help plan for short- and long-term intensive energy development impacts on transport systems?
 - How does the state balance tradeoffs between the planning horizons of private industry and public sectors?

Local Impacts

While this report focuses primarily on state DOTs, several DOT officials TTI talked with commented that county, township, and municipal transportation infrastructures were especially hard hit, as much or more than state systems. Policy and research questions include the following:

- What are the financial, management, and environmental impacts on local transportation systems? How are they similar to or different from impacts on state systems?
- What is the role of state government in meeting local needs, whether through funding programs or local technical assistance programs?
- Are there differences between urban and rural populations concerning energy development and its impacts on the state's transportation system and overall economy? If there are differences, what are the implications for policy and utilization of state funds?

- How does overall transportation planning affect community development, growth, and sustainability? How does broader community planning, growth, and development affect ability to effectively plan for, construct, and maintain transportation infrastructure?
- What are the legal frameworks and authorities available to local jurisdictions, other promising practices, or additional needs?

Each of the states in this study has different combinations of policies, programs, and practices they use for addressing the impacts of intensive energy development on infrastructures such as public roadways. Policies that work in one state may not work in another. A systematic approach to balancing the economic, social, and environmental benefits and the costs of energy development, including impacts on transportation, requires careful consideration and evaluation.

Appendix A: Energy Development Data

TTI researchers collected state-level data about these energy development activities and the different characteristics of each state in terms of size (geographic area), population, and transportation infrastructure (roadway mileage). The researchers used the data to develop an indicator of recent energy development *intensiveness*. This indicator normalizes the raw energy development/production data by accounting for the different characteristics of each state in terms of size, population, and roadway infrastructure. The energy intensiveness indicators were then ranked for each normalizing factor and averaged.

Energy Development Data

1. Crude Oil Production

TTI researchers used EIA [crude oil production](#) data to calculate the average volumes of extracted crude oil (annual average thousand barrels per day) between 2007 and 2012 for each continental U.S. state.

2. Crude Oil Well Development

Ideally, data on the *number of producing crude oil wells* per state could be used to identify well development activity in different states; however, these data are not readily available from online sources for many states or from EIA. Growth in crude oil production was instead used as a proxy indicator for crude oil well development. This indicator assumes that increases in crude oil extraction volumes are primarily due to development of new wells, rather than increased production from existing wells. Researchers calculated year-to-year changes in the amount of crude oil produced in each state (e.g., 2007–2008 and 2008–2009) and then averaged the growth in production over the time period. This is different from simply taking the difference in production in 2007 and 2012, and dividing by five (years) because a state could have both year-to-year increases and decreases in crude oil production over the time period.

3. Natural Gas Well Development

Data on the [number of producing natural gas wells per state](#) are available from EIA. Researchers calculated year-to-year changes in the number of producing natural gas wells in each state between 2007 and 2012 (e.g., 2007–2008 and 2008–2009), and then averaged the change in the number of producing natural wells over the time period. This is different from simply taking the difference in the number of producing natural wells in 2007 and 2012, and dividing by five (years) because a state could have both year-to-year increases and decreases in the number of producing wells over the time period. The indicator assumes that positive increases in producing natural gas wells are due to installation of new wells, rather than reactivation of existing but non-active wells.

4. Wind Turbine Development

Data on the [number of utility-scale wind turbines in each state](#) are available from state factsheets compiled by the American Wind Energy Association. Because historical data are not consistently available for each state, this indicator assumes that all wind turbines were installed relatively recently.

State Characteristics

State-level factors for area, population, and roadway mileage were used to normalize the raw energy development statistics described above. Data for state [area](#) and [population](#) were obtained from the U.S. Census Bureau. [Mileage](#) data for roadways owned by state highway agencies and counties were calculated using statistics from the U.S. Department of Transportation Federal Highway Administration (Table HM-50).

Each factor accounts for different aspects of energy intensiveness:

- Area accounts for the relative density or concentration of energy development activity.
- Population accounts for impacts on residents due to energy development activity (e.g., tax-funded roadway infrastructure maintenance).
- Roadway mileage accounts for impacts on transportation infrastructure.²

For example, according to EIA, Texas produced approximately 1,313,200 BPD of crude oil between 2007 and 2012 on average, while North Dakota produced approximately 317,700 BPD of crude oil during the same time period on average, about $\frac{1}{4}$ the amount of Texas. Yet Texas also has a much larger land area, population, and number of state and county roadway miles that might be impacted. In comparing the *intensiveness* of crude oil production activity in these states, Texas produced 4.89 BPD per square mile of land area (ranked first), 0.052 BPD per person (ranked sixth), and 6.60 BPD per road mile (ranked fourth), for an average energy intensiveness rank of 3.7. North Dakota's numbers were 4.49 (ranked second), 0.472 (ranked

² In using state-level statistics, the factors assume that energy development and associated impacts are distributed equally across a given state. This is not strictly the case. For example, urban populations and roadways may be less directly impacted by energy development than those in rural settings. However, even when the location of particular energy extraction activities are confined to one area within a state, its impacts are not so confined. Materials, equipment, and supplies for both wells and wind turbines may be transported from site to site, from source locations and facilities to their destinations, and across state lines. All taxpayers may be impacted when funds for addressing roadway damage are not recovered.

In addition, different types of energy development activities are not necessarily concentrated in the same areas: one part of a state may have oil-producing shales (e.g., the Eagle Ford Shale), another part may have gas-producing shales (e.g., the Barnett Shale), and another part may be more suitable for wind energy (e.g., the Texas Panhandle). The practical implications of parsing out specific counties/regions, populations, and roadways affected for each energy development activity in each state, along with the broader impacts realized at the state level, led to using state-level rather than county- or regional-level data as normalizing factors.

first), and 18.30 (ranked first), respectively, for the same measures, for an average energy intensiveness rank of 1.3.

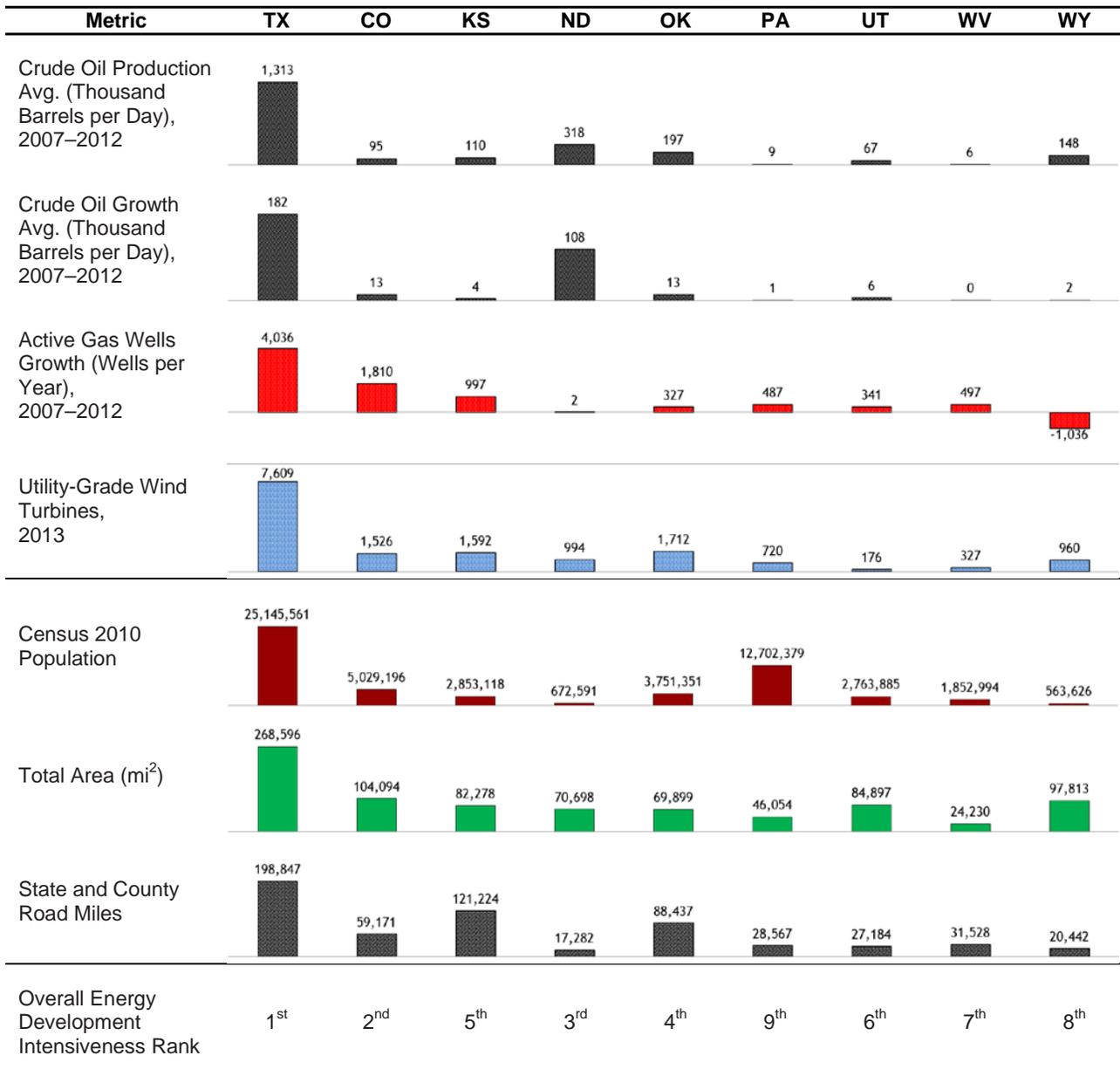
Table 36 lists energy development intensiveness scores for the top 10 continental U.S. states, including scores for crude oil production, crude oil growth (a proxy for crude oil well development), natural gas well development, and wind turbine development, as well as a combined score, which is the average score across energy categories. Most of the states with highly intensive energy development activity are located in the central United States, along with two states in the mid-Atlantic U.S. region. Table 37 shows a summary of these data and the overall intensiveness indicator rank for Texas and the energy development states that were included in this study.

Table 36. Energy Development Intensiveness Scores for Top 10 Continental U.S. States.

State	Energy Development Intensiveness Score* (Lower Number Is More Intensive)				
	Crude Oil Production	Crude Oil Growth	Natural Gas Well Growth	Wind Turbine Development	Combined Score
Texas	3.7	2.0	3.3	6.3	3.8
Colorado	10.0	5.0	1.3	9.0	6.3
North Dakota	1.3	1.0	19.0	5.3	6.7
Oklahoma	6.0	4.7	9.7	7.3	6.9
Kansas	9.7	7.7	5.0	7.3	7.4
Utah	9.0	5.7	7.3	18.7	10.2
West Virginia	17.7	12.0	2.7	13.0	11.3
Wyoming	3.7	7.0	31.3	6.3	12.1
Pennsylvania	18.7	12.3	6.7	12.0	12.4
New Mexico	5.3	3.7	31.7	13.7	13.6

*Intensiveness scores for each category account for differences in state area, population, and roadway mileage.

Table 37. Intensiveness Indicator Rank for Top Energy Development States.



Appendix B: Pennsylvania DOT Posted and Bonded Roadway Program

Information about Pennsylvania's Posted and Bonded Roadway program can be found at <http://www.papostedroads.pa.gov/>.

According to the website:

A posted roadway is any state or locally owned highway that has a weight restriction. The need for a weight restriction is determined through an engineering and traffic study (*Publication 46*) which examines the existing roadway conditions, including the pavement structure. The study will determine if increased traffic would weaken a roadway and therefore if the roadway should be posted.

If a hauler wants to utilize a posted roadway, they must determine if they classify as local traffic or qualify for local determination. If they do not qualify for either of these classifications, the hauler can apply for a permit which requires an Excess Maintenance Agreement (EMA) with a bond.

An EMA ensures that the hauler completes any maintenance beyond the normal routine work. If the hauler does not complete the required maintenance, then their permit will be suspended. As part of the EMA and bonding process, an on-site inspection is completed by PennDOT to document the pre-existing condition of the roadway.

Depending on the type of hauling operation, one of the three types of permits is selected. For more information please review *Publication 23, Chapter 15* of the Maintenance Manual that details the permitting requirements.

Step-by-Step Guide to Bonding a Posted Road in Pennsylvania: (71)

1) Contact PennDOT	The hauler contacts the PennDOT District Posting and Bonding Coordinator.
2) Initiate Agreement	Initiate Excess Maintenance Agreement (EMA) with PennDOT. Requires hauler to provide security funds, and may require a maintenance plan.
3) Identify Roads	Identify the state owned posted road(s) on which the hauler is requesting permit(s).
4) Agreement Executed	PennDOT processes and executes EMA.
5) Maintenance Plan	Complete and submit a maintenance plan as required by the EMA and/or at the Districts request. Contact the District to obtain the proper maintenance plan for regular or heavy USERS.
6) PennDOT Inspection	PennDOT conducts initial inspection to determine roadway existing state of repair prior to hauling (hauler may participate in the inspection).
7) Permit Determination	If approved, permit(s) issued.
8A) Roadway Condition Surveys	Weekly reviews of condition of roads, bonded by Heavy Users.
8B) Interim Inspections	PennDOT conducts interim inspections at its discretion.
9) Damage?	User contacted if there is damage which poses a hazard to the public. Based on option selected in EMA, hauler responsible to fix, OR Department will fix and bill hauler.
10) Prompt Repairs	When contacted, hauler must promptly perform repairs to the damage posing a hazard to the public. If no response or response not timely, hauling permit suspended. PennDOT may elect to make repairs and bill user.
11) Hauling Complete	Hauler notifies PennDOT in writing when hauling is ended and after repairs are completed.
12) Final Inspection	PennDOT conducts final inspection to verify acceptable roadway condition maintenance for which the hauler is liable under the EMA.
13) Hauler Billed	PennDOT bills hauler for any cost recovery items (damage repair, inspections, roadway condition surveys, plan reviews, construction inspection, etc.)
14) Agreement Release	All excess maintenance must be performed and all billable costs must be paid before EMA/permit can be released.
15) Funds Released	If exiting EMA/permit entirely, security funds are released.

Appendix C: Pennsylvania DOT Posted and Bonded Road Agreement Forms

WEIGHT RESTRICTED HIGHWAYS PROGRAM

PLEASE TYPE OR PRINT ALL INFORMATION IN BLUE OR BLACK INK



pennsylvania
DEPARTMENT OF TRANSPORTATION
www.dot.state.pa.us

Effective Date: _____
(Date to be filled in by Department)

AGREEMENT NO. : _____

FEDERAL ID NO. : _____

MPMS/ECMS NO. : _____

CONTRIBUTION AGREEMENT

THIS AGREEMENT, made and entered into by and between the Commonwealth of Pennsylvania, Department of Transportation ("DEPARTMENT"), located at

And

With offices located at

WITNESSETH:

WHEREAS, the DEPARTMENT and the CORPORATION have agreed to enter into this Agreement for State highway repair and/or reconstruction at the following locations (the Project):

County	State Route (S.R.)	Begin Sta.	End Sta.	Begin Segment/Offset	End Segment/Offset

WHEREAS, the CORPORATION has offered to contribute funds to the DEPARTMENT's Project because it desires to improve the State highway right-of-way to a condition that is suitable for the vehicles and heavy equipment that will use it for access to the CORPORATION's proposed commercial operations; and,

WHEREAS, the DEPARTMENT is willing to perform the Project, with its own forces or by contract, subject to reimbursement by the CORPORATION as provided in this Agreement; and

WHEREAS, the Project is estimated to cost \$ _____;

And

WHEREAS, the DEPARTMENT, by reason of its exclusive authority and jurisdiction over all State-designated highways, as conferred by Section 2002(a)(10) of the Administrative Code of 1929, as amended, 71 P.S. § 512(a)(10); its authority to issue permits for the opening of the surface of State highways, as conferred by Section 420 of the State Highway Law of 1945, 36 P.S. 670-420; and its authority to condition access to weight-restricted State highways on such undertakings necessary to cover the costs of repair and restoration pursuant to 75 Pa.C.S. 4902, is enabled to authorize and permit the CORPORATION's activities, uses, and entries made pursuant to this Agreement; and,

WHEREAS, the parties desire to enter into this Agreement to set forth their respective obligations and responsibilities for the Project.

NOW THEREFORE, for and in consideration of the foregoing premises and the mutual promises set forth below, the parties agree, with the intention of being legally bound, to the following terms, conditions, and provisions:

1. The recitals set forth above are incorporated by reference as a material part of this Agreement.
2. The DEPARTMENT, by contract or with its own forces, shall design and construct the Project in accordance with policies, plans, procedures and specifications prepared and/or approved by the DEPARTMENT, which are incorporated herein by reference as if physically attached hereto.
3. The DEPARTMENT shall, with its own forces or by contract, provide staff to adequately inspect and supervise construction work on the Project, in accordance with the approved plans and specifications.
4. The CORPORATION shall pay to the DEPARTMENT, in full upon execution of this Agreement or in monthly installments as specified in paragraph 6 below.:
 - (a) _____ Percent (_____ %) of the actual costs associated with the Project, estimated to be \$ _____. The CORPORATION understands that this is an estimate and that the actual costs may exceed this amount; OR
 - (b) A total amount of \$ _____.
5. During design and construction of the Project, the DEPARTMENT shall submit monthly invoices to the CORPORATION specifying the items constituting the total cost the CORPORATION is obligated to pay, and the CORPORATION shall make payment to the DEPARTMENT in full within forty-five (45) days of receipt of such invoice.

6. The DEPARTMENT may terminate this Agreement if funds are not provided for the Project. Termination shall be effected by delivery to the CORPORATION of a Notice of Termination specifying the reason for termination and the date such termination is to be effective. The CORPORATION shall compensate the DEPARTMENT for work performed or for services provided prior to the date of the Notice of Termination.

7. Unless otherwise agreed to by the parties in writing, in addition to the CORPORATION's reimbursement obligations under preceding Paragraph No. 4, the CORPORATION shall, where applicable, indemnify, save harmless and (if requested) defend the DEPARTMENT, its agents and employees from, and be solely responsible for, the payment and satisfaction of all awards, judgments, claims, costs and damages, including costs of appraisers and attorneys, witness fees, and other court costs and expenses resulting from the following:
 - (a) Changes required to be made to the DEPARTMENT's approved plans and/or specifications for the Project made necessary by requests by and for the CORPORATION.

 - (b) Time delays and extensions of time or termination of construction work on the Project requested or caused by the CORPORATION.

 - (c) Right-of-way and other property damages resulting from the acquisition and/or condemnation of the lands necessary for the construction of the Project. Right-of-way and other property damages, as used in this paragraph, shall include, but not be limited to, consequential damages; damages arising from de facto or inverse takings; special damages for displacement; damages for the preemption, destruction, alteration, blocking and diversion of facilities; and any other damages that may be claimed or awarded within the purview of the Eminent Domain Code of 1964, as amended, the State Highway Law of 1945, as amended, and/or eminent domain case law of the Commonwealth of Pennsylvania; and claims awarded or entered against the DEPARTMENT and/or the CORPORATION.

 - (d) Relocation of utility facilities, including but not limited to, gas, water, railroad, sewer, electric, telecommunications or drainage facilities, in the Project area and made necessary by the Project, to the extent that those damages are made necessary by requests by and/or for the CORPORATION.

 - (e) Preparation or revisions of environmental impact statements, negative declarations, environmental reports or other documents required by law and/or environmental litigation; public environmental hearings made necessary by the planning, design and/or environmental litigation; public environmental hearings made necessary by the planning, design and/or construction of the Project; and any or all increased planning, design, construction, utility relocation and right-of-way costs resulting therefrom, to the extent that those documents and hearings are made necessary by requests by and/or for the CORPORATION.

 - (f) All other unforeseen costs and expenses not included in the said estimate of construction costs for the Project, but which are directly related to or caused by the planning, design and/or construction of the Project, to the extent that those costs and expenses are made necessary by requests by and/or for the CORPORATION.

8. Unless the CORPORATION's contribution is paid as a lump sum before any design or construction work commences, the CORPORATION agrees to execute and deliver to the DEPARTMENT security to secure the performance of the CORPORATION's financial obligations under this Agreement, in one of the following forms: Performance Bond, Cashier's Check, Certified Check, Irrevocable Letter of Credit, or other security acceptable to the DEPARTMENT, in the amount of \$_____ . If the Project is performed by a contractor and the contract price, as bid and awarded, exceeds this estimate, the CORPORATION may be required to provide additional security up to the full amount of the contract price, plus an additional ten percent (10%) contingency, all at the DEPARTMENT's sole discretion. The DEPARTMENT may elect to postpone some or all of the work until the appropriate security has been delivered to the DEPARTMENT. Upon the CORPORATION's full contribution to the DEPARTMENT as required by this Agreement, the security required by this paragraph will be returned to the CORPORATION.
9. Nothing contained in the Agreement shall be deemed to be a waiver by the DEPARTMENT of its discretion to abandon or postpone the Project for any reason.
10. The CORPORATION agrees to comply with the *Contractor Integrity Provisions*, the *Commonwealth Nondiscrimination/Sexual Harassment Clause*, the *Provisions Concerning the Americans with Disabilities Act*, and the *Contractor Responsibility Provisions* which are attached hereto as Exhibits "A," "B," "C," and "D," respectively.
11. The Pennsylvania Right-to-Know Law, 65 P.S. §§ 67.101—3104, applies to this Agreement. Therefore, this Agreement is subject to, and the CORPORATION shall comply with, the clause entitled Contract Provisions – Right to Know Law 8-K-1532, attached as Exhibit "E" and made a part of this Agreement. As used in this Agreement, the term "Contractor" refers to the CORPORATION.
12. This Agreement will not be effective until all necessary Commonwealth officials as required by law have executed it. Following full execution, the DEPARTMENT will insert the effective date at the top of Page 1. This Agreement shall remain in effect until the Project is abandoned or completed, whichever occurs first.
13. This Agreement constitutes the entire Agreement between the parties and may not be modified or amended except in writing, and the rights and obligations hereunder may not be transferred or assigned without the prior written consent of the parties hereto.

IN WITNESS WHEREOF, the parties have executed this Agreement the date first above written.

ATTEST

CORPORATION

Title: DATE

BY _____
Title: DATE

If a Corporation, the President or Vice-president must sign and the Secretary, Treasurer, Assistant Secretary or Assistant Treasurer must attest; if a sole proprietorship, only the owner must sign; if a partnership, only one partner need sign; if a limited partnership, only the general partner must sign. If a Municipality, Authority or other entity, please attach a resolution.

DO NOT WRITE BELOW THIS LINE--FOR COMMONWEALTH USE ONLY

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

BY _____
Deputy Secretary of Transportation DATE

APPROVED AS TO LEGALITY
AND FORM

BY _____
for Chief Counsel Date

BY _____
Deputy General Counsel Date

BY _____
Deputy Attorney General Date

FUNDS COMMITMENT DOC. NO. _____
CERTIFIED FUNDS AVAILABLE UNDER
SAP NO. _____
SAP COST CENTER _____
GL. ACCOUNT _____
AMOUNT _____

BY _____
for Comptroller Date

COOPERATIVE PROJECT AGREEMENT

PLEASE TYPE OR PRINT ALL INFORMATION IN BLUE OR BLACK INK



County: _____ Agreement Number: _____
 Federal Id Number: _____ Project SR/SEG: _____
 Project Short Title: _____

THIS AGREEMENT, made and entered into this _____, Between the Commonwealth of Pennsylvania, acting through the Department of Transportation, hereinafter called the DEPARTMENT, located at:

And

having its principal address at

hereinafter called HAULER.

WITNESSETH:

WHEREAS, the DEPARTMENT has jurisdiction and control over State Route _____ and its right-of-way located in _____ Township, _____ County, Pennsylvania, hereinafter referred to as the "Highway," as more fully described in Exhibit "A," attached to and made part of this Agreement; and,

WHEREAS, the DEPARTMENT and the HAULER have agreed to enter into this Agreement for State highway repair and/or reconstruction at the following locations (the Project):

County	State Route (S.R.)	Begin Segment/Offset	End Segment/Offset

WHEREAS, the HAULER desires to perform the Project because it desires to improve the State highway right-of-way to a condition that is suitable for the vehicles and heavy equipment that will use it for access to the HAULER's proposed commercial operations; and,

WHEREAS, The HAULER has requested that the DEPARTMENT permit the HAULER, its employees, agents, representatives and contractors to enter the State highway right-of-way for the purpose of performing the Project; and,

WHEREAS, the DEPARTMENT, by reason of its exclusive authority and jurisdiction over all State-designated highways, as conferred by Section 2002(a)(10) of the Administrative Code of 1929, as amended, 71 P.S. § 512(a)(10), its authority to issue permits for the opening of the surface of State highways, as conferred by Section 420 of the State Highway Law of 1945, 36 P.S. 670-420, and its authority to condition access to weight-restricted State highways on such undertakings necessary to cover the costs of repair and restoration pursuant to 75 Pa.C.S. 4902, is enabled to authorize and permit the HAULER's activities, uses, and entries made pursuant to this Agreement; and,

WHEREAS, the DEPARTMENT requires that such use of the State highway right-of-way be subject to a written right of entry; and,

WHEREAS, independent of the HAULER's needs, the DEPARTMENT has determined that the Highway requires routine maintenance and repair to ensure the safety of the traveling public, consisting of

_____; and,

WHEREAS, rather than performing its project for routine maintenance, and then allowing the HAULER to tear it apart again to reconstruct or rehabilitate the road, the DEPARTMENT finds it in the best interests of the Commonwealth to retain the HAULER to perform the needed routine maintenance work as part of the Project; and,

WHEREAS, the DEPARTMENT's Deputy Secretary for Highway Administration has issued a sole source justification for contracting with the HAULER, recognizing that it is not feasible to award a contract on a competitive basis, and/or it is in the best interests of the DEPARTMENT and the Commonwealth to procure the services necessary to repair the Highway from the party that already plans to be working on the Highway; and,

WHEREAS, the DEPARTMENT has agreed to contribute a portion of the Project cost, and/or contribute materials, where such contribution and/or material value amount shall not exceed _____ Dollars (\$ _____); and,

WHEREAS, the HAULER has agreed to assume the remainder of the costs associated with the Project; and,

WHEREAS, the parties are entering into this Agreement to outline their respective responsibilities for the Project.

NOW, THEREFORE, in consideration of the premises, the mutual covenants hereinafter contained and with the intent to be legally bound hereby, the parties hereto agree as follows:

1. The foregoing recitals are incorporated herein by reference as though set forth at length.
2. All work done and materials furnished under and by virtue of this Agreement shall conform to and be governed by the plans and specifications prepared by the HAULER. The work shall be subject to the DEPARTMENT's approval and shall not begin until the approval has been granted. The Project design may be amended only upon written consent of the DEPARTMENT. The items of work as set forth in the plans and specifications for the Project are incorporated by reference as though physically attached to this Agreement.
3. Project design and construction shall be in such a manner as not to expose any member of the public to any hazardous or unsafe condition, and shall be in accordance with plans, policies, procedures, criteria and specifications prepared or approved by the DEPARTMENT, including, but not limited to, the most current versions of the following:
 - a. DEPARTMENT Publication No. 70M, *Guidelines for Design of Local Roads and Streets*;
 - b. DEPARTMENT Design Manuals (Publication Nos. 10, 10A, 13M, 14M, 15M, 16M and 24);
 - c. DEPARTMENT Strike-Off Letters;
 - d. DEPARTMENT Form No. 442, *Bureau of Design Specifications for Consultant Agreements*, Division I; and
 - e. DEPARTMENT Publication No. 408, *Specifications*, its supplements and amendments.
 - f. DEPARTMENT Publication 212, 67 Pa. Code Chapter 212, including provisions pertaining to work zone traffic control.
4. The HAULER covenants and warrants that all work and labor pursuant to this Agreement shall be done and performed by DEPARTMENT-prequalified contractors, in accordance with 36 P.S. 404.1 and 67 Pa. Code Chapter 457 in the best and most workmanlike manner, that prompt payment shall be made in full for all labor and materials used in the work and that all materials and labor shall conform strictly and fully in every respect to the plans and specifications.
5. The DEPARTMENT, with its own forces or by contract, shall provide staff to inspect and supervise adequately all construction and the HAULER shall be solely responsible for all costs and expenses associated with construction inspection , except to the extent that inspection activities and costs are identified below at paragraph 8(d) as a DEPARTMENT contribution, in which case the value of the inspection costs shall be identified in that paragraph and be subject to the not-to-exceed limitation . If any of the materials or labor destined for use or used within the State highway right-of-way are rejected by the DEPARTMENT as defective, unsuitable, or otherwise contrary to approvals, then those materials shall be removed and replaced with other approved materials; and the labor shall be performed anew to the DEPARTMENT's satisfaction and approval,

at the HAULER's cost and expense. The HAULER shall provide any and all documentation requested by the DEPARTMENT regarding the construction within seven (7) days of the request by the DEPARTMENT.

6. The HAULER shall arrange for any necessary relocation or adjustment for all utility facilities and shall notify each utility company to relocate any affected facilities to accommodate construction of the Project. Moreover, no relocation of utility lines within the DEPARTMENT's right-of-way shall be permitted without a highway occupancy permit issued by the DEPARTMENT to each of the affected utilities in accordance with 67 Pa. Code Chapter 459 and DEPARTMENT's Design Manual Part 5. The HAULER shall assure that the utility companies apply for and receive these permits from the DEPARTMENT. The HAULER shall obtain the requisite utility clearances.
7. The DEPARTMENT grants the HAULER, its employees, agents, representatives, and contractors a right of entry to the State highway right-of-way at such limited areas as are necessary for the construction of the Project, consistent with the terms and conditions of this Agreement. The DEPARTMENT shall be notified at least forty-eight (48) hours before the HAULER begins any work within the right-of-way, and the HAULER, its employees, agents, representatives, or contractors shall not interfere with DEPARTMENT operations.
8. The DEPARTMENT has agreed to contribute:
 - a. The amount of \$ _____
 - b. _____ percent of the Project cost,
 - c. The following materials: _____.
 - d. Other: _____
_____.

Where such monetary contribution, material value, and/or the value of any other contribution shall not exceed the total amount of _____ Dollars. The HAULER shall be responsible for all other Project costs and certifies that it has on hand sufficient funds to meet all of its obligations under this Agreement. Total Project costs are estimated to be - _____ Dollars.

9. The HAULER shall submit plans for the Project, which shall be subject to the approval of the DEPARTMENT, and once approved shall be the Final Plans. If necessary, the preparation of the Final Plans shall include the preparation of right-of-way plans, which in the DEPARTMENT's reasonable opinion, based on DEPARTMENT established procedures, are sufficient to describe all necessary right-of-way acquisitions. All required rights-of-way, substituted, abandoned or vacated will be shown on right-of-way acquisition plans.
10. The HAULER shall provide the DEPARTMENT with the final bid amount within five (5) business days of the opening of the bids. The scope and cost of work may not exceed the bid amount, except as provided in paragraph 11 below.

11. The Project shall be built in accordance with the Final Plans and any significant changes in the scope of work must be mutually agreed upon in writing as evidenced by the HAULER and the DEPARTMENT initialing a change order approving the change of work, provided that the HAULER shall hereby be authorized to proceed with and approve any change order where the cost associated with such individual change order does not exceed \$10,000.00. If the change order cost for each or any particular change exceeds \$10,000.00, the DEPARTMENT shall be presented with a change order request and the DEPARTMENT's consent to the change order shall be in its sole and absolute discretion, with consent not to be unreasonably withheld. Additionally, once the aggregate of change orders exceeds \$20,000.00, the HAULER and the DEPARTMENT shall promptly meet (within seven (7) business days) to discuss the change order needs. The DEPARTMENT may then require that (1) each and every subsequent change order over \$5,000.00 shall be presented to the DEPARTMENT for review and approval within three (3) business days of submission of said change order to the DEPARTMENT, with approval or disapproval in the DEPARTMENT's reasonable discretion or (2) to allow for a similar review process as provided herein. In the event that the DEPARTMENT does not approve any proposed change order, the DEPARTMENT shall notify the HAULER, in writing, of its disapproval within three (3) business days and the parties shall meet within one (1) business day after the notice is given in an effort to resolve the objection. In the event that no notice of disapproval is given, the change order shall be deemed approved. The parties shall use their respective best efforts to resolve any objection to a change order raised by the DEPARTMENT.
12. The HAULER agrees to construct the Project in accordance with the Final Plans, with construction work relative to the Project to begin within one calendar year from the execution date of this Agreement. The HAULER shall prepare a Project schedule, which shall be provided to each and every contractor hired by the HAULER and incorporated into each contract entered into relative thereto. If the anticipated start date cannot be met, the HAULER and the DEPARTMENT shall meet to discuss any delay in the beginning of construction and to resolve any and all delays in an effort to commence construction activities at the next earliest possible date.
13. It is the intent of the parties that their best efforts will be made in order to achieve construction in a timely manner consistent with the time tables set forth in the Final Plans, the bid documents, and the schedule.
14. The HAULER shall comply with all federal, state, and local laws, regulations, and ordinances in the conduct of its operations within the State highway right-of-way and shall be responsible for obtaining any and all required federal, state or local permits. The HAULER's obligations include, but are not limited to, responsibility for preparing and revising environmental impact statements, environmental assessments, categorical exclusions, environmental reports and other documents required by law or environmental litigation; the defense of environmental litigation resulting from the planning, design or construction of the Project; and proper environmental and erosion and sedimentation controls in accordance with Publication 408, Section 107. The HAULER shall also comply with the requirements of 25 Pa Code Chapter 102, *Erosion and Sediment Control and*

Stormwater Management, 25 Pa Code Chapter 92a, National Pollutant Discharge Elimination System Permitting, Monitoring and Compliance, 25 Pa. Code Chapter 105, Water Obstruction and Encroachment Permitting.

15. At the DEPARTMENT's request, the HAULER shall furnish to the DEPARTMENT evidence of the approvals, permits, licenses and approved environmental documents. If the HAULER is notified by any federal, state, or local agency that it is not in full compliance with any federal, state, or local law, regulation, or ordinance, associated with the construction and maintenance of any aspect of the Project, the HAULER shall immediately correct any such violation or deficiency and shall cease all operations until the HAULER is in full compliance. The HAULER shall provide the DEPARTMENT with written notice of any such notification.
16. The HAULER, at no cost to the DEPARTMENT, shall promptly provide the DEPARTMENT with copies of all laboratory results and reports compiled by its employees, agents, representatives, or contractors relating to the Project, that show the condition of the soil and the groundwater beneath the State highway right-of-way, or that detail any activity performed by the HAULER under this Agreement.
17. The HAULER shall assume full responsibility for involved utility facilities as provided by Act of December 10, 1974 (P.L. 852, No. 287) (73 P.S. 176-182), as amended, concerning protection of the public health and safety by preventing excavation or demolition from damaging underground utility facilities.
18. Upon completion of the Project by the HAULER or its contractor(s), the HAULER shall send to the DEPARTMENT a written notice of completion. Such notice of completion shall be deemed issued by the HAULER, if not actually provided to the DEPARTMENT within 30 days after the end of active construction. The DEPARTMENT shall, within 60 days, inspect and confirm, in writing, that the work, quantities, and documentation is acceptable. The DEPARTMENT's written acceptance shall constitute the written notice of acceptance as described below.
19. Provided that the work is acceptable, as evidenced by the DEPARTMENT's issuance of its acceptance, the HAULER shall invoice the DEPARTMENT for any amounts due and payable under this Agreement. Reimbursement shall be made in accordance with Commonwealth Management Directive 310.30, issued May 24, 2007, relating to the Pennsylvania Electronic Payment Program and the establishment of the Automated Clearing House Network ("ACH") as the Commonwealth's preferred method of payment. The following provisions apply:
 - a. The DEPARTMENT will make payment to the HAULER through ACH. Within 10 days of executing this Supplement Agreement, the HAULER must submit or must have already submitted its ACH information on a ACH enrollment form (obtained at www.vendorregistration.state.pa.us/cvmu/paper/Forms/ACH-EFTenrollmentform.pdf) to the Commonwealth's Central Vendor Management Unit at 717-214-0140 (FAX) or by mail to the Central Vendor Management Unit, Bureau of Financial Management, Verizon Tower—6th Floor, 303 Walnut Street, Harrisburg, PA, 17101-1830.

- b. The HAULER must submit a unique invoice number with each invoice submitted. The unique invoice number will be listed on the Commonwealth of Pennsylvania's ACH remittance advice to enable the HAULER to properly apply the state agency's payment to the respective invoice or program.
 - c. It is the responsibility of the HAULER to ensure that the ACH information contained in the Commonwealth's Central Vendor Master File is accurate and complete. Failure to maintain accurate and complete information may result in delays in payments.
20. Upon satisfactory completion of the Project and acceptance of the work as meeting the DEPARTMENT's standards and requirements, the DEPARTMENT shall resume its normal maintenance responsibilities as required under the State Highway Law, and in accordance with existing policies within the DEPARTMENT.
21. If the HAULER fails to comply with the terms of this Agreement to the DEPARTMENT's satisfaction, the DEPARTMENT may terminate the Agreement upon giving ten (10) days' written notice to the HAULER. If the Agreement is terminated for cause, then neither party shall be further obligated to the other, except to the extent that the HAULER shall restore the state highway to its pre-work conditions. If the restoration is not completed to the DEPARTMENT's satisfaction within thirty (30) days of the DEPARTMENT's demand, then the DEPARTMENT may perform the required restoration and the HAULER shall reimburse the DEPARTMENT for the cost of the work. The DEPARTMENT may also terminate upon giving ten (10) days' written notice to the HAULER if funds (state or federal) are not appropriated or otherwise made available to support continuation of performance in a subsequent fiscal year period, or for convenience, and if terminated for non-appropriation or convenience the HAULER shall receive payment, not to exceed the maximum amount set forth above, for the following, only to the extent that appropriated funds are available:
- a. all services performed consistent with the terms of the Agreement prior to the effective date of termination; and,
 - b. all actual and reasonable costs incurred by the HAULER as a result of the termination of the Agreement.

If any DEPARTMENT-contributed materials are not needed for the Project, the HAULER shall return those materials to the DEPARTMENT within 10 days of completion of work.

22. The HAULER shall, and shall require its contractor(s), subcontractor(s) and consultant(s) to provide the DEPARTMENT with a certificate of insurance evidencing coverage of injury, death, or property damage from any or all causes which may arise out of its presence on the State highway right-of-way in the minimum amounts of two-hundred-fifty-thousand dollars (\$250,000.00) per person and one-million dollars (\$1,000,000.00) in the aggregate (occurrence-based insurance). The Commonwealth of Pennsylvania and the DEPARTMENT shall be named as additional insured's on these policies.
23. The HAULER shall, and shall require its contractor(s), subcontractor(s) and consultant(s), to fully indemnify the COMMONWEALTH from any and all liability, loss, or damage that the COMMONWEALTH, its officers, agents and employees may suffer as a result of any and all claims, demands, costs, or judgments of any type made against the COMMONWEALTH as a result of granting this Agreement, including, but not limited to, fines,

penalties, claims, demands, costs, or judgments arising from the presence of the HAULER, its contractor(s), consultant(s) and/or their officers, agents, and employees or others within the State highway right-of-way or any work or other actions taken by any of them pursuant to or in violation of this Agreement, or as a result of any failure of any of them to conform to all pertinent statutes, ordinances, regulations, or other requirements of any governmental authority in connection with this Agreement. This provision is intended to include claims, demands, costs or judgments resulting from a negligent act or omission of the COMMONWEALTH, its officers, agents, and employees with respect to this Agreement or the subject thereof. The HAULER waives any immunity from liability to the COMMONWEALTH from damages, contribution or indemnity provided by Section 303 of the Worker’s Compensation Act, Act of June 2, 1915, P.L. 736, *as amended*, 77 P.S. §481. IT IS THE INTENT OF THIS PROVISION TO ABSOLUTELY ABSOLVE AND PROTECT THE COMMONWEALTH, ITS OFFICERS, AGENTS, AND EMPLOYEES FROM ANY AND ALL LOSS BY REASON OF THIS AGREEMENT.

The HAULER agrees to defend (if requested) the COMMONWEALTH, its officers, agents and employees, against any and all claims brought or actions filed against the COMMONWEALTH, either as an original or an additional defendant, with respect to the subject of the indemnity contained herein in the previous paragraph, whether such fines, penalties, claims or actions are rightfully or wrongfully brought or filed. The HAULER hereby waives any and all rights to join the COMMONWEALTH as an additional defendant in any actions arising as a result of the grant of this Agreement. Notwithstanding the foregoing provisions, The HAULER agrees that the DEPARTMENT may employ attorneys of its own selection to appear and defend any claims or actions on behalf of the DEPARTMENT.

- 24. The HAULER agrees to comply with the offset provisions, *Contractor Responsibility Provisions, Contractor Integrity Provisions, the Commonwealth Nondiscrimination/Sexual Harassment Clause and the Provisions Concerning the Americans with Disabilities Act*, which are attached hereto and made part hereof as Exhibits “B,” “C,” “D,” and “E,” respectively. The Pennsylvania Right-to-Know Law, 65 P.S. §§ 67.101—3104, applies to this Project Agreement. Therefore, this Agreement is subject to, and the HAULER shall comply with, the clause entitled Contract Provisions – Right to Know Law 8-K-1532, attached as Exhibit “F” and made a part of this Agreement. As used in this Agreement, the term “Contractor” refers to the HAULER.
- 25. The Pennsylvania Prevailing Wage Act requires that all workers on a “public work,” as defined in the Act, be paid the prevailing minimum wage determined by the Pennsylvania Department of Labor & Industry, Bureau of Labor Law Compliance. Act of August 15, 1961, P.L. 987, as amended, 43 P.S. §§ 165-1 - 165-17; 34 Pa. Code §§ 9.101-9.112. The HAULER shall comply with the Provisions Relating to the Pennsylvania Prevailing Wage Act, which is attached as Exhibit G and made a part of this Agreement. As used in this exhibit, the references to the contractor shall be to the HAULER, references to the Secretary shall be to the Secretary of Labor & Industry, and references to the contract shall be to this Agreement. The HAULER can obtain prevailing wage rates and information about compliance through the following:

Bureau of Labor Law Compliance
1301 Labor & Industry Building
Seventh & Forster Streets
Harrisburg, PA 17120-0019
717-787-4671
www.dli.state.pa.us

Lookup Keywords: “prevailing wage/apprenticeship” then “prevailing wage determination request”

The HAULER shall be responsible to maintain all documentation, particularly certified payrolls, showing compliance with the Prevailing Wage Act and to comply with all applicable provisions concerning minimum wage specifications and rates contained in section 107.22 of Publication 408, Specifications, which pertain to the Pennsylvania Prevailing Wage Act.

- 26. The HAULER shall comply with the Provisions Relating to Disadvantaged Businesses, which is attached as Exhibit H and made part of this Agreement. The DEPARTMENT'S participation in the Project is expressly conditioned on submission of a Disadvantaged Business Submittal, in the form and with the contents specified in that exhibit, prior to the commencement of any work on the Project. The DEPARTMENT shall have the option to withdraw its participation at any time if this submission is not forthcoming or is insufficient, as determined by the DEPARMTENT.
- 27. Notice under this Agreement shall be by First Class Certified United States Mail, Return Receipt Requested, postage prepaid or by overnight delivery service having positive tracking, such as Federal Express. Notice shall be deemed given when received, at the following addresses:

Notice to the HAULER shall be sent to:

Notice to the DEPARTMENT shall be sent to:

or to such other names or addresses as the parties may provide to each other in writing.

- 28. The HAULER agrees to reimburse the DEPARTMENT for any necessary expenses, attorneys' fees, or costs incurred in the enforcement of any part of this Agreement within ninety (90) days after receiving written notice that the DEPARTMENT has incurred them.

29. This Agreement shall not be considered to be authorization to the HAULER or its contractors to encroach on the property of others. If the HAULER must enter upon land situated outside the DEPARTMENT's right-of-way that is owned by a third party, the HAULER shall, at its own expense, secure any necessary authorization, release, or right of entry. The HAULER shall be required to provide evidence of permission to enter upon an abutting or adjoining property owner's land, if requested by the DEPARTMENT.
30. This Agreement, together with all exhibits and attachments annexed hereto, constitutes the entire understanding between the parties and completely expresses their intent. All prior or contemporaneous agreements are hereby merged into this document. This Agreement may not be modified or amended except in writing, and its rights and obligations may not be transferred or assigned without the prior written consent of the parties.
31. This Agreement shall not be effective until executed by all required Commonwealth officials. Upon full execution, the DEPARTMENT will insert the effective date of this Agreement on Page One.
32. Agreement No. _____ is split 0 %, expenditure amount of 0.00\$, for federal funds and 0%, expenditure amount of \$0.00, for state funds. The related federal assistance program name and number is N/A; . The state program name and number is Highway Maintenance; Appropriation 187/711 Maintenance Operations. This paragraph does not affect the costs to the HAULER.

IN WITNESS WHEREOF, the parties have executed this Agreement the date first above written.

ATTEST

HAULER

Signature DATE

BY _____
Signature DATE

Title:

If a Corporation, the President or Vice-president must sign and the Secretary, Treasurer, Assistant Secretary or Assistant Treasurer must attest; if a Sole Proprietorship, only the owner must sign; if a Partnership, only one partner need sign; if a Limited Partnership, only the general partner must sign. If a Municipality, Authority or other entity, please attach a resolution.

DO NOT WRITE BELOW THIS LINE--FOR COMMONWEALTH USE ONLY

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

BY _____
Deputy Secretary of Transportation DATE

APPROVED AS TO LEGALITY
AND FORM

BY _____
for Chief Counsel Date

CERTIFIED FUNDS AVAILABLE UNDER
FUNDS COMMITMENT NO.: _____
FUND: _____
COST CENTER: _____
G/L ACCOUNT: _____
AMOUNT: _____

BY _____
Deputy Attorney General Date

BY _____
for Comptroller Operations Date

BY _____
Deputy General Counsel Date

CONTRACTOR INTEGRITY PROVISIONS

It is essential that those who seek to contract with the Commonwealth of Pennsylvania (“Commonwealth”) observe high standards of honesty and integrity. They must conduct themselves in a manner that fosters public confidence in the integrity of the Commonwealth procurement process.

In furtherance of this policy, Contractor agrees to the following:

1. Contractor shall maintain the highest standards of honesty and integrity during the performance of this contract and shall take no action in violation of state or federal laws or regulations or any other applicable laws or regulations, or other requirements applicable to Contractor or that govern contracting with the Commonwealth.
2. Contractor shall establish and implement a written business integrity policy, which includes, at a minimum, the requirements of these provisions as they relate to Contractor employee activity with the Commonwealth and Commonwealth employees, and which is distributed and made known to all Contractor employees.
3. Contractor, its affiliates, agents and employees shall not influence, or attempt to influence, any Commonwealth employee to breach the standards of ethical conduct for Commonwealth employees set forth in the *Public Official and Employees Ethics Act, 65 Pa.C.S. §§1101 et seq.*; the *State Adverse Interest Act, 71 P.S. §776.1 et seq.*; and the [Governor’s Code of Conduct, Executive Order 1980-18, 4 Pa. Code §7.151 et seq.](#), or to breach any other state or federal law or regulation.
4. Contractor, its affiliates, agents and employees shall not offer, give, or agree or promise to give any gratuity to a Commonwealth official or employee or to any other person at the direction or request of any Commonwealth official or employee.
5. Contractor, its affiliates, agents and employees shall not offer, give, or agree or promise to give any gratuity to a Commonwealth official or employee or to any other person, the acceptance of which would violate the [Governor’s Code of Conduct, Executive Order 1980-18, 4 Pa. Code §7.151 et seq.](#) or any statute, regulation, statement of policy, management directive or any other published standard of the Commonwealth.
6. Contractor, its affiliates, agents and employees shall not, directly or indirectly, offer, confer, or agree to confer any pecuniary benefit on anyone as consideration for the decision, opinion, recommendation, vote, other exercise of discretion, or violation of a known legal duty by any Commonwealth official or employee.
7. Contractor, its affiliates, agents, employees, or anyone in privity with him or her shall not accept or agree to accept from any person, any gratuity in connection with the performance of work under the contract, except as provided in the contract.

8. Contractor shall not have a financial interest in any other contractor, subcontractor, or supplier providing services, labor, or material on this project, unless the financial interest is disclosed to the Commonwealth in writing and the Commonwealth consents to Contractor's financial interest prior to Commonwealth execution of the contract. Contractor shall disclose the financial interest to the Commonwealth at the time of bid or proposal submission, or if no bids or proposals are solicited, no later than Contractor's submission of the contract signed by Contractor.

9. Contractor, its affiliates, agents and employees shall not disclose to others any information, documents, reports, data, or records provided to, or prepared by, Contractor under this contract without the prior written approval of the Commonwealth, except as required by the *Pennsylvania Right-to-Know Law, 65 P.S. §§ 67.101-3104*, or other applicable law or as otherwise provided in this contract. Any information, documents, reports, data, or records secured by Contractor from the Commonwealth or a third party in connection with the performance of this contract shall be kept confidential unless disclosure of such information is:
 - a. Approved in writing by the Commonwealth prior to its disclosure; or
 - b. Directed by a court or other tribunal of competent jurisdiction unless the contract requires prior Commonwealth approval; or
 - c. Required for compliance with federal or state securities laws or the requirements of national securities exchanges; or
 - d. Necessary for purposes of Contractor's internal assessment and review; or
 - e. Deemed necessary by Contractor in any action to enforce the provisions of this contract or to defend or prosecute claims by or against parties other than the Commonwealth; or
 - f. Permitted by the valid authorization of a third party to whom the information, documents, reports, data, or records pertain: or
 - g. Otherwise required by law.

10. Contractor certifies that neither it nor any of its officers, directors, associates, partners, limited partners or individual owners has been officially notified of, charged with, or convicted of any of the following and agrees to immediately notify the Commonwealth agency contracting officer in writing if and when it or any officer, director, associate, partner, limited partner or individual owner has been officially notified of, charged with, convicted of, or officially notified of a governmental determination of any of the following:

- a. Commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements or receiving stolen property.
- b. Commission of fraud or a criminal offense or other improper conduct or knowledge of, approval of or acquiescence in such activities by Contractor or any affiliate, officer, director, associate, partner, limited partner, individual owner, or employee or other individual or entity associated with:
 - (1) obtaining;
 - (2) attempting to obtain; or
 - (3) performing a public contract or subcontract.

Contractor's acceptance of the benefits derived from the conduct shall be deemed evidence of such knowledge, approval or acquiescence.

- c. Violation of federal or state antitrust statutes.
- d. Violation of any federal or state law regulating campaign contributions.
- e. Violation of any federal or state environmental law.
- f. Violation of any federal or state law regulating hours of labor, minimum wage standards or prevailing wage standards; discrimination in wages; or child labor violations.
- g. Violation of the *Act of June 2, 1915 (P.L.736, No. 338)*, known as the *Workers' Compensation Act, 77 P.S. 1 et seq.*
- h. Violation of any federal or state law prohibiting discrimination in employment.
- i. Debarment by any agency or department of the federal government or by any other state.
- j. Any other crime involving moral turpitude or business honesty or integrity.

Contractor acknowledges that the Commonwealth may, in its sole discretion, terminate the contract for cause upon such notification or when the Commonwealth otherwise learns that Contractor has been officially notified, charged, or convicted.

- 11. If this contract was awarded to Contractor on a non-bid basis, Contractor must, (as required by *Section 1641* of the *Pennsylvania Election Code*) file a report of political

contributions with the Secretary of the Commonwealth on or before February 15 of the next calendar year. The report must include an itemized list of all political contributions known to Contractor by virtue of the knowledge possessed by every officer, director, associate, partner, limited partner, or individual owner that has been made by:

- a. Any officer, director, associate, partner, limited partner, individual owner or members of the immediate family when the contributions exceed an aggregate of one thousand dollars (\$1,000) by any individual during the preceding year; or
- b. Any employee or members of his immediate family whose political contribution exceeded one thousand dollars (\$1,000) during the preceding year.

To obtain a copy of the reporting form, Contractor shall contact the Bureau of Commissions, Elections and Legislation, Division of Campaign Finance and Lobbying Disclosure, Room 210, North Office Building, Harrisburg, PA 17120.

12. Contractor shall comply with requirements of the *Lobbying Disclosure Act, 65 Pa.C.S. § 13A01 et seq.*, and the regulations promulgated pursuant to that law. Contractor employee activities prior to or outside of formal Commonwealth procurement communication protocol are considered lobbying and subjects the Contractor employees to the registration and reporting requirements of the law. Actions by outside lobbyists on Contractor's behalf, no matter the procurement stage, are not exempt and must be reported.
13. When Contractor has reason to believe that any breach of ethical standards as set forth in law, the Governor's Code of Conduct, or in these provisions has occurred or may occur, including but not limited to contact by a Commonwealth officer or employee which, if acted upon, would violate such ethical standards, Contractor shall immediately notify the Commonwealth contracting officer or Commonwealth Inspector General in writing.
14. Contractor, by submission of its bid or proposal and/or execution of this contract and by the submission of any bills, invoices or requests for payment pursuant to the contract, certifies and represents that it has not violated any of these contractor integrity provisions in connection with the submission of the bid or proposal, during any contract negotiations or during the term of the contract.
15. Contractor shall cooperate with the Office of Inspector General in its investigation of any alleged Commonwealth employee breach of ethical standards and any alleged Contractor non-compliance with these provisions. Contractor agrees to make identified Contractor employees available for interviews at reasonable times and places. Contractor, upon the inquiry or request of the Office of Inspector General, shall provide, or if appropriate, make promptly available for inspection or copying, any information of any type or form deemed relevant by the Inspector General to Contractor's integrity and compliance with these provisions. Such information may include, but shall not be limited to, Contractor's

business or financial records, documents or files of any type or form that refers to or concern this contract.

16. For violation of any of these Contractor Integrity Provisions, the Commonwealth may terminate this and any other contract with Contractor, claim liquidated damages in an amount equal to the value of anything received in breach of these provisions, claim damages for all additional costs and expenses incurred in obtaining another contractor to complete performance under this contract, and debar and suspend Contractor from doing business with the Commonwealth. These rights and remedies are cumulative, and the use or non-use of any one shall not preclude the use of all or any other. These rights and remedies are in addition to those the Commonwealth may have under law, statute, regulation, or otherwise.
17. For purposes of these Contractor Integrity Provisions, the following terms shall have the meanings found in this Paragraph 17.
 - a. “Confidential information” means information that a) is not already in the public domain; b) is not available to the public upon request; c) is not or does not become generally known to Contractor from a third party without an obligation to maintain its confidentiality; d) has not become generally known to the public through a act or omission of Contractor; or e) has not been independently developed by Contractor without the use of confidential information of the Commonwealth.
 - b. “Consent” means written permission signed by a duly authorized officer or employee of the Commonwealth, provided that where the material facts have been disclosed, in writing, by pre-qualification, bid, proposal, or contractual terms, the Commonwealth shall be deemed to have consented by virtue of execution of this contract.
 - c. “Contractor” means the individual or entity that has entered into this contract with the Commonwealth, including those directors, officers, partners, managers, and owners having more than a five percent interest in Contractor.
 - d. “Financial interest” means:
 - (1) Ownership of more than a five percent interest in any business; or
 - (2) Holding a position as an officer, director, trustee, partner, employee, or holding any position of management.
 - e. “Gratuity” means tendering, giving or providing anything of more than nominal monetary value including, but not limited to, cash, travel, entertainment, gifts, meals, lodging, loans, subscriptions, advances, deposits of money, services,

employment, or contracts of any kind. The exceptions set forth in the [Governor's Code of Conduct, Executive Order 1980-18](#), the *4 Pa. Code §7.153(b)*, shall apply.

- f.** “Immediate family” means a spouse and any unemancipated child.
- g.** “Non-bid basis” means a contract awarded or executed by the Commonwealth with Contractor without seeking bids or proposals from any other potential bidder or offeror.
- h.** “Political contribution” means any payment, gift, subscription, assessment, contract, payment for services, dues, loan, forbearance, advance or deposit of money or any valuable thing, to a candidate for public office or to a political committee, including but not limited to a political action committee, made for the purpose of influencing any election in the Commonwealth of Pennsylvania or for paying debts incurred by or for a candidate or committee before or after any election.

NONDISCRIMINATION/SEXUAL HARASSMENT CLAUSE [Contracts]

The Contractor agrees:

- 1.** In the hiring of any employee(s) for the manufacture of supplies, performance of work, or any other activity required under the contract or any subcontract, the Contractor, each subcontractor, or any person acting on behalf of the Contractor or subcontractor shall not, by reason of gender, race, creed, or color, discriminate against any citizen of this Commonwealth who is qualified and available to perform the work to which the employment relates.
- 2.** Neither the Contractor nor any subcontractor nor any person on their behalf shall in any manner discriminate against or intimidate any employee involved in the manufacture of supplies, the performance of work, or any other activity required under the contract on account of gender, race, creed, or color.
- 3.** The Contractor and each subcontractor shall establish and maintain a written sexual harassment policy and shall inform their employees of the policy. The policy must contain a notice that sexual harassment will not be tolerated and employees who practice it will be disciplined.
- 4.** The Contractor and each subcontractor shall not discriminate by reason of gender, race, creed, or color against any subcontractor or supplier who is qualified to perform the work to which the contracts relates.
- 5.** The Contractor and each subcontractor shall, within the time periods requested by the Commonwealth, furnish all necessary employment documents and records and permit access to their books, records, and accounts by the contracting agency and the Bureau of Minority and Women Business Opportunities (BMWBO), for purpose of ascertaining compliance with provisions of this Nondiscrimination/Sexual Harassment Clause. Within fifteen (15) days after award of any contract, the Contractor shall be required to complete, sign and submit Form STD-21, the "Initial Contract Compliance Data" form. If the contract is a construction contract, then the Contractor shall be required to complete, sign and submit Form STD-28, the "Monthly Contract Compliance Report for Construction Contractors", each month no later than the 15th of the month following the reporting period beginning with the initial job conference and continuing through the completion of the project. Those contractors who have fewer than five employees or whose employees are all from the same family or who have completed the Form STD-21 within the past 12 months may, within the 15 days, request an exemption from the Form STD-21 submission requirement from the contracting agency.
- 6.** The Contractor shall include the provisions of this Nondiscrimination/Sexual Harassment Clause in every subcontract so that those provisions applicable to subcontractors will be binding upon each subcontractor.
- 7.** The Commonwealth may cancel or terminate the contract and all money due or to become due under the contract may be forfeited for a violation of the terms and conditions of this Nondiscrimination/Sexual Harassment Clause. In addition, the agency may proceed with debarment or suspension and may place the Contractor in the Contractor Responsibility File.

PROVISIONS CONCERNING THE *AMERICANS WITH DISABILITIES ACT*

For the purpose of these provisions, the term contractor is defined as any person, including, but not limited to, a bidder, offeror, supplier, or grantee, who will furnish or perform or seeks to furnish or perform, goods, supplies, services, construction or other activity, under a purchase order, contract, or grant with the Commonwealth of Pennsylvania (Commonwealth).

During the term of this agreement, the contractor agrees as follows:

1. Pursuant to federal regulations promulgated under the authority of the *Americans with Disabilities Act*, 28 C. F. R. § 35.101 et seq., the contractor understands and agrees that no individual with a disability shall, on the basis of the disability, be excluded from participation in this agreement or from activities provided for under this agreement. As a condition of accepting and executing this agreement, the contractor agrees to comply with the "General Prohibitions Against Discrimination," 28 C. F. R. § 35.130, and all other regulations promulgated under *Title II* of the *Americans with Disabilities Act* which are applicable to the benefits, services, programs, and activities provided by the Commonwealth through contracts with outside contractors.
2. The contractor shall be responsible for and agrees to indemnify and hold harmless the Commonwealth from all losses, damages, expenses, claims, demands, suits, and actions brought by any party against the Commonwealth as a result of the contractor's failure to comply with the provisions of paragraph 1.

EXHIBIT C

Contractor Responsibility Provisions

For the purpose of these provisions, the term contractor is defined as any person, including, but not limited to, a bidder, offeror, loan recipient, grantee or lessor, who has furnished or performed or seeks to furnish or perform, goods, supplies, services, leased space, construction or other activity, under a contract, grant, lease, purchase order or reimbursement agreement with the Commonwealth of Pennsylvania (Commonwealth). The term contractor includes a permittee, licensee, or any agency, political subdivision, instrumentality, public authority, or other public entity in the Commonwealth.

- 1.** The Contractor certifies, in writing, for itself and its subcontractors required to be disclosed or approved by the Commonwealth, that as of the date of its execution of this Bid/Contract, that neither the Contractor, nor any such subcontractors, are under suspension or debarment by the Commonwealth or any governmental entity, instrumentality, or authority and, if the Contractor cannot so certify, then it agrees to submit, along with its Bid/Contract, a written explanation of why such certification cannot be made.
- 2.** The Contractor also certifies, in writing, that as of the date of its execution of this Bid/Contract it has no tax liabilities or other Commonwealth obligations, or has filed a timely administrative or judicial appeal if such liabilities or obligations exist, or is subject to a duly approved deferred payment plan if such liabilities exist.
- 3.** The Contractor's obligations pursuant to these provisions are ongoing from and after the effective date of the Contract through the termination date thereof. Accordingly, the Contractor shall have an obligation to inform the Commonwealth if, at any time during the term of the Contract, it becomes delinquent in the payment of taxes, or other Commonwealth obligations, or if it or, to the best knowledge of the Contractor, any of its subcontractors are suspended or debarred by the Commonwealth, the federal government, or any other state or governmental entity. Such notification shall be made within 15 days of the date of suspension or debarment.
- 4.** The failure of the Contractor to notify the Commonwealth of its suspension or debarment by the Commonwealth, any other state, or the federal government shall constitute an event of default of the Contract with the Commonwealth.
- 5.** The Contractor agrees to reimburse the Commonwealth for the reasonable costs of investigation incurred by the Office of State Inspector General for investigations of the Contractor's compliance with the terms of this or any other agreement between the Contractor and the Commonwealth that results in the suspension or debarment of the contractor. Such costs shall include, but shall not be limited to, salaries of investigators, including overtime; travel and lodging expenses; and expert witness and documentary fees. The Contractor shall not be responsible for investigative costs for investigations that do not result in the Contractor's suspension or debarment.
- 6.** The Contractor may obtain a current list of suspended and debarred Commonwealth contractors by either searching the Internet at <http://www.dgs.state.pa.us/> or contacting the:

Department of General Services
Office of Chief Counsel
603 North Office Building
Harrisburg, PA 17125
Telephone No: (717) 783-6472
FAX No: (717) 787-9138

Appendix D: West Virginia DOT Oil and Gas Policy Memoranda



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

January 3, 2012

MEMORANDUM

TO: ALL DISTRICT ENGINEERS/MANAGERS

**FROM: PAUL A MATTOX, JR., P. E.
SECRETARY OF TRANSPORTATION/
COMMISSIONER OF HIGHWAYS**

A handwritten signature in blue ink that reads "Paul A. Mattox, Jr.".

SUBJECT: OIL AND GAS ROAD POLICY

Upon further review of the Interim Oil and Gas Roads Policy (Policy), the Division of Highways (DOH) recognizes a need to focus the scope of its Policy on those horizontal drilling operations that are anticipated to have significant impacts on State roadways and to ensure continued maintenance of the State's local roadways in light of heavy road traffic attendant to these types of oil and gas development operations. Additionally, coverage under this Policy extends to smaller oil and gas operations, primarily conventional drilling operations, which have significantly less potential to impact the condition of local roadways.

This Policy supersedes the policy dated February 1, 2011.

A. GENERAL:

1. The requirements set forth in this Policy shall apply to oil and gas operators as defined in WV Code §22-6-1(w).
2. The proposed project shall be identified as beginning with the onset of site preparation and concluding with the completion of well fracturing and reclamation at a site. Where more than one well is drilled at a site within a period of 12 months, the project will conclude with the completion of well fracturing for the last well and no additional wells are scheduled to be drilled or fractured for a period of at least 12 months.

OIL & GAS ROAD POLICY

January 3, 2012

Page Two

3. Bonding shall be required for only those highways classified as "state local service" roads in accordance with WV Code §17-1-28 and as defined in WV Code §17-4-2(d) (e.g., CR XX/X) (hereinafter referred to as "Covered Roads"). Highways that carry an interstate, state or corridor system designation are not Covered Roads and are not to be included in determining bonding amounts.
4. Permits for oversized/overweight vehicles are not subject to the conditions of this Policy and shall be handled through normal DOH procedures as identified in WV Code 17C-17 and legislative rules.
5. Definitions:
 - a) "Anticipated damage" is the added potential stress placed on a highway and/or structure due to the increased continuous use of the roadway by heavy vehicles.
 - b) "Gas and Oil Wells" means wells drilled for the purpose of extracting natural gas and/or oil as those terms are defined in WV Code §22-6-1(j) and (k).
 - c) "Required Major Improvements" are those modifications to Covered Roads that are necessitated by the high volumes of heavy traffic anticipated for a project and may include but are not limited to sight distance improvements, signage, signalization, road widening, construction of new roadways, and acquisition of rights-of-way.
 - d) "Restrictions" are requirements directed at the protection of the traveling public, including but are not limited to pilot cars, hours of operation, etc.

B. GAS AND OIL WELLS WITH 5,000+ BARRELS UTILIZED FOR DRILLING AND/OR STIMULATION ACTIVITIES:

1. The operator shall provide written notice to the appropriate district engineer/manager of its intent to conduct operations covered by this Policy at a location within the District. The written notice shall include the exact location of the proposed project along with the proposed routes to be used by the operator. Proposed routes may be changed during Drilling/Fracturing operations by an addendum added to the approved permit.

2. Within 14 days of the receipt of the notice provided pursuant to B.1, above, the district engineer/manager, or his appointed representative, shall conduct an on-site meeting with the operator, or his appointed representative, to determine if the roadway is designed to meet the requirements of both the operator and the DOH. The operator shall provide a 24 hour point-of-contact for use by the DOH.
3. The route shall be filmed if at all possible before commencement of the project.
4. Within one month of the on-site meeting, the DOH shall negotiate with the operator to secure an Agreement addressing the permit that will be provided from the DOH and defining the responsibilities of both parties and which shall include, at a minimum, any Required Major Improvements before, during and after the operator has completed the well fracturing. Any work within the DOH right-of-way shall be performed to DOH standards and specifications and subject to DOH final approval.
5. The Agreement may stipulate any appropriate Restrictions and shall require a bond.
6. Upon conclusion of the project, the operator shall notify the DOH to schedule an on-site meeting to determine if the conditions of the Agreement have been met. Such meeting shall be held within 14 days of the receipt of such notice by the DOH and, if it is determined that the conditions of the Agreement have been met, any bonding applicable to the project shall be promptly released.
7. The DOH shall provide the operator with a permit stipulating that covered roads shall be maintained in accordance with the OIL AND GAS BONDING AGREEMENT.

C. GAS AND OIL WELLS WITH LESS THAN 5,000 BARRELS OF LIQUIDS UTILIZED FOR DRILLING AND/OR STIMULATION ACTIVITIES:

1. The operator shall provide written notice to the appropriate district engineer/manager of its intent to conduct operations covered by this Policy at a location within the District. The written notice shall include the exact location of the proposed project along with the proposed routes to be used by the operator. Proposed routes may be changed during Drilling/Fracturing operations by an addendum added to the approved permit.

2. Within two days of receipt of the notice required by C.1, above, the DOH shall contact the operator, or his representative, to review the road, if necessary, and determine if the road meets the needs for the project.
3. The operator shall provide a 24 hour point-of-contact for use by the DOH.
4. The DOH shall provide the operator with a permit stipulating that the road shall be maintained equal to or better than the original condition.

D. SECURITY

1. SINGLE BONDS

- a) For operators of wells with 5,000+ barrels of liquids utilized for drilling and/or stimulation activities covered by Section B, above, bonding shall be based on the degree of Anticipated Damage to Covered Roads up to the following maximum amounts:

<u>BOND</u>	<u>ROAD TYPE</u>
\$100,000	Paved Mile
\$ 35,000	Tar and Chipped Mile
\$ 25,000	Graveled Mile

- b) For operators of wells with less than 5,000 barrels of liquids utilized for drilling and/or stimulation activities covered by Section C, above, bonding shall be based on the degree of Anticipated Damage to Covered Roads up to a maximum amount of \$5,000 per well.

2. BLANKET BONDS

- a) In the alternative to D.1.a., operators of wells with 5,000+ barrels of liquids utilized for drilling and/or stimulation activities covered by Section B, above, may elect to post either a (a) district wide or (b) statewide blanket bond amount to cover multiple roads. The maximum blanket bond shall be \$250,000 per district or \$1,000,000 statewide.
- b) In the alternative to D.1.b., operators of wells with less than 5,000 barrels of liquids utilized for drilling and/or stimulation activities covered by Section C, above, may elect to post a maximum statewide blanket bond of \$50,000.

- c) Should the operator elect to use blanket bonding, projects may be added/deleted as they are initiated/completed. The DOH shall be provided with written notification of any changes to the blanket bond. Once a project has been completed and notification to DOH provided, there shall be no further liability under the bond for such project.
 - d) All agreements utilizing blanket bonds are negotiable and shall be handled by the DOH Central Office in Charleston.
- 3. **FORMS OF SECURITY:** The form of the bond(s) described in D.1 and D.2, above, shall be approved by the DOH. The forms of security provided pursuant to this Policy may include, at the option of the operator, surety bonding, collateral bonding (including cash and securities), letters of credit, establishment of an escrow account, self-bonding, or a combination of these methods.
- 4. Should damages attributable to the operator's activities occur on a secured road, the DOH shall contact the operator to agree upon the appropriate method of repair:
 - a) Operator repairs the roadway to the DOH standards and specifications;
 - b) DOH repairs the road with reimbursement by the operator; or
 - c) DOH seeks reimbursement from the pledged security.
- 5. Provided that the requirements of any Agreement executed in accordance with this Policy have been met, or, where no Agreement is required by this Policy and the condition of the Covered Roads at the conclusion of the project is at least as good as before the commencement of the project, normal wear and tear excepted, the DOH will promptly return the security upon written notice that the operator has:
 - a) Completed the project identified in the single project or
 - b) When notified that all projects under a blanket bond are complete and the operator anticipates no further work under the blanket bond.
- 6. The DOH reserves the right to pursue an operator for damages attributable to the operator's activities that exceed the bonded amount. The DOH further reserves the right to pursue the assistance

of the operator with regard to damages which can be attributed to the project on all routes. Said assistance may include the operator repairing or assisting in the repair of any damages that can be identified as a result of the project.

E. MULTIPLE OPERATORS SHARING A COMMON ROADWAY

In the event that damages occur on a shared section of roadway, the DOI shall seek an equitable reimbursement from all persons whose operations or activities have contributed to road damages. A determination of reimbursement levels shall take into consideration the number of trips/loads and associated weights attributable to each operation/activity and a credit shall be provided for any improvements funded by an operator.

F. NIGHTTIME TRAVEL

Nighttime hauling of oversized loads may be authorized in writing by the State Highway Engineer in certain circumstances to improve traffic safety.

G. APPEAL PROCESS

Should the operator and the district representative not reach agreement on the conditions to be stipulated in the Agreement or permit or on an equitable allocation under Sec. E, the operator may progressively appeal to:

1. District Engineer/Manager
2. Central Office Coordinator
3. State Highway Engineer
4. Commissioner of Highways

H. TERMINATION

This policy shall remain in effect until amended or modified.

PAM:Mb

cc: AC, CH, CHH, LL, HD, HO, OM



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

Division of Highways

1900 Kanawha Boulevard East • Building Five • Room 110
Charleston, West Virginia 25305-0430 • (304) 558-3505

February 5, 2013

MEMORANDUM

TO ALL DISTRICT ENGINEERS/MANAGERS

FROM: PAUL A MATTOX, JR., P. E.
SECRETARY OF TRANSPORTATION/
COMMISSIONER OF HIGHWAYS

A handwritten signature in blue ink that reads "Paul A. Mattox, Jr.".

SUBJECT: OIL AND GAS ROAD POLICY ADDENDUM

Upon further review of the Oil and Gas Roads Policy dated January 3, 2012 (Policy), the Division of Highways (DOH) recognizes a need to expand the scope of its Policy to include pipeline and compressor station operations that are anticipated to have significant impacts on State roadways and to ensure continued maintenance of the State's local roadways in light of heavy road traffic attendant to these types of oil and gas development operations.

This Policy Addendum hereby supplements the Policy, as follows:

A. GENERAL:

1. The requirements set forth in this Policy Addendum shall be limited to oil and gas companies engaged in the developing and constructing of gather lines facilities, midstream gas transmission infrastructure, or compress facilities; shall not supersede an existing pipeline's integrity management program; and, subsequently shall not preference existing pipeline systems in comparison to future development. This does not prevent the Facilities Owner/Operator from performing routine maintenance. In an emergency situation, the Facilities Owner/Operator will notify the DOH as soon as reasonably possible.
2. Bonding shall be required for only those highways classified as "state local service" roads in accordance with WV Code §17-1-28 and as defined in WV Code §17-4-2(d) (e.g., CR XX/X) (hereinafter referred to as "Covered Roads"). Highways that carry an interstate, state or corridor system designation are not Covered Roads and shall not be included in determining bonding amounts.

MEMORANDUM – OIL AND GAS ROAD POLICY ADDENDUM

February 5, 2013

Page Two

3. Permits for oversized/overweight vehicles are not subject to the conditions of this Policy Addendum and shall be handled through applicable DOH procedures as identified in WV Code 17C-17 and legislative rules.
4. Definitions:
 - a) “Anticipated Damage” is the added potential stress placed on a highway and/or structure due to the road degradation created during pipeline installation and usage and also due to the increased temporary use of the Covered Roads by heavy vehicles.
 - b) “Proposed Project” is limited to new major construction or major pipeline replacement (not routine maintenance) due to which Anticipated Damage and corresponding Required Major Improvements to Covered Roads may be reasonably foreseen. Proposed Project shall be defined as beginning with site clearing and continuing until site reclamation.
 - c) “Required Major Improvements” are those modifications to Covered Roads that are necessitated by traffic anticipated for a Proposed Project and may include but are not limited to sight distance improvements, signage, signalization, road widening, construction of new roadways, and acquisition of rights-of-way; provided, however, said modifications shall be limited to those improvements deemed necessary to maintain the roadway in a condition as good as before commencement of the project. If appropriate, Owner may enter into an Improvement Project in order to provide clear travel.
 - d) “Facilities Owner/Operator” is a company engaged in the developing, constructing and gathering lines, midstream gas transmission infrastructure, or compressor.
 - e) “Restrictions” are requirements directed at the protection of the traveling public, including, but are not limited to, pilot cars, hours of operation, etc.

B. PERMIT APPLICATION REQUIREMENTS:

1. The Facilities Owner/Operator shall provide written notice to the appropriate district engineer/manager of its intent to engage in a Proposed Project covered by this Policy Addendum at a location within the subject District. The written notice shall include the exact location of the Proposed Project along with the proposed routes to be used by the contractor for access. Proposed routes may be changed during construction operations by an addendum added to the approved permit.

MEMORANDUM – OIL AND GAS POLICY ADDENDUM

February 5, 2013

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2. Within 10 business days of the receipt of the notice provided pursuant to B.1, above, the district engineer/manager, or his appointed representative, shall conduct an on-site meeting with the operator, or his appointed representative, to determine if the roadway meets the requirements of both the Facilities Owner/Operator and the DOH. The Facilities Owner/Operator shall provide a 24 hour point-of-contact for use by the DOH.
3. Within 10 business days of the meeting contemplated in B.2. above, the route shall be filmed by DOH [or Facilities Owner/Operator at the discretion of DOH] and an inspection report shall be written documenting the condition of the route along with a good-faith estimate of depreciation being caused by other industrial vehicles of similar weight and size. The Facilities Owner/Operator shall have the opportunity to review the video and inspection report in order to propose comments or revisions associated therewith.
4. Within 20 business days of the on-site meeting, the DOH shall negotiate with the Facilities Owner/Operator to secure an Oil and Gas Bonding Agreement (“Agreement”) defining the responsibilities of both parties which shall include, at a minimum, any Required Major Improvements before, during and after the Facilities Owner/Operator has completed the Proposed Project; provided, however, the responsibility of the Facilities Owner/Operator shall be limited to its percentage share of any Required Major Improvements based upon the good-faith estimate contemplated in B.3. above. Any work within the DOH right-of-way shall be consistent with DOH standards and specifications and subject to DOH final approval.
5. The DOH shall provide the Facilities Owner/Operator with a permit stipulating that Covered Roads shall be maintained in accordance with the Agreement.
6. The Agreement may stipulate any appropriate Restrictions and shall require a bond.
7. Upon completion of the Proposed Project, the Facilities Owner/Operator shall notify the DOH. Thereafter, the DOH shall have a period of fourteen days to schedule an on-site meeting to determine if the conditions of the Agreement have been fulfilled. If it is determined that the conditions of the Agreement have been fulfilled, any bonding applicable to the Proposed Project shall be promptly released. If, however, it is determined by the DOH that any condition of the Agreement has not been fulfilled, the DOH shall prepare a written notification of objection to release of bonding, which, at a minimum, shall cite each specific contention that must be fulfilled by the Facilities Owner/Operator prior to release of the bonding applicable to the Proposed Project.

MEMORANDUM - OIL AND GAS POLICY ADDENDUM

February 5, 2013

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8. Any crossing of a DOH Right of Way by pipelines shall be in accordance with the manual for ACCOMODATION OF UTILITIES ON HIGHWAY RIGHT OF WAY or approved otherwise by the State Highway Engineer or his designee.
9. Access to the roadway at crossing sites, staging areas, storage sites, and compressor stations shall be in accordance with the MANUAL ON RULES AND REGULATIONS FOR CONSTRUCTING DRIVEWAYS ON STATE HIGHWAY RIGHTS-OF-WAY or approved otherwise by the State Highway Engineer or his designee.
10. The Facilities Owner/Operator shall be responsible for the development and maintenance of a traffic plan which shall be approved by the District Traffic Engineer. The Facilities Owner/Operator shall be responsible to provide all signing required for work zones, road closures, and detours. The Facilities Owner/Operator shall be responsible for public notification of closures.
11. When Facilities Owner/Operator impedes traffic for more than one hour, the Facilities Owner/Operator may be assessed a fine by enforcement personnel of all costs associated with exceeding the one hour time limit. Incidents that require the use of law enforcement or emergency services personnel are not subject to the one-hour time limit.

C. SECURITY:

1. SINGLE BONDS

For an individual Proposed Project covered by Section B above, bonding shall be based on the degree of Anticipated Damage to Covered Roads up to the following maximum amounts:

BOND	ROAD TYPE
\$100,000	Paved Mile
\$ 35,000	Tar and Chipped Mile
\$ 25,000	Graveled Mile

2. BLANKET BONDS

- a) As an alternative to C.1.a, Facilities Owner/Operator may elect to post either a (a) district wide or (b) statewide blanket amount to cover multiple roads. The maximum blanket bond shall \$250,000 per district or \$1,000,000 statewide and shall require a road maintenance agreement to be executed.

MEMORANDUM – OIL AND GAS POLICY ADDENDUM

February 5, 2013

Page Five

- b) Should the Facilities Owner/Operator elect to use blanket bonding, projects may be added/deleted as they are initiated/completed. The DOH shall be provided with written notification of any changes to the blanket bond. Once a Proposed Project has been completed and the DOH finds the roadway to be acceptable, the DOH shall remove the Project from the blanket bond.
- c) All agreements utilizing blanket bonds are negotiable and shall be handled by the DOH Central Office in Charleston.

3. FORMS OF SECURITY:

The form of the bond(s) described in C.1 and C.2, above, shall be approved by the DOH. The forms of security provided pursuant to this Policy Addendum may include, at the option of the contractor, surety bonding, collateral bonding (including cash and securities), letters of credit, establishment of an escrow account, self-bonding, or a combination of these methods.

D. DAMAGE:

Should damages attributable to the Facilities Owner/Operator activities occur on a secured road, the DOH shall contact the Facilities Owner/Operator to agree upon the appropriate method of repair:

1. The Facilities Owner/Operator repairs the roadway to the DOH standards and specifications;
2. DOH repairs the road with reimbursement by Facilities Owner/Operator; or
3. DOH seeks reimbursement from the pledged security.

E. RELEASE OF SECURITY:

Provided that the requirements of any Agreement executed in accordance with this Policy Addendum have been met, or, where no Agreement is required by this Policy Addendum and the condition of the Covered Roads at the conclusion of the Proposed Project is at least as good as before the commencement of the Proposed Project, normal wear and tear excepted, the DOH will promptly return the security upon written notice that the Facilities Owner/Operator has:

1. Completed the Proposed Project identified in the single project; or
2. Notified the DOH that all Proposed Projects under a blanket bond are complete and the Facilities Owner/Operator anticipates no further work under the blanket bond.

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The DOH reserves the right to pursue a Facilities Owner/Operator for damages attributable to the Facilities Owner/Operator's activities that exceed the bonded amount. The DOH further reserves the right to pursue the assistance of the Facilities Owner/Operator with regard to damages which can be attributed to the project on all routes. Said assistance may include the Facilities Owner/Operator repairing or assisting in the repair of any damages that can be identified as a result of the project.

F. MULTIPLE OPERATORS SHARING A COMMON ROADWAY

In the event that damages occur on a shared section of roadway, the DOH shall seek an equitable reimbursement from all persons whose contractors or activities have contributed to road damages. A determination of reimbursement levels shall take into consideration the number of trips/loads and associated weights attributable to each operation/activity and a credit shall be provided for any improvements funded by a Facilities Owner/Operator.

G. NIGHT TIME TRAVEL

Night time hauling of oversized loads may be authorized in writing by the State Highway Engineer in certain circumstances to improve traffic safety.

H. APPEAL PROCESS

Should the Facilities Owner/Operator and the district representative not reach agreement on the conditions to be stipulated in the Agreement or permit or on an equitable allocation under Sec. E, the operator may progressively appeal to:

1. District Engineer/Manager
3. Central Office Coordinator
4. State Highway Engineer
5. Commissioner of Highways

I. TERMINATION

This policy shall remain in effect until amended or modified.

PAM:Hb

cc: AC, CH, LL, HD, HO, OM
Marvin Murphy
Kathy Holtsclaw
Gary Clayton

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