Local fiscal effects of oil and gas development in eight states

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About this report

This report is part of a series produced by the authors on shale public finance, supported by the Alfred P. Sloan Foundation. The Shale Public Finance project is examining the financial implications for local governments associated with increased domestic oil and gas production, largely from shale resources. Previous reports have examined local government fiscal impacts in Arkansas, Colorado, Louisiana, Montana, North Dakota, Pennsylvania, Texas, and Wyoming, and revenue collection and allocation in those states. For more information, to view interactive maps showing some of our key findings, or to be notified when new publications are released, visit http://energy.duke.edu/shalepublicfinance.

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Table of Contents

Abstract ................................................................................................................................. 1

1. Report summary .................................................................................................................. 2
   1.1 Local government revenues associated with oil and gas development ......................... 3
   1.2 Local government costs associated with oil and gas development ............................... 4
   1.3 Summary of findings in eight states .............................................................................. 5
      1.3.1 Alaska .................................................................................................................. 5
      1.3.2 California ............................................................................................................ 6
      1.3.3 Kansas ................................................................................................................ 6
      1.3.4 New Mexico ....................................................................................................... 7
      1.3.5 Ohio ..................................................................................................................... 7
      1.3.6 Oklahoma ........................................................................................................... 7
      1.3.7 Utah .................................................................................................................... 8
      1.3.8 West Virginia ...................................................................................................... 8
      1.3.9 Summary of major local government revenues and costs in eight states .............. 9
   1.4 Summary of key findings ............................................................................................... 10
   1.5 Summary of methodology ............................................................................................ 11

2. Introduction and background ............................................................................................... 13
   2.1 Methodology ............................................................................................................... 13

3. Revenues, costs, and net fiscal impacts .............................................................................. 17
   3.1 Alaska .......................................................................................................................... 17
      3.1.1 Anchorage and Kenai Peninsula region, AK ......................................................... 18
      3.1.2 North Slope region, AK .................................................................................... 25
   3.2 California ...................................................................................................................... 29
      3.2.1 Los Angeles basin region, CA ............................................................................ 30
      3.2.2 Kern County region, CA ................................................................................... 35
   3.3 Kansas .......................................................................................................................... 39
      3.3.1 Mississippian Lime region, KS ........................................................................... 41
      3.3.2 Hugoton region, KS ............................................................................................ 48
   3.4 New Mexico .................................................................................................................. 52
      3.4.1 Permian Basin region, NM .................................................................................. 53
      3.4.2 San Juan basin region, NM ................................................................................ 58
   3.5 Ohio ............................................................................................................................... 62
      3.5.1 Utica shale region, OH ....................................................................................... 63
   3.6 Oklahoma ....................................................................................................................... 70
      3.6.1 Anadarko basin, OK ............................................................................................ 71
      3.6.2 Mississippian Lime region, OK .......................................................................... 75
      3.6.3 Woodford shale region, OK ............................................................................... 83
   3.7 Utah ............................................................................................................................... 89
      3.7.1 Uintah basin region, UT ..................................................................................... 90
   3.8 West Virginia ................................................................................................................ 99
      3.8.1 Marcellus shale region, WV .............................................................................. 100

4. Conclusion ........................................................................................................................... 106
5. Appendix A ................................................................................................................. 108
  5.1 Interviews and other information........................................................................... 108
  5.2 Methodology for structured interviews ................................................................. 108
  5.3 Identifying counties with the largest levels of oil and gas activity ....................... 111

6. References .................................................................................................................. 114
Local fiscal effects of oil and gas development in eight states

Daniel Raimi and Richard G. Newell

Abstract

Oil and gas production in the United States has increased dramatically in the past 10 years. This growth has important implications for local governments, which often see new revenues from a variety of sources: property taxes on oil and gas property, sales taxes driven by the oil and gas workforce, allocations of state revenues from severance taxes or state and federal leases, leases on local government land, and contributions from oil and gas companies to support local services. At the same time, local governments tend to experience a range of new costs such as road damage caused by heavy industry truck traffic, increased demand for emergency services and law enforcement, and challenges with workforce retention. This report examines county and municipal fiscal effects in 14 oil- and gas-producing regions of eight states: AK, CA, KS, OH, OK, NM, UT, and WV. We find that for most local governments, oil and gas development—which new or longstanding—has a positive effect on local public finances. However, effects can vary substantially due to a variety of local factors and policy issues. For some local governments, particularly those in rural regions experiencing large increases in development, revenues have not kept pace with rapidly increased costs and demand for services, particularly on road repair.

Key Words: Shale gas, tight oil, local public finance, severance tax, property tax, property values, hydraulic fracturing
1. Report summary

Oil and gas production has grown rapidly in the United States over the past decades, in large part due to the development of shale resources. Local governments are affected by oil and gas development in a variety of ways, including impacts to revenues and demand for services. In this report, we build on our previous research by examining 14 additional regions across eight states with substantial oil and gas production: Alaska, California, Kansas, New Mexico, Ohio, Oklahoma, Utah, and West Virginia. Some of these regions have recently experienced substantial increases in oil and gas activity, while others have not. We describe the major revenue sources, the major demands for services (i.e., costs), and the net fiscal impacts for counties and municipalities in each region. Previous research (Newell & Raimi 2015b, a) examined 12 regions in eight different states: Arkansas, Colorado, Louisiana, Montana, North Dakota, Pennsylvania, Texas, and Wyoming.

We find wide variation in the net fiscal effects for local governments, with most local governments experiencing net fiscal benefits from the industry (See Table 1). However, local factors and state-level policies can play an important role, and some local governments in a variety of states have experienced net costs associated with oil and gas activity. As we found in parts of Kansas, New Mexico, Oklahoma, and Utah, large-scale and rapid oil and gas development in highly rural regions can negatively affect local government finances, which may struggle to keep up with demands for road repair, emergency and law enforcement services, and a variety of costs associated with hiring new and retaining existing staff. If local revenue sources or allocations from the state government are not sufficient to manage these new costs, local governments will experience net fiscal costs and services or infrastructure may deteriorate.

### Table 1 Net financial impact for local governments examined in the study

<table>
<thead>
<tr>
<th>State</th>
<th>Counties</th>
<th>Municipalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska*</td>
<td>Large net positive</td>
<td>Large net positive</td>
</tr>
<tr>
<td>California</td>
<td>Roughly neutral to large net positive</td>
<td>Medium net negative to large net positive</td>
</tr>
<tr>
<td>Kansas</td>
<td>Roughly neutral to large net positive</td>
<td>Small to large net positive</td>
</tr>
<tr>
<td>New Mexico</td>
<td>Roughly neutral to large net positive</td>
<td>Medium net negative to large net positive</td>
</tr>
<tr>
<td>Ohio</td>
<td>Medium to large net positive</td>
<td>Roughly neutral to small net positive</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>Medium net negative to large net positive</td>
<td>Medium to large net positive</td>
</tr>
<tr>
<td>Utah</td>
<td>Medium net negative to large net positive</td>
<td>Medium to large net positive</td>
</tr>
<tr>
<td>West Virginia</td>
<td>Roughly neutral to medium net positive</td>
<td>Medium to large net positive</td>
</tr>
</tbody>
</table>

Note: Impact refers to the relative, not absolute, impact on a local government’s financial position. For example, $1 million may represent a large sum for one local government, but a small sum for another. The terms “small,” “medium,” “large,” and “neutral” are our best assessment, based on interviews with local experts and analysis of local government financial documents. *For Alaska, the “Counties” column refers to Borough governments.*

Local factors such as geography, demographics, and pre-existing infrastructure can each play important roles in determining the net fiscal impacts for local governments in regions with rapidly expanding oil and gas activity. For example, two counties in eastern Utah’s Uintah basin have
experienced substantial fiscal benefits associated with the industry due to large new revenues associated with production. But a neighboring third county has little oil and gas production leading to limited revenues and, because oil and gas vehicle traffic has increased substantially in this county, it has not been able to keep up with demand for road repair.

Throughout Alaska, and in parts of California, Kansas, New Mexico, and Oklahoma, where longstanding oil and gas production has been declining in recent years, a distinct set of issues tends to arise. Generally speaking, local governments in these regions experience substantial fiscal benefits due to a large, though declining, tax base driven by oil and gas property and the oil and gas workforce. For local governments in these regions, a key concern is diversification of public revenues, which is often related to the challenge of diversifying the regional economy. As oil and gas activity slows and the associated tax base erodes, local leaders are trying to increase diversification to support their communities and public coffers. The salience of this challenge will likely grow with the sharp drop in oil prices that began in late 2014 and persists through the time of this writing.

1.1 Local government revenues associated with oil and gas development

Local governments may benefit from a variety of revenue sources associated with oil and gas production including severance taxes, lease revenue from government land, property taxes, and sales taxes, but these sources vary from state to state. In some states, such as Kansas, Oklahoma, and West Virginia, a portion of state-collected severance taxes is allocated directly to local governments. In other states, such as Utah, the state government allocates to local governments a portion of revenues collected from federal oil and gas leases. Lease payments on local government land have also generated substantial revenues for some local governments in California, Kansas, Ohio, and Oklahoma, though these revenues depend on the extent of local government land holdings.

Each state we examine in this report allows local governments to apply their ad-valorem property taxes to the value of oil and gas property, though the applicability of these taxes varies. In some states, both oil and gas production and equipment are taxed as property; in some states, only the surface equipment is included; and in others, only the value of the underground reserves may be taxed as property. Oil and gas activity may also increase sales tax revenues for local governments, either directly through sales of oil and gas equipment, or indirectly through sales generated by the oil and gas workforce.

Finally, oil and gas companies may make in-kind or cash contributions directly to local governments. This can take the form of formal or informal agreements to provide materials or repair roads damaged by oilfield traffic; ad-hoc donations of cash, equipment, or training to local law enforcement, fire departments, and emergency medical services (EMS); and more. We have been unable to establish why these types of contributions are common in some regions and not in others.
Table 2. Major local government revenue sources associated with oil and gas development

<table>
<thead>
<tr>
<th>Revenue instrument</th>
<th>Deployed by</th>
<th>Basis for revenue</th>
<th>Allocated to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severance tax</td>
<td>State</td>
<td>Value or volume of oil/gas production, number of wells drilled</td>
<td>Varies by state</td>
</tr>
<tr>
<td>Lease payments</td>
<td>Federal, state, county, muni</td>
<td>Negotiated lease terms and royalties</td>
<td>State, county, muni</td>
</tr>
<tr>
<td>Property taxes</td>
<td>County, muni</td>
<td>Value of oil/gas property (definitions vary by state)</td>
<td>County, muni</td>
</tr>
<tr>
<td>Sales tax</td>
<td>State, county, muni</td>
<td>Value of sales (rates vary by locality) affected by oil- and gas-related economic activity</td>
<td>State, county, muni</td>
</tr>
<tr>
<td>In-kind</td>
<td>County, muni</td>
<td>Negotiated agreements or donations</td>
<td>County, muni</td>
</tr>
</tbody>
</table>

1.2 Local government costs associated with oil and gas development

Oil and gas development may impose a variety of costs and increased demand for services on local governments. The largest challenge for local governments in most regions we examined was road damage caused by heavy industry truck traffic. This challenge tends to be most acute in regions experiencing large-scale development for the first time, though it also exists in regions with decades of history in oil and gas production. Road damage can be exacerbated by limited local crude oil pipeline infrastructure, which forces most crude to be moved by truck in some regions, as we observed in parts of Kansas, Ohio, Oklahoma, and Utah. Road damage can be mitigated by robust existing infrastructure and in-kind agreements between local governments and operators.

For local governments in highly rural regions experiencing rapid population growth, sewer and water services may be stressed and require costly upgrades. In several western states we visited for our first report (e.g., CO, ND, MT, and WY), sewer and water services were sometimes stressed and required costly upgrades in rural regions that experienced rapid population growth. This was generally not the case in regions examined in this report.

We did observe a variety of new staff costs. First, local governments in many regions have seen increased demand and costs for fire, EMS and law enforcement. These costs arise directly due to vehicle or well sites accidents, increased training and equipment needs to manage emergencies involving hazardous materials, and indirectly in response to increased fights, disorderly conduct, and impaired driving associated with oil- and gas-driven population growth. Second, local governments in a number of regions have needed to add new staff to accommodate increased demand for services from emergency services discussed above, road and bridge crews, administrative staff such as county clerks, and more. Many local governments also face added costs as they must raise their employees’ pay and/or replace workers who are drawn to high wages offered in the oil and gas sector.

Finally, local governments in some regions have experienced substantial costs related to environmental issues. In southern California, one small municipality faced costs from legacy
environmental damage from oil production in the early 20th Century, and another has seen negative fiscal effects associated with developing regulations for potential future oil production. In Kansas and Oklahoma’s Mississippian Lime region, earthquakes associated with oil and gas wastewater injection has caused damage to public property, which directly affects governments, and to private property, which may reduce property values and associated tax revenues.

### Table 3. Major local government costs associated with oil and gas development

<table>
<thead>
<tr>
<th>Service provided</th>
<th>Provided by</th>
<th>Connection to oil/gas industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road maintenance/repair</td>
<td>County, muni</td>
<td>Increased heavy truck traffic</td>
</tr>
<tr>
<td>Sewer/water</td>
<td>Muni</td>
<td>Population growth</td>
</tr>
<tr>
<td>Police, EMS, fire</td>
<td>County, muni</td>
<td>Oil and gas accidents, equipment, training</td>
</tr>
<tr>
<td>Staff costs/workforce ret.</td>
<td>County, muni</td>
<td>Population growth, greater labor demand</td>
</tr>
</tbody>
</table>

### 1.3 Summary of findings in eight states

#### 1.3.1 Alaska

Local governments across Alaska rely heavily on the oil and gas industry, both directly and indirectly. Since the 1970s, production has been dominated by the North Slope region, with more limited (but recently increasing) production from the Cook Inlet region. Many oil and gas industry employees live in southern parts of the state and commute to the North Slope for one- or two-week shifts. These workers and their associated corporate headquarters provide a substantial part of the local sales and property tax base for local governments in the south. In the North Slope, industry activity is largely confined to regions without substantial government services, and oil and gas companies provide their own roads, public safety, and other services. As a result, local governments in the north see few direct costs from the industry but benefit substantially from oil- and gas-related property taxes collected by the North Slope Borough.

Looking forward, Alaska’s state and local governments face substantial fiscal challenges. More than 90 percent of state general fund revenues come from oil- and gas-related sources, and Alaska does not levy a state-wide sales tax or income tax (though many local governments collect sales taxes). Oil prices fell sharply in 2014 and, as production from the North Slope continues to fall, the state expects to face large deficits and will drain its reserve funds within the next several years without new revenue or substantial cuts in spending. This trend may have a sizeable effect on Alaska’s many small local government entities, which rely heavily on revenue sharing and grants from the state.
1.3.2 California

Local governments in California’s oil- and gas-producing regions experience a range of fiscal effects from the industry. In the Los Angeles basin, Los Angeles city and county experience modest effects from oil and gas development due to their large and diverse economies. The city of Long Beach benefits substantially due to its unique position as the working interest in the giant Wilmington oilfield, while the nearby city of Signal Hill experiences substantial negative fiscal effects due to long-term environmental damages associated with oil and gas development in the first half of the 20th century.

In Kern County, where 70 percent of California’s oil is produced, local governments experience large net fiscal benefits despite steadily declining oil and gas production. The county government relies on oil and gas property for a large share of its annual operating revenues. Cities in the region benefit from oil and gas companies and their employees that support the local economy and public finances.

1.3.3 Kansas

We examined local governments in southern Kansas’ Mississippian Lime region and the southwestern Hugoton gas region. In the Mississippian Lime region, municipal governments have generally experienced net fiscal benefits associated with increased sales taxes driven by the oil and gas workforce. However, multiple county governments have not been able to keep up with demand for road repairs. This challenge has been exacerbated by state policies that make revenue from oil- and gas-related sources unpredictable and volatile. Specifically, oil and gas property valuation practices do not accurately reflect the changing price of oil and gas, and allocations from the state’s Oil and Gas Depletion Trust Fund are unpredictable and subject to “sweeps,” where the state government retains revenue that is statutorily allocated to counties. In addition, a number of counties have been subject to lawsuits due to disputes over the proper interpretation of state-issued guidelines for assessing the value of oil and gas property. In several cases, counties have been forced to repay hundreds of thousands of dollars in tax revenues collected in prior years. Finally, local governments in the Mississippian Lime region have experienced damage to public and private property from earthquakes associated with oil and gas wastewater injection.

For local governments in the Hugoton region, where natural gas production has occurred since the 1930s and has been declining for decades, the oil and gas industry provides an important tax base and local governments experience substantial benefits from the industry. For counties, ad valorem property taxes and allocations from the state’s Oil and Gas Depletion Trust Fund, though volatile, have easily outweighed costs associated with the industry. For municipalities, the oil and gas workforce helps support local sales taxes, with little in the way of new costs.
1.3.4 New Mexico

Both regions of New Mexico we examined, the Permian basin in the southeast and the San Juan basin in the northwest, are heavily dependent on the oil and gas industry as an economic driver. For local governments in these regions, local government fiscal health tends to grow stronger during years with high production, and weaken during periods of low production. For county governments, road damage has been the leading cost, but has generally been manageable thanks to revenue from property taxes on oil and gas production and equipment. One county out of the three we examined also receives substantial in-kind donations from industry on road maintenance and repair.

For municipalities, gross receipts taxes (which are similar to sales taxes but include transactions for both goods and services) are the dominant revenue source, and they tend to track oil and gas activity in both regions. Leading costs for municipalities primarily center on workforce retention when oil and gas activity is booming. The leading challenge for municipalities in both regions is diversification of their fiscal bases. Local officials aspire to greater diversification, but the prospects are challenging given high local housing costs, geographic isolation, limited long-distance transportation options, and limited access to amenities.

1.3.5 Ohio

Local governments in Ohio’s Utica shale region have experienced a range of new revenues and costs associated with a rapid increase in shale development. The net effects have generally been positive, with counties benefiting from lease revenues and sales taxes, and municipalities benefiting from in-kind donations and increased municipal income taxes driven by oil and gas activity.

Road-use maintenance agreements (RUMAs) have played a large role in limiting road costs for counties and townships, which maintain much of the state’s rural road networks. However, road costs have still been substantial. In addition, county and municipal governments have seen substantial increases in costs for law enforcement and emergency services associated with the industry, along with workforce retention challenges.

1.3.6 Oklahoma

Oil and gas activity has produced mixed fiscal results for Oklahoma local government finances. Counties in the Mississippian Lime region, where drilling has boomed in recent years, have experienced widespread damage to local roads, and allocations of the state’s severance tax (called the Gross Production Tax, or GPT) have not been sufficient to manage these challenges. Counties collect substantial revenue from ad-valorem taxes on oil and gas property, but those revenues cannot be used for local roads. Instead, roads are funded through several dedicated sources including allocations of the GPT. As a result, most facets of county government in the region have seen large fiscal benefits, while county roads have suffered. Local governments in the region have also
experienced damage to public and private property from earthquakes associated with oil and gas wastewater injection. Counties in other parts of the state have also seen mixed experiences. Those with more robust infrastructure prior to heavy drilling activity have generally seen net fiscal benefits, while those with more limited infrastructure have struggled to repair roads damaged by industry truck traffic.

For municipal governments, oil and gas activity has largely been beneficial across the regions we examined. While population has increased in several cities, the growth has been manageable, and revenue from sales taxes and other sources have generally outpaced new demand for services and costs, such as increased compensation to retain staff. Oklahoma’s substantial local oil and gas workforce is likely an important factor limiting population growth in rural cities.

1.3.7 Utah

Local governments we examined in Utah—with one exception—have experienced net fiscal benefits from increased oil and gas development in the Uintah basin region of Eastern Utah. Property taxes, sales taxes, and allocations of federal leasing dollars from the state government have boosted public finances for county governments. Most crude oil is trucked from the region rather than transported through pipelines, and counties often face challenges with repairing roads affected by this heavy truck traffic. Other major challenges for county governments are related to workforce retention and increased demands on law enforcement from traffic issues and crimes committed by the oil and gas workforce. For two of the three counties we examined, revenues have easily outweighed costs. In Carbon County, where oil and gas vehicle traffic is heavy but where relatively little production occurs, revenues have failed to keep pace with road costs.

Every city in eastern Utah that we examined has experienced substantial fiscal benefits from increased oil and gas development. Key revenue sources are state allocations of federal leasing revenue and sales taxes driven by the oil and gas workforce. Municipalities have also faced increased demand for road repair and emergency services, and have struggled with workforce retention during the most active phases of drilling. In all cases, however, new revenues have easily allowed them to manage these impacts.

1.3.8 West Virginia

Local government finances among the West Virginia local governments we examined have generally benefited from Marcellus shale development. For counties and municipalities, allocations from the state severance tax has been an important source of revenue. Municipalities have benefited from sales taxes due to increased sales volumes associated with Marcellus-driven economic activity. Counties have benefited from increased property tax revenues, boosted by new natural gas properties and their associated infrastructure.
Local governments also described several common challenges, including damage to local roads. In West Virginia, the state government maintains rural road networks, so while road damage does not have a direct impact on county government finances, it does create challenges for local residents and businesses. For municipalities, industry vehicles have damaged city streets and added substantial costs. Heavy vehicle traffic associated with drilling and pipeline construction has also led to a surge in traffic accidents and EMS calls, creating substantial new demands on first responders and raising costs for counties and cities. In addition, a number of local governments in the region struggled to retain their workforce, and were forced to raise wages and other compensation to compete with the oil and gas industry.

1.3.9 Summary of major local government revenues and costs in eight states

<table>
<thead>
<tr>
<th></th>
<th>Severance tax*</th>
<th>Lease revenues*</th>
<th>Property tax</th>
<th>Sales tax</th>
<th>In-kind</th>
<th>Other</th>
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<tr>
<td>AK</td>
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<td>Municipalities</td>
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*Severance taxes and lease revenues from state and federal lands are typically collected by the state government and allocated to local governments according to formulae that vary from state to state.
Table 5. Major local government costs associated with oil and gas development

<table>
<thead>
<tr>
<th></th>
<th>Roads</th>
<th>Sewer and water</th>
<th>Staff/Workforce retention</th>
<th>Police/EMS</th>
<th>Other</th>
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<tbody>
<tr>
<td>AK</td>
<td>Boroughs</td>
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<td>Municipalities</td>
<td>$</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>NM</td>
<td>Counties</td>
<td>$</td>
<td></td>
<td></td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Municipalities</td>
<td>$</td>
<td></td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>OH</td>
<td>Counties</td>
<td>$</td>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Municipalities</td>
<td>$</td>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>OK</td>
<td>Counties</td>
<td>$</td>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Municipalities</td>
<td>$</td>
<td></td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>UT</td>
<td>Counties</td>
<td>$</td>
<td>$</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Municipalities</td>
<td>$</td>
<td>$</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td>WV</td>
<td>Counties</td>
<td>$</td>
<td>$</td>
<td></td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Municipalities</td>
<td>$</td>
<td>$</td>
<td></td>
<td>$</td>
</tr>
</tbody>
</table>

Note: Based on interviews with local government officials and examination of state and local government financial records. A dollar sign indicates that most or all local governments experienced the relevant category as a major new cost attributable primarily to oil and gas development.

1.4 Summary of key findings

The fiscal effects of oil and gas production on local governments can vary according to a number of local factors. For most regions we examined, oil and gas development—whether new or longstanding—has been a net positive for county and municipal finances. For highly rural communities with limited existing infrastructure, rapid and large scale industry growth tends to result in large new costs such as road repair, emergency services, and staff costs. For regions that are highly reliant on oil and gas as an economic base, decreasing production and associated revenues poses important questions about long-term fiscal health. Other key findings include:

Predictable, reliable revenue sources are beneficial for local governments with revenues that are closely tied to the oil and gas industry. While industry activity inevitably ebbs and flows with changes in regional gas and global oil prices, policies can either mitigate or exacerbate this volatility.

Flexible funding mechanisms, such as Utah’s Community Impact Grants, can complement these more predictable revenues by supporting local governments experiencing unexpectedly high costs associated with oil and gas development.

Collaboration with oil and gas operators particularly on road repair, can substantially reduce the costs for local governments trying to maintain infrastructure affected by industry traffic.
Regions with long-term declining production face a distinct set of issues. Economic diversification is a goal for officials in these regions, but will be a challenge given the geographic isolation, limited amenities, and limited infrastructure available in many of these communities.

Oil- and gas-related environmental issues can affect local public finances. Legacy environmental issues in parts of southern California and damage from earthquakes associated with oil and gas wastewater injection in the Mississippian Lime region have created fiscal challenges.

Alaska faces distinct challenges. Many small local governments depend heavily on funding from the state, which faces revenue shortfalls for the foreseeable future. Larger local governments may also struggle if oil production and associated employment declines.

1.5 Summary of methodology

This report describes the recent fiscal impacts to local governments related to oil and gas development. The regions included in this report were selected to complement the states and regions examined in previous research (Newell & Raimi 2015b). In that report, we examined local governments where oil and gas activity had most rapidly increased in the preceding decade: Arkansas (Fayetteville), Colorado (Niobrara and Piceance basin), Louisiana (Haynesville), Montana (Bakken), North Dakota (Bakken/Three Forks), Pennsylvania (Marcellus), Texas (Barnett, Eagle Ford, Haynesville, and Permian basin), and Wyoming (Green River basin).

In this report, we examine every other major onshore oil- and gas-producing region of the United States. Therefore, we include regions where development has increased substantially in recent years, as well as regions where industry activity has changed little or declined. We include local governments in and around major producing regions in Alaska (Kenai Peninsula and North Slope), California (Kern County and Los Angeles basin), Kansas (Hugoton and Mississippian Lime), New Mexico (Permian and San Juan basins), Ohio (Utica), Oklahoma (Anadarko basin, Mississippian Lime and Woodford), Utah (Uintah basin), and West Virginia (Marcellus). Table 6 provides basic information on each region and its oil and gas development status.
Table 6: Major oil- and gas-producing regions examined

<table>
<thead>
<tr>
<th>State</th>
<th>Play/region</th>
<th>Initial major production</th>
<th>Predominate type</th>
<th>Production status</th>
</tr>
</thead>
<tbody>
<tr>
<td>AK</td>
<td>Kenai Peninsula</td>
<td>1960s</td>
<td>Oil/gas</td>
<td>Declining since 1960s, limited new activity</td>
</tr>
<tr>
<td></td>
<td>North Slope</td>
<td>1970s</td>
<td>Oil</td>
<td>Declining since 1980s, limited new activity</td>
</tr>
<tr>
<td>CA</td>
<td>Los Angeles</td>
<td>1890s</td>
<td>Oil</td>
<td>Declining since 1970s, limited new activity</td>
</tr>
<tr>
<td></td>
<td>Kern County</td>
<td>1920s</td>
<td>Oil</td>
<td>Slight decline since 1980s, strong new activity</td>
</tr>
<tr>
<td>KS</td>
<td>Hugoton</td>
<td>1930s</td>
<td>Gas</td>
<td>Declining since 1970s, limited new activity</td>
</tr>
<tr>
<td></td>
<td>Mississippian Lime</td>
<td>2010s</td>
<td>Oil/gas</td>
<td>Very active in early 2010s</td>
</tr>
<tr>
<td>NM</td>
<td>Permian basin</td>
<td>1930s</td>
<td>Oil/gas</td>
<td>Very active in early 2010s</td>
</tr>
<tr>
<td></td>
<td>San Juan basin</td>
<td>1980s</td>
<td>Gas</td>
<td>Very active in 2000s, declining in 2010s</td>
</tr>
<tr>
<td>OH</td>
<td>Utica</td>
<td>2010s</td>
<td>NGLs/gas</td>
<td>Very active in 2010s</td>
</tr>
<tr>
<td>OK</td>
<td>Anadarko basin</td>
<td>1970s</td>
<td>Oil/gas</td>
<td>Very active in 2010s</td>
</tr>
<tr>
<td></td>
<td>Mississippian Lime</td>
<td>1950s</td>
<td>Oil/gas</td>
<td>Declining since 1970s, very active in 2010s</td>
</tr>
<tr>
<td></td>
<td>Woodford</td>
<td>2000s</td>
<td>Gas</td>
<td>Very active in 2000s, declining in 2010s</td>
</tr>
<tr>
<td>UT</td>
<td>Uintah basin</td>
<td>1950s</td>
<td>Oil/gas</td>
<td>Very active in 2000s, declining in 2010s</td>
</tr>
<tr>
<td>WV</td>
<td>Marcellus</td>
<td>2000s</td>
<td>Gas</td>
<td>Very active in 2010s</td>
</tr>
</tbody>
</table>

While not a comprehensive survey of local governments in these regions, our methodology allows us to make fairly broad conclusions about overall fiscal effects of oil and gas activity. The local governments we examine vary across four important dimensions: scale of oil and gas development (i.e., how much oil and gas activity has occurred or is occurring), phase of oil and gas development (i.e., is the region currently experiencing large amounts of activity and population growth, or has activity slowed), size of government (e.g., a small town or a large city), and rurality of region (e.g., population density and existing infrastructure). Metrics illustrating these factors are provided throughout the report and are aggregated in Appendix tables A2 and A3. Examining local governments that varied across these dimensions allowed us to observe whether any or all of these variables weighed heavily on the net fiscal effects.

This analysis examines recent fiscal effects, rather than historical or potential future fiscal effects. However, if major challenges or opportunities concerning historical or long-term trends arose during our interviews (for example, how to make fiscal plans under uncertain oil and gas production and price scenarios), we make note of them in this report.

Our analysis is based on three major research components and is similar to the analysis conducted in Newell and Raimi (2015b). First, we traveled to each region to conduct structured interviews with leading elected officials (i.e., county commissioners or mayors), professional staff (i.e., city managers or county administrators), and subject area experts (i.e., finance directors or oil and gas department administrators). Second, we conducted a detailed analysis of local and state government financial documents along with data on oil and gas activity to understand whether recent fiscal trends were correlated with industry activity. Third, we analyzed revenue collection and allocation policies, which vary substantially between states.
2. Introduction and background

2.1 Methodology

This report describes recent fiscal impacts to local governments related to oil and gas development. The regions included in this report were selected to complement the states and regions examined in our previous research (Newell & Raimi 2015b). In that report, we examined local governments where oil and gas activity had most rapidly increased in the preceding decade: Arkansas (Fayetteville), Colorado (Niobrara and Piceance basin), Louisiana (Haynesville), Montana (Bakken), North Dakota (Bakken/Three Forks), Pennsylvania (Marcellus), Texas (Barnett, Eagle Ford, Haynesville, and Permian basin), and Wyoming (Green River basin).

The purpose of this report is to examine the remaining major oil- and gas-producing onshore regions in the United States to determine whether local government fiscal effects were similar or different, and to understand what lessons could be learned. Therefore, this report includes analysis of regions where oil and gas development has increased significantly in recent years, as well as regions where industry activity has changed little or declined. We include local governments in and around major producing regions in Alaska (Kenai Peninsula and North Slope), California (Kern County and Los Angeles basin), Kansas (Hugoton and Mississippian Lime), New Mexico (Permian and San Juan basins), Ohio (Utica), Oklahoma (Anadarko basin, Mississippian Lime and Woodford), Utah (Uintah basin), and West Virginia (Marcellus). Table 7 describes the relevant regions and their status in terms of oil and gas development.

<table>
<thead>
<tr>
<th>State</th>
<th>Play/region</th>
<th>Initial major production</th>
<th>Predominate type</th>
<th>Play status</th>
</tr>
</thead>
<tbody>
<tr>
<td>AK</td>
<td>Kenai Peninsula</td>
<td>1960s</td>
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</tr>
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<tr>
<td></td>
<td>Kern County</td>
<td>1920s</td>
<td>Oil/gas</td>
<td>Very active in early 2010s</td>
</tr>
<tr>
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<td>Hugoton</td>
<td>1930s</td>
<td>Gas</td>
<td>Declining since 1970s, limited new activity</td>
</tr>
<tr>
<td></td>
<td>Mississippian Lime</td>
<td>2010s</td>
<td>Oil/gas</td>
<td>Very active in early 2010s</td>
</tr>
<tr>
<td>NM</td>
<td>Permian basin</td>
<td>1930s</td>
<td>Oil/gas</td>
<td>Very active in early 2010s</td>
</tr>
<tr>
<td></td>
<td>San Juan basin</td>
<td>1980s</td>
<td>Gas</td>
<td>Very active in 1990s, declining in 2000s</td>
</tr>
<tr>
<td>OH</td>
<td>Utica</td>
<td>2010s</td>
<td>NGLs/gas</td>
<td>Very active in 2010s</td>
</tr>
<tr>
<td>OK</td>
<td>Anadarko basin</td>
<td>1970s</td>
<td>Oil/gas</td>
<td>Very active in 2010s</td>
</tr>
<tr>
<td></td>
<td>Mississippian Lime</td>
<td>1950s</td>
<td>Oil/gas</td>
<td>Declining since 1970s, very active in 2010s</td>
</tr>
<tr>
<td></td>
<td>Woodford</td>
<td>2000s</td>
<td>Gas</td>
<td>Very active in 2000s, declining in 2010s</td>
</tr>
<tr>
<td>UT</td>
<td>Uintah basin</td>
<td>1950s</td>
<td>Oil/gas</td>
<td>Very active in 2000s, declining in 2010s</td>
</tr>
<tr>
<td>WV</td>
<td>Marcellus</td>
<td>2000s</td>
<td>Gas</td>
<td>Very active in 2010s</td>
</tr>
</tbody>
</table>

This analysis examines recent fiscal effects, rather than historical or potential future fiscal effects. However, if major challenges or opportunities concerning historical or long-term trends
arose during our interviews (for example, how to make fiscal plans under uncertain oil and gas production and price scenarios), we make note of them. In addition, this report does not directly examine the private sector economic impacts or potential environmental risks associated with oil and gas development. They do enter our realm of analysis if they affect local government finances.

While not a comprehensive survey, our methodology allows us to make fairly broad conclusions by examining local governments that vary across several key dimensions (King et al. 1994), notably: scale and phase of oil and gas development, government capacity, and rurality of region (Jacquet & Kay 2014). Scale and phase matter because local government revenues and demand for services tend to vary along both dimensions. Increased population, heavy truck traffic, and other effects can increase local government costs as well as revenues during a phase of heavy drilling and hydraulic fracturing. We examine local governments from regions where oil and gas activity and production peaked in previous decades and has since been declining, such as Kansas’ Hugoton gas field region, the Los Angeles basin, and Alaska’s North Slope; regions that experienced a rapid expansion in industry activity five to 10 years ago, such as Utah’s Uintah basin, Oklahoma’s Woodford shale, and New Mexico’s San Juan basin; and regions where oil and gas activity has been robust in recent years, such as the Mississippian Lime play in Oklahoma and Kansas, Ohio’s Utica shale, New Mexico’s Permian basin, and West Virginia’s Marcellus shale.

Government capacity and rurality of region also play an important role in managing impacts. For example, an oil and gas boom leading to an influx of hundreds or thousands of workers will be felt very strongly in a rural region with limited housing stock, unpaved roads, and limited government services (N.C. Department of Environment and Natural Resources 2012). That same growth may also be felt, though to a lesser extent, in a more densely populated region with ample housing stock, sturdy roads, and substantial existing government infrastructure. Our interviews took us to regions that varied from densely populated cities like Los Angeles to some of the most sparsely populated parts of the United States in Alaska (for population density details, see Appendix A).

The scale of oil and gas development in a region can be measured in a variety of ways. Two helpful metrics that we consider indicate the number of oil and gas well completions per year in a given county divided by (1) the county population or (2) the square miles of land area within that county. Well completions may be a more accurate measure of activity than number of wells drilled or rig count, since the heaviest volume of truck traffic for hydraulically fractured wells tends to be associated with completion activities. We refer to these metrics as “completions per hundred persons” and “completions per hundred square miles,” respectively, and report those metrics for each county we visited in Appendix A.

Our analysis is based on three major research components, similar to the analysis conducted in Newell and Raimi (2014b). First, we traveled to each jurisdiction discussed in this report for
structured interviews with leading elected officials (i.e., county commissioners, mayors), professional staff (i.e., city managers, county administrators), and subject area experts (i.e., finance directors, oil and gas administrators). In total, we interviewed 93 local government officials from 29 counties and 38 municipalities (see the Appendix for a reproduction of our structured interview template). We also interviewed local experts from oil and gas companies, state government agencies, and consultants with expertise on oil and gas fiscal issues.

In our interviews with local officials, we asked whether the jurisdiction had experienced a range of potential revenue sources and service demands or costs associated with oil and gas development. We asked about the timing of these effects and whether they could be attributed, either directly or indirectly, to oil and gas activity in the region.

We also asked local officials to describe the magnitude of these effects, and to quantify those effects wherever possible through fiscal data such as property valuations or tax receipts. In many cases, precise quantification can be difficult. For example, attributing the share of sales tax revenue associated with oil- and gas-driven population growth, or estimating the consumptive use damages to roadways from oil- and gas-related vehicle traffic, can be difficult. When this was the case, we asked local officials to describe the effect as “small, medium, large, or something different.” In cases with substantial costs such as road damage, we asked whether revenues had or had not been sufficient to manage new demands.

The second component of our analysis is a detailed examination of local and state government financial documents, to verify and supplement information gleaned from interviews. For local government records, we acquired wherever possible Comprehensive Annual Financial Reports (CAFRs), annual audited reports produced by local governments documenting key fiscal issues for each fiscal year. We attempted to collect CAFRs from 2005 through the most recent available year, usually 2012 or 2013. In total, we collected and analyzed over 500 years of CAFR data as summarized in Table 8.

<table>
<thead>
<tr>
<th>State</th>
<th>Counties examined</th>
<th>Municipalities examined</th>
<th>Number of local experts interviewed</th>
<th>Years of CAFR data analyzed</th>
</tr>
</thead>
<tbody>
<tr>
<td>AK*</td>
<td>2</td>
<td>5</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>CA</td>
<td>2</td>
<td>8</td>
<td>16</td>
<td>92</td>
</tr>
<tr>
<td>KS</td>
<td>7</td>
<td>4</td>
<td>14</td>
<td>34</td>
</tr>
<tr>
<td>NM</td>
<td>3</td>
<td>5</td>
<td>9</td>
<td>60</td>
</tr>
<tr>
<td>OH</td>
<td>3</td>
<td>3</td>
<td>12</td>
<td>58</td>
</tr>
<tr>
<td>OK**</td>
<td>7</td>
<td>7</td>
<td>16</td>
<td>85</td>
</tr>
<tr>
<td>UT</td>
<td>3</td>
<td>3</td>
<td>10</td>
<td>58</td>
</tr>
<tr>
<td>WV</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>78</td>
</tr>
</tbody>
</table>

*Alaska “counties” category refers to Borough governments. **CAFR data in Oklahoma were not available. Unaudited financial reports were examined instead.
Where these reports were not available (typically for very small municipalities), we gathered recent budgetary data and other information directly from local officials. For state fiscal records, we rely on a variety of reports and statistical publications related to oil and gas production, tax revenues and allocations, state and federal oil and gas leasing and royalty records, local road and bridge conditions, and more.

Third, we conducted a detailed analysis of state revenue collection and allocation policies. States vary in their collection of oil- and gas-related revenue and allocation to local governments. For example, some states allow local governments to apply ad valorem property taxes to oil and gas property such as rigs, wellheads, and pipelines, while others allow local governments to apply those taxes to the minerals underground or the value of oil and gas produced. Some states allow for both of these levies, while others allow neither. States collecting severance taxes and leasing revenues from state or federal lands also allocate those revenues according to a variety of formulae, which may or may not include local governments. We examined each of these revenue collection and allocation policies for each state, gathering information from local experts and relevant state statutes. In most cases, we focus on current revenue policies, only turning to historical issues when these issues are relevant for near-term local government fiscal impacts.

Details on revenue collection and allocation to local governments from oil- and gas-related sources are an important component in understanding the fiscal impacts to local governments from oil and gas development. We focus on these issues in a companion report, describing in detail how local governments collect revenue from oil- and gas-related sources, and how state governments collect and allocate revenues to the local level (Raimi & Newell 2016).
3. Revenues, costs, and net fiscal impacts

From December 2014 through June 2015, we visited 14 oil and gas plays across eight states to conduct interviews with local government officials and gather local government financial data (see Figure 1). We used these data along with detailed analysis of state tax policies to assess the net fiscal impact to local governments in each region. In the section below, we discuss the major revenue sources, costs and demand for services, and net fiscal impacts for county and municipal governments associated with oil and gas activity. Where appropriate, we identify and discuss policies and industry trends that have substantially affected the fiscal outcomes in these regions.

![Figure 1. Regions/plays visited](image)

**Figure 1. Regions/plays visited**

Map source: Drilling Info 2.0, with annotations by the authors. Notes: Heat map indicates permits issued for oil and gas drilling in 90 days prior to 02/20/2015. Heat map not available for Alaska.

3.1 Alaska

Local governments across Alaska rely heavily on the oil and gas industry for revenue, both directly and indirectly. Since the 1970s, production has been dominated by the North Slope region, with more limited (but recently increasing) production from the Cook Inlet, which is bounded to the East by the Kenai (pronounced KEEN-eye) Peninsula. Many oil and gas industry employees live in southern parts of the state such as Anchorage, Wasilla, and the Kenai Peninsula, but commute regularly to the North Slope for one- or two-week shifts. These workers provide a substantial part of the local sales and property tax base for local governments in the south, and industry activity has little direct impact on government costs. In the North Slope, industry activity is largely confined to remote regions without substantial government services, and oil and gas companies provide their own roads, public safety, and other services. As a result, local governments in the region see little direct impact from the industry but benefit substantially from oil- and gas-related property taxes.
collected by the North Slope Borough (in Alaska, local governments can apply ad-valorem property taxes to oil and gas exploration, production, and transportation property such as drilling rigs, processing facilities, and pipelines, but not to produced oil and gas or the value of underground minerals).

Looking forward, Alaska’s state and local governments face substantial fiscal challenges. More than 90 percent of state general fund revenues come from oil- and gas-related sources, and Alaska does not levy a state-wide sales tax or income tax (though many local governments collect sales taxes). Oil prices fell sharply in 2014 and, as production from the North Slope continues to fall, the state expects to face large deficits and will drain its reserve funds within the next several years without new revenue or dramatic cuts in spending. This trend may have a substantial effect on Alaska’s many small local government entities, which rely heavily on revenue sharing and grants from the state.

### Table 9. Alaska Borough Summary

<table>
<thead>
<tr>
<th>Major revenue source(s)</th>
<th>Property tax</th>
<th>Sales tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major cost(s)</td>
<td>Workforce retention</td>
<td></td>
</tr>
<tr>
<td>Net fiscal impact</td>
<td>Large net positive</td>
<td></td>
</tr>
</tbody>
</table>

Note: Borough governments are similar to counties in other states, but also oversee local schools. In the North Slope, the Borough government provides most other services including roads, water and sewer, and more.

### Table 10. Alaska Municipality Summary

<table>
<thead>
<tr>
<th>Major revenue source(s)</th>
<th>Sales tax</th>
<th>Severance tax</th>
<th>Property tax</th>
<th>Lease revenues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major cost(s)</td>
<td>Workforce retention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net fiscal impact</td>
<td>Large net positive</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 3.1.1 Anchorage and Kenai Peninsula region, AK

The Kenai Peninsula Borough (pop. ~57,000) is a sparsely populated region southeast of Anchorage along the Cook Inlet, where the first major oil and gas production occurred in Alaska. Through the 1950s and 1960s the Cook Inlet produced all of Alaska’s oil and gas, largely from shallow offshore wells. Oil and gas production had been falling steadily since that time until recent years, when new drilling activity brought along new production (see Figure 2). The state government has incentivized new production in Cook Inlet since the 1980s with lower effective tax rates. Today, production tax rates are $0 for oil and $0.177 per thousand cubic feet of natural gas, well below the
statutory rate of 35 percent (Alaska Statutes 2015). This new production has been helpful to the local economy, but is modest relative to the much larger quantities produced in the North Slope.

**Figure 2: Kenai Peninsula oil and gas production**

For the Peninsula as well as Anchorage, the state’s largest city, larger economic and fiscal impacts are attributable to oil industry workers who commute to the North Slope, work at regional offices in Anchorage, or staff the many oil and gas service firms located within the city. In the Kenai Peninsula, a smaller but noticeable impact has come from the Nikiski liquefied natural gas (LNG) export terminal, where natural gas produced from the Cook Inlet has been exported to Asia since 1969. A 2013 report from Alaska’s Department of Labor estimates that of all the earnings brought home by oil and gas industry employees statewide, 50 percent went to residents of Anchorage and 23 percent went to residents of the Kenai Peninsula, the two highest totals in the state. These earnings are especially helpful for local economies in the region because average oil and gas industry earnings (roughly $127,000/year) are more than twice those of the statewide average for all sectors (roughly $50,000/year) (Alaska Department of Labor and Workforce Development 2013).

These indirect effects of oil and gas industry employment are the largest factor affecting local public finances in Anchorage and the Kenai Peninsula. Direct costs from oil and gas activity in recent years has been small. However, a proposed expansion of LNG exports from the Peninsula has the potential to change this equation. The project would involve the construction of a new pipeline to transport natural gas from the North Slope to Nikiski and export roughly 2.5 billion
cubic feet per day (bcf/d), costing an estimated $65 billion.\textsuperscript{1} If this project moves forward, it would result in an influx of temporary workers and industrial activity, and would likely result in large increases in demand for services as well as revenues for local governments on the Peninsula. A collection of local government officials in the region are currently working with industry representatives to develop plans to mitigate the potential negative impacts of this activity.\textsuperscript{2}

3.1.1.1 Borough-level experience in the Kenai Peninsula region, AK

3.1.1.1.1 Kenai Peninsula Borough, AK

As noted above, the Kenai Peninsula Borough benefits from an oil and gas industry workforce commuting to the North Slope for regular shifts. This workforce primarily contributes to public finances through a borough-wide 3 percent sales tax and property taxes, which together accounted for $85 million, or 70 percent of total borough revenues in FY 2014 (Kenai Peninsula Borough Finance Department 2005-2014). While it is unclear what precise share of these revenues are attributable to the oil and gas workforce and their families, local officials estimate the effect is substantial.\textsuperscript{3}

There are also sales taxes generated directly by purchases of oil and gas equipment made by oil and gas companies. However, these revenues are relatively small, because sales taxes in the borough only apply to the first $500 of each taxable transaction. For example, the purchase of a $10,000 piece of equipment would generate $15 (0.03 x $500) in tax revenue rather than the $300 (0.03 x $10,000) it would generate without the cap.

Another relevant boost to local public finances is related to Alaska’s Permanent Fund Dividend, which sends a check to every Alaskan each year based on returns from the state’s $54 billion permanent fund. In 2014, that check was worth $1,884 (U.S. Energy Information Administration 2015c). Each October, when residents receive these dividends, sales increase noticeably, leading to additional revenues for the borough and other local governments deploying a sales tax. As with large oil and gas industry purchases, the $500 cap on taxable sales value reduces the total revenue local governments would otherwise receive.

A more quantifiable, and perhaps more substantial revenue source related to oil and gas development comes from property taxes on oil and gas infrastructure such as pipelines, offshore

\textsuperscript{1} Based on interview with Phil Cochrane, Vice President of External Affairs, BP; and Paul A. Quesnel, Senior Director of Government Affairs, BP; on June 2, 2015, in Anchorage, AK.

\textsuperscript{2} Based on interview with Larry Persily, Special Assistant to the Mayor of Kenai Peninsula, on June 1, 2015, in Anchorage, AK.

\textsuperscript{3} Based on interview with Larry Persily, Special Assistant to the Mayor of Kenai Peninsula; and Brenda Ahlberg, Community and Fiscal Projects Manager, Kenai Peninsula Borough; June 3, 2015, in Soldotna, AK.
platforms, processing facilities, and the existing LNG export terminal in Nikiski. In FY 2015, oil and gas property accounted for $1.225 billion, roughly 17 percent of the borough’s $7.27 billion in overall property valuation; more than doubling since FY 2007, when it accounted for $558 million (11 percent of total valuation) (Kenai Peninsula Borough Finance Department 2015).

The borough also receives roughly $500,000 annually from the state government as part of a program that allocates state general funds to local governments according to a formula based primarily on population. These revenues are not directly tied to oil and gas activity in the region, but since roughly 90 percent of the state’s general fund revenue comes from oil- and gas-related sources (Alaska Department of Revenue 2014), the revenue is largely a product of oil and gas activity.

In the next few years, local officials expect these allocations to be phased out. While not a major part of Kenai Peninsula Borough’s budget, many local governments in Alaska—particularly small cities—rely heavily on these types of state allocations and grant programs (see our discussion of Barrow and the North Slope Borough in Section 3.1.2).

Direct costs and demand for services from oil and gas activity have been minimal in recent years for the borough. Because little drilling activity takes place on the peninsula itself, there is little in the way of large costs associated with industry vehicle traffic. Recent increases in drilling and production have resulted in some increased vehicle traffic and growth in temporary populations, but the effects have been negligible.

Looking forward, public finances across the Kenai Peninsula will be heavily affected if the new LNG export terminal moves forward. This project is estimated to create 10,000 to 15,000 direct jobs across the state; a significant figure given total private employment in Alaska of roughly 260,000 (U.S. Bureau of Labor Statistics 2015). Such a project would certainly bring substantial new revenues as well as new demand for services for local governments. Kenai Peninsula Borough officials are working with other local government officials, state officials, and industry representatives to craft plans to mitigate any negative local impacts such as a rapid temporary increase in workforce, increased heavy vehicle traffic, and other potential issues.

3.1.2 Municipal-level experience in Anchorage and Kenai Peninsula region, AK

While the cities of Anchorage and Wasilla are not part of the Kenai Peninsula, we interviewed officials in both municipalities to understand whether the oil and gas industry plays a major role in public finances. Kenai and Soldotna, roughly a three-hour drive south of Anchorage, are coastal cities along the Cook Inlet.
3.1.1.2.1 Anchorage, AK

Anchorage is Alaska’s largest city, with a population of roughly 300,000. As noted above, a large share of the oil and gas workforce resides in Anchorage. This workforce involves not only workers commuting to the North Slope, but also professional staff working at corporate headquarters. The three major oil companies operating in the North Slope – BP, ConocoPhillips, and ExxonMobil – all have substantial office space and staff based in Anchorage. Oilfield service companies such as Baker Hughes and pipeline companies such as Alyeska (which built, maintains, and operates the Trans-Alaska Pipeline System, or TAPS) also have a substantial presence in Anchorage.

However, Anchorage does not have a sales tax, which means that spending by these workers does not generate revenue for the city. Instead, Anchorage raises revenue primarily through property taxes, which generated $334 million in FY 2014 (48 percent of total revenues) and charges for services such as water and electricity, which generated $261 million (38 percent) in FY 2014 (Municipality of Anchorage Controller’s Office 2014). The oil and gas workforce and associated commercial office space contributes substantially to these revenues, but the precise share of their contributions are not clear.

Like the Kenai Peninsula Borough, Anchorage also benefits from population-based allocations and grants from the state government, through these revenues have been falling in recent years and are likely to decline toward zero.4

Another fiscal benefit for the city results from its partial ownership of the Beluga gas field, which lies across from the Kenai Peninsula along the western shore of Cook Inlet. The city owns 33 percent of this field, and uses the natural gas it produces to fuel Anchorage Municipal Light and Power, which provides electricity to consumers in and around the city.

As with other Alaska cities, Anchorage faces little direct service demands associated with oil and gas activity. Aside from the need to provide standard services to the oil and gas workforce living within the city, the only major cost is related to workforce retention. Because the city government provides sewer, water, and power services, it often competes with the oil and gas sector for skilled plumbers, welders, electricians, and other relevant trades. This competition has caused it to raise wages and other compensation, and represents a constant challenge for the city government.

Looking forward, Anchorage may face challenges related to infrastructure maintenance. If oil production from the North Slope continues to fall, as most projections show (U.S. Energy Information Administration 2015a), Anchorage faces the possibility of losing some of its economic

4 Based on interview with George Vakalis, Anchorage Municipal Manager, June 1, 2015, in Anchorage, AK.
base from oil and gas companies. Under such a scenario (which local officials raised as a distinct concern), revenues would drop but costs for maintaining infrastructure would remain relatively fixed. As a result, the city has looked in recent years at different strategies to diversify its revenue sources, such as adding a sales tax. While a variety of proposals have been introduced, none have been approved, and the political challenges of implementing a broad-based tax such as a sales tax are substantial.

3.1.1.2.2 **Wasilla, AK**

Wasilla (pop. ~8,600), roughly an hour’s drive north of Anchorage, is part of the Matanuska-Susitna Borough. Similar to other cities in the region, city government sees little in the way of direct impact from oil and gas activities, but a substantial share of its population commutes to work on the North Slope. Residents of the Matanuska-Susitna Borough collected an estimated 20 percent of total oil and gas industry earnings in 2011, with Wasilla residents taking home an estimated $142 million, second only to Anchorage (Alaska Department of Labor and Workforce Development 2013).

This workforce contributes to the city’s sales tax base, the largest revenue source for Wasilla at roughly 50 percent of total revenues (charges for water, sewer, and other services are second) (Wasilla Department of Finance 2008-2014). Sales taxes tend to increase in October of each year when residents receive their Permanent Fund Dividend checks. Like other cities, Wasilla also receives annual allocations from the state government based primarily on population (it received roughly $400,000 in 2014), though these funds are expected to dry up within the next several years.

Direct costs from oil and gas activity are negligible, while the indirect costs of providing services for residents employed in the oil and gas industry are substantial. “Indirectly, everything is energy-related,” according to Mayor Bert Cottle, but costs are easily manageable and have not fluctuated dramatically as oil prices rise and fall.

Looking forward, declining North Slope oil production could reduce the city’s oil and gas workforce, potentially reducing its population and long-term economic viability. The city has been careful not to add new debt in recent years, and has been making plans to potentially reduce city services such as recreation if industry activity continues to decline.

3.1.1.2.3 **Kenai, AK**

The city of Kenai (pop. ~7,500) is roughly 15 miles south along the Cook Inlet from Nikiski, home of the existing LNG export terminal and potential future site of the larger LNG project that would export North Slope gas to Asian markets. Like other cities on the Peninsula, Kenai’s

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5 Based on interview with Bert Cottle, Wasilla mayor, June 2, 2015, in Wasilla, AK.
Local fiscal effects of oil and gas development in eight states

Raimi and Newell

Economy and public finances are tied to the oil and gas workforce. Some residents commute regularly to the North Slope, and others work at nearby facilities such as the LNG export terminal or at nearby oil and gas service firms such as Schlumberger, Baker Hughes, and smaller oil and gas contractors. These firms service the LNG terminal as well as offshore oil and gas platforms.

The Alaska Department of Labor estimated that in 2011 there were 894 oil and gas industry workers living in Kenai, collecting roughly $82 million in wages (Alaska Department of Labor and Workforce Development 2013). The city’s sales and property taxes, which accounted for 37 percent of total revenues in 2014, are supported by these workers and their families, as well as oil and gas facilities and equipment which provide substantial property tax revenue (Kenai Finance Department 2005-2014). Kenai also owns a parcel of land with producing natural gas wells, which brings in between $60,000 and $150,000 per year depending on prices and production levels.6

Kenai relies fairly heavily on grants, which accounted for roughly 28 percent of total revenues in FY 2014. As a result, the city may face some financial risk if and when the state government begins to reduce spending due to declining oil and gas revenues.

Direct costs from oil and gas operations are limited, and indirect costs associated with oil and gas employees is easily manageable. However, two concerns loom on the horizon. The first relates to public pensions. During the construction of TAPS, state and local governments across Alaska struggled to attract and retain employees due to high labor demand associated with pipeline construction. In response, the state increased the generosity of the Public Employees Retirement System, which obligated increased contributions from local governments. Contributions to this program have been a strain for Kenai and other local governments around the state. Although Kenai officials believe the challenge is manageable, it continues to be a concern.

The second potential issue also relates to the public labor force. If the new LNG project in Nikiski moves forward, the city manager estimates that the city government will lose 60 percent of its workforce. It would need to raise wages and other compensation to attract and retain workers and, while increased economic activity would likely boost sales taxes and other revenues, the long-term implications of additional pension obligations could pose a challenge.

3.1.1.2.4 Soldotna, AK

Soldotna (pop. ~4,400) lies roughly 10 miles inland from the city of Kenai and is small—just seven square miles. The fiscal effects of the oil and gas industry are similar to those described above for Kenai: substantial indirect revenues and service demands associated with the oil and gas workforce. According to state estimates, 991 oil and gas workers living in Soldotna earned roughly

6 Based on interview with Rich Koch, Kenai city manager, June 3, 2015, in Kenai, AK.
$92 million in 2011 (Alaska Department of Labor and Workforce Development 2013). Sales taxes are the city’s leading revenue source ($7.7 million in FY 2014), followed by grants ($6.7 million in FY 2014), which raises concern about the potential for declining state grant funds in future years.

As with other cities in the region, Soldotna is currently planning for challenges that may arise due to construction of the new LNG facility in nearby Nikiski. It is working with other local governments and industry representatives to prepare for the potential influx of temporary workers and increased industrial activity.7

### 3.1.2 North Slope region, AK

Alaska’s North Slope (pop. ~9,700) is one of the most sparsely populated regions of the United States, with roughly 0.11 inhabitants per square mile. It includes the entirety of Alaska’s Arctic Ocean coastline and spans over 88,000 square miles, larger than the states of Utah or Idaho. Most cities are along the coast of the Beaufort or Chukchi Seas, as is Prudhoe Bay, the source of most of the state’s oil.

Production from Prudhoe Bay began in the 1970s and quickly grew to more than 1.5 million barrels per day (mb/d). Other oil fields in the North Slope were discovered in subsequent years, and total oil production from the North Slope peaked at just over 2 mb/d in 1988. Since that time, Prudhoe Bay production has fallen substantially, and every other large North Slope oil field is in decline. In 2014, total Alaska crude oil production fell below 500,000 b/d for the first time since 1977 (U.S. Energy Information Administration 2015b).

Looking forward, oil and gas production from the North Slope is highly uncertain. Under a high price scenario, production from the region could grow to 650,000 b/d by 2028 from new fields such as Thomson Point or offshore areas in the Chukchi or Beaufort Seas, along with increased investment to slow production declines in older fields (U.S. Energy Information Administration 2015a). Under low-price scenarios, production continues to decline and falls to zero, as TAPS requires a minimum level of oil to remain in operation (estimates vary in the range of 300,000 b/d). Under EIA’s reference case projection, production declines through 2035 but then increases due to increased offshore production in the Beaufort and Chukchi Seas (see Figure 3).

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7 Based on interview with Stephanie Queen, Soldotna director of economic development and planning, June 3, 2015 in Soldotna, Alaska.
3.1.2.1 Borough-level experience in North Slope region, AK

3.1.2.1.1 North Slope Borough, AK

The North Slope Borough was incorporated in 1972, several years after giant oil deposits were discovered in and around Prudhoe Bay. The borough provides nearly all local government services, including education, health services, roads, electricity, water and wastewater, and more.

The borough government collects extraordinarily high levels of revenue per resident. In FY 2013, the borough collected roughly $1.1 billion, or about $52,000 per resident. For the purpose of comparison, the municipality of Anchorage (which provides analogous services) collected roughly $3,700 per resident. As another point of reference, Falls Church, Va., which Forbes magazine rated as the wealthiest county in America in 2014, collected roughly $7,700 per resident (see Figure 4).

Figure 3: Alaska statewide oil production


3.1.2.1 Borough-level experience in North Slope region, AK

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Figure 4: Government revenue per capita in FY 2013

Data sources: North Slope Borough, New York City, Falls Church County (VA), Anchorage (AK), and Los Angeles city FY 2013 Comprehensive Annual Financial Reports and U.S. Census Bureau.
The borough raises most of its revenue from property taxes, and oil and gas property (including TAPS) accounts for roughly 98 percent of total property valuation. Since 2005, property tax revenues have grown from roughly $198 million to nearly $350 million, accounting for more than 60 percent of total revenues. In Alaska, the top property tax rate allowed by law on oil and gas exploration, production, or transportation property is 20 mills (0.2 percent), and the North Slope Borough has one of the highest property tax rates in the state at 18.5 mills.

The Borough’s second-largest source of revenue comes from its earnings from a permanent fund worth roughly $600 million, which generated $88 million in 2014 (North Slope Borough Finance Department 2005-2014). Each year, a minimum of 25 percent of the borough’s unrestricted general fund balance is deposited into the permanent fund, and no more than 8 percent of the permanent fund may be used in any given year.

The Borough also generates revenue from services provided in “Special Area 10,” which refers to the Prudhoe Bay area, and where borough staff manage utilities and waste disposal services. In addition, oil and gas companies pay $7.5 million annually (increasing at 3.1 percent per year) for “economic impact assistance,” which is designed to offset costs for any additional demand for services brought about by the oil and gas workforce.8

These high levels of revenue have helped provide generous budgets for a variety of services, including several programs that other local governments are typically not able to afford. For example, the borough finances a robust research program through its Department of Wildlife Management. This program includes in-depth research on topics such as subsistence fishing and hunting for native Alaskan communities, documenting populations and movements of wildlife such as caribou, whales, and seals, and researching the impacts to wildlife populations from onshore and offshore oil and gas development (North Slope Borough Finance Department 2015).

Surprisingly, there are relatively few direct or indirect costs for the borough associated with oil and gas development on the North Slope. All major oil industry operations are based in the city of Deadhorse, and services such as road construction/maintenance/repair, public safety, electricity, sanitation, and other services are supplied by the companies themselves. As noted above, the borough supplies limited utility and landfill services, but these are entirely funded by associated fees charged to the operators. In addition, the lack of roads connecting cities (most cities must be accessed by airplane or boat when sea ice has thawed) in the North Slope means that industry traffic in Deadhorse does not affect demand for road repairs in other parts of the borough.

8 Based on interview with Rob Elkins, North Slope Borough Director of Administration and Finance, on June 5, 2015 in Barrow, AK.
Indirectly, demand for services from the industry is also surprisingly limited. In 2011, state estimates showed only 69 oil and gas workers residing in the North Slope Borough (Alaska Department of Labor and Workforce Development 2013). As described above, a larger share of the oil and gas workforce lives in southern cities and either commutes to the North Slope or works in regional headquarters in cities such as Anchorage.

To date, oil and gas activity has been extremely positive for the borough’s finances. However, the North Slope faces a number of long-term challenges similar to those of other Alaska local governments. The primary challenge is heavy reliance on oil and gas property for revenues. Reduced investment in Prudhoe Bay and surrounding oilfields could reduce property tax revenues, and local officials are considering a move to fund government operations primarily from their permanent fund rather than property taxes.

However, the director of administration and finance estimates that this would require a permanent fund balance of roughly $10 billion, far beyond the current level of $600 million. Without a dramatic increase in contributions to the fund in future years, it appears unlikely that a $10 billion balance is feasible.9

3.1.2.2 Municipal-level experience in North Slope region, AK

3.1.2.2.1 Barrow, AK

Barrow (pop. ~4,400) is one of the northernmost cities in the world, sitting at the northern tip of Alaska and dividing the Beaufort from the Chukchi Sea. Though it is the closest city to Prudhoe Bay and other North Slope oilfields, just 34 oil and gas industry workers were estimated to be living in Barrow in 2011 (Alaska Department of Labor and Workforce Development 2013). The city’s largest employer is the North Slope Borough government.

The North Slope Borough provides most services throughout the region, and cities provide just three: recreation, maritime port oversight (for the few weeks of the year when sea ice does not block access), and cemetery maintenance. Barrow relies primarily on grants from the state government to fund these services, along with funds from gaming operations run by the city and revenues from a city-owned gravel pit. Because the region is so remote and supplies must be flown in or brought by barge during the few weeks of summer when sea ice has thawed, gravel sales are an important part of government revenues for a number of municipalities in the North Slope.10

9 Based on interview with Rob Elkins, North Slope Borough Director of Administration and Finance, on June 5, 2015, in Barrow, AK.

10 Based on interview with Barrow special assistant to the mayor Rochelle Leavitt, June 5, 2015 in Barrow, AK.
Despite its proximity to Prudhoe Bay, Barrow sees little in the way of direct revenues or costs from the oil and gas industry. As noted above, few industry workers live in Barrow (a large portion of the population is native Alaskan and relies largely on subsistence hunting), and no oil and gas operations occur within or near the city’s borders.

Looking forward, if new drilling activity in the Chukchi Sea results in substantial production, it will likely see increased impact from the oil and gas industry workforce commuting to offshore platforms from Barrow, the nearest city. Perhaps the largest oil- and gas-related issue for Barrow is its heavy reliance on state grant funds, which—as noted above—are overwhelmingly reliant on declining oil and gas revenues.

### 3.2 California

Though often not thought of as a major oil- and gas-producing state, California has a long history of onshore and offshore oil production; it currently ranks third in oil production among US states. Natural gas production is less significant, though California still ranks 13th nationally. In recent years, substantial interest has arisen in the Monterey shale formation, which underlies much of California’s central valley and large portions of its southern and central coastlines. In 2011, a report commissioned by the U.S. Energy Information Administration assessed technically recoverable resources (TRR) in the Monterey to be roughly 14 billion barrels, more than three times greater than the Bakken shale (U.S. Energy Information Administration 2011). However, more information about the difficulty of extracting the oil led to a major downward revision to 600 million barrels of TRR in 2014 (Reuters 2014), and drilling in the Monterey shale has been modest to date.

California applies no statewide severance tax (it does collect a small fee, called a production assessment, on oil and gas to support the state’s Department of Conservation), but local governments collect ad valorem property taxes on oil and gas property, including surface equipment and underground reserves. Most of these property tax revenues flow to school districts, followed by counties and, to a lesser extent, municipalities and other local government entities. Because of a 1978 voter-approved ballot measure known as “Prop 13,” the assessed value of property in California may not increase by more than 2 percent each year unless it is sold (CA Code of Regulations 2015), which in some cases limits the taxable value of oil and gas properties.

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<thead>
<tr>
<th>Major revenue source(s)</th>
<th>Property tax</th>
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<td></td>
<td>Roads</td>
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<td></td>
<td>Staff costs</td>
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<tr>
<td>Net fiscal impact</td>
<td>Roughly neutral to medium net positive</td>
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</tbody>
</table>
Local fiscal effects of oil and gas development in eight states

Raimi and Newell

Table 12. California Municipality Summary

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<thead>
<tr>
<th>Major revenue source(s)</th>
<th>Sales tax</th>
<th>Lease revenue</th>
<th>Local severance tax</th>
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<tr>
<td>Major cost(s)</td>
<td>Legacy environmental costs</td>
<td>Staff costs</td>
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<tr>
<td>Net fiscal impact</td>
<td>Medium net negative to large net positive</td>
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3.2.1 Los Angeles basin region, CA

Oil has been produced commercially in and around Los Angeles County since the late 1800s and played a substantial role in the region’s economy for decades. But as Los Angeles developed as a center of other industries such as entertainment, transportation, and finance, oil production faded into the background of the region’s economy. Nonetheless, oil still famously seeps to the surface at the La Brea Tar Pits, and hundreds of wells are drilled each year in the city and county of Los Angeles. This includes oil and gas wells drilled near the center of downtown Los Angeles and Beverly Hills, where oil rigs are shrouded in decorative, colorful sound-proofing. Oil production in the region has declined slowly but steadily for decades as fields mature and natural pressures decline. Natural gas production, on the other hand, has roughly doubled since 2000 (see Figure 5). Large governments like Los Angeles County and City feel little fiscal impact from oil and gas activity due to their diverse economies. However, some smaller local governments in the region experience substantial fiscal effects—some positive and some negative—as we describe below.

Figure 5: Los Angeles County oil and gas production

![Figure 5: Los Angeles County oil and gas production](image)

Data source: DI Desktop
3.2.1.1 County-level experience in Los Angeles basin region, CA

3.2.1.1.1 Los Angeles County, CA

For small, medium, or even large counties, the scale of revenues and costs associated with oil and gas production would be substantial. However, Los Angeles is the most populous county in the United States, with 10 million in population and roughly 2,500 inhabitants per square mile (Cook County, IL, the second most populous county, is home to about 5 million). As a result, the oil and gas industry plays an insignificant role in county public finances.

In FY 2014, the assessed valuation of oil and gas property in Los Angeles County was roughly $5.3 billion, up from $3.8 billion in FY 2012 (California Board of Equalization 2014). However, county-wide assessed valuation for all property in FY 2014 was $1.145 trillion (LA County Auditor-Controller 2014), meaning that oil and gas property accounted for roughly 0.5 percent of the total. According to local officials, oil and gas revenues are not a consideration when creating the annual county budget. In 2014, the county collected royalties of $2.435 million from a variety of oil and gas leases near the city of Long Beach.\(^{11}\) However, total revenues were $17.9 billion in the same year, indicating how small oil- and gas-related revenues are for the county as a whole.

Similarly, costs associated with the oil and gas industry are negligible for the county. While industry-related vehicle traffic and employment likely has some effect on demand for services, these issues are simply not large enough to warrant concern in such a large and diverse economy.

3.2.1.2 Municipal-level experience in Los Angeles basin region, CA

Unlike the county as a whole, several cities in Los Angeles County are substantially affected by oil and gas development in and around their borders. For some of these cities, oil production plays an important role in government finance while for others, the effects are small.

3.2.1.2.1 Los Angeles, CA

The city of Los Angeles (pop. ~3.9 million), like the county that surrounds it, experiences relatively minor fiscal effects from oil and gas development because of its large and diverse economy. The leading revenue source for the city associated with oil and gas activity is roughly $4 million per year in franchise taxes applied to pipelines that flow underneath the city. Most of these pipelines transport crude oil from producing fields to refineries or other distribution points. The city also leases a small amount of land for oil and gas production, which generates roughly $350,000 per

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\(^{11}\) Based on phone interview and email communication with Los Angeles County Assistant Treasurer and Tax Collector Glenn Byers. Phone call on January 29, 2015, with email correspondence through August 8, 2015.
A ballot measure in 2011 proposed to add a tax of $1.44 per barrel produced within city limits, but the measure failed. Oil and gas production also supports sales and property taxes, and while local officials are not able to closely estimate the effects, they believe the fiscal impact is very small, as total city revenues in FY 2013 were $13.1 billion (LA City Controller's Office 2014).

Direct costs for the city are also difficult to estimate. Oil and gas vehicle traffic has some effect on city roads, but the volume of traffic in Los Angeles (in part due to the port facilities in Los Angeles and Long Beach) is so large that it is not possible to identify any direct effects. The city has one dedicated staff position designed to coordinate oil and gas issues between the city’s administrative office, attorney’s office, and planning/zoning office.

A final note is that because of its size and financial assets, Los Angeles has since 2005 owned producing natural gas assets in the Pinedale field in southwestern Wyoming. The city is a large consumer of natural gas, and it imports a substantial share of the gas it consumes from the Pinedale field. This arrangement provides a hedge for the costs of the city government’s energy consumption.

3.2.1.2.2 Long Beach, CA

Long Beach (pop. ~470,000) occupies an unusual and perhaps unique position in terms of local government relationships with the oil and gas industry. Due to a complex series of negotiations and legal proceedings with the state of California through the first part of the 20th century, the city government is the working interest of the giant Wilmington oil field, which lies beneath part of the city and its harbor in an area known as the Tidelands. As the working interest, Long Beach is responsible for investment decisions such as where and when to drill wells, which companies to hire to perform oilfield services, and how to plan for the future of the oilfield. Because of this position, the city enjoys substantial profits from oil and gas production, much of which is used to fund city services and capital projects. In 2014, the Long Beach Gas and Oil Department earned a profit of roughly $67 million from its stake in the field, administrative fees associated with permitting and inspection, pipeline franchise fees, and a city-wide production tax of $0.48 per barrel of oil. For context, sales and property tax revenues for the city in FY 2013 (the most recent available year) combined to total roughly $267 million (Office of Long Beach City Auditor 2014).

Other government revenues such as property taxes and sales taxes are supported by oilfield service firms and the local oil- and gas-workforce. However, the precise contributions of these

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12 Based on interview with Los Angeles Finance Specialists Jacob Wexler and Melissa Krance, and Senior Administrative Analyst Alvin Newman, on April 25, 2015, in Los Angeles, CA.
sources is unclear, and local officials believe that they are small relative to the income generated by
the Gas and Oil Department.\(^\text{13}\)

Oil and gas development has also caused challenges for the city. In the 1940s and 1950s, as
oil was pumped from beneath beaches and coastal neighborhoods, parts of the city sank by as much
as 25 feet, creating flooding hazards and large-scale property damage (Colazas & Strehle 1995). A
partial drilling ban was implemented in the 1950s, during which time city officials and oil companies
experimented with ways to reduce subsidence. In 1964, a voter referendum lifted the ban and
allowed drilling to resume across the field, but with new safeguards to prevent additional subsidence.
The city constructed four man-made islands in Long Beach Harbor, where operations now take
place. From these islands, the city pumps millions of gallons of mostly reclaimed water into the oil
reservoirs, which keeps reservoir pressure high to prevent subsidence, and which also helps push oil
out of the ground and up through new and existing wells.

The Wilmington field has produced more than one billion barrels of oil, and production
continues at a steady pace. However, as production declines and eventually ceases in the coming
decades, the city will need to continue pumping water into the producing formations to keep
pressure high in the reservoir. It is uncertain how long the city will need to continue pumping in
water and there are no current plans for decommissioning the four man-made islands that mark the
harbor. The state of California has saved some $300 million for this purpose, but local officials
suspect these funds will be insufficient.

Other public costs associated with oil and gas development such as heavy industry traffic are
minimal, in part because the city’s massive port complex has far more truck traffic than simply that
related to oil and gas operations. Looking forward, utilization of oil and gas revenues is a key issue
for budget planning. Currently, 100 percent of oil and gas revenues is budgeted for ongoing
government operations (the previous formula of 70 percent for operations and 30 percent for capital
projects was recently adjusted), and with the rapid fall in oil prices in late 2014 and early 2015,
revenues are unlikely to meet budgeted expectations. Local officials are concerned that dependence
on volatile oil and gas revenues will continue to cause budgeting challenges if the city relies on these
funds for recurring expenses and long-term obligations.

3.2.1.2.3  Signal Hill, CA

Oil production in Signal Hill (pop. ~11,000), which sits between Long Beach and the city of
Los Angeles, began in earnest in the 1920s. The oil industry provided the economic foundation to

\(^{13}\) Based on interview with Chris Garner, director, and Kevin Tougas, operations manager, of the Long Beach Gas and
Oil Department, on February 24, 2015, in Long Beach, CA.
build the city through the first half of the 20th century. In this respect, oil has been a positive for the city’s residents and its public finances. However, as oil production has slowed, Signal Hill has had to cope with a range of environmental problems caused by old oil wells and deteriorating pipelines. As a result, the effect of the oil industry on city finances today is negative.

**Figure 6: An oil well blows out in Signal Hill, CA circa 1922**

![An oil well blows out in Signal Hill, CA circa 1922](image)

Photo courtesy of the City of Signal Hill. Believed to be of the blowout at the Black and Drake well of 1922.

Like some other cities in southern California, Signal Hill applies a $1 per barrel tax on oil produced within its borders. Through the 1970s, this tax raised upwards of 70 percent of the city’s general revenues. But as oil production has declined, revenues have declined, raising between $700,000 and $1.1 million per year over the past five years, roughly 5 percent of the city’s general revenues.14 Signal Hill also collects roughly $150,000 per year on annual permitting fees for active and inactive wells, along with roughly $250,000 per year from franchise fees on crude oil pipelines.

While these revenues help support an array of city services, City Manager Ken Farfsing states: “There’s probably not enough money in the world to clean up what’s beneath Signal Hill.” Legacy pollution caused by the oil industry is a major issue for the city, and the leading challenge today relates to unmapped and degrading oil pipelines that are 75 years old or older. The city spends roughly $150,000 per year plugging abandoned wells and $25,000 per year removing abandoned oil pipelines, but this spending has not been—and will not be—sufficient to clean up the widespread damage to the subsurface.

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14 Based on interview with Signal Hill city manager Ken Farfsing and director of finance Terri Marsh, Feb. 23, 2015, in Signal Hill, CA.
In addition to this spending, legacy oil issues raise the cost of construction, reducing private investment and raising the costs of public projects. Local officials estimate that building in Signal Hill costs $2 more per square foot compared with the rest of Los Angeles County, as companies must spend extra to clean up contaminated soil and plug abandoned wells. In addition, property rights in Signal Hill were divided thousands of times to allow investors to purchase shares in individual oil wells or leases. As a result, some parcels, such as one purchased by the city for a new police station in the 2000s, are technically owned by thousands of individuals and businesses. Purchasers of these properties must spend substantial sums on legal fees and other costs to identify and contact all of the legacy owners, many of whom likely passed away generations ago.

3.2.1.2.4 Culver City, CA

Culver City (pop. ~39,000) is a small city carved out of a portion of western Los Angeles. The city is home to several large movie studios, and its public finances are tied heavily to property and sales taxes supported by the entertainment industry. The city abuts a portion of the Inglewood oilfield, which has produced oil and gas for decades and lies atop the Baldwin Hills neighborhood of Los Angeles. In recent years, developers have expressed interest in drilling directionally from the oilfield to extract oil from beneath portions of Culver City.

Currently, the city generates no substantial revenue from the oil and gas industry, as no wells are located within city limits. However, Culver City recently spent thousands of dollars on staff time and consultants to prepare for the new wells that may be drilled in the coming years. In part due to opposition to drilling from environmental groups and local residents, the city has invested substantially in environmental reviews and the development of regulations to manage future oil and gas activity.\(^ {15}\) As a result, preparations for potential oil and gas activity within city limits have led to a modest net financial negative for Culver City. If development occurs, this fiscal impact may turn positive.

3.2.2 Kern County region, CA

Kern County (pop. ~864,000) lies just over the Grapevine Canyon, north from Los Angeles County in the state’s Central Valley. Kern is a much more rural county than its southern neighbor, and is responsible for more than 70 percent of California’s oil production. Since the early 20th century, when oil was discovered in giant reservoirs such as the Midway-Sunset, Elk Hills and Kern River fields, the county’s economy has largely centered on oil and gas. Over the decades, other sectors such as agriculture and military installations have added diversity to the economy, and the

\(^ {15}\) Based on interview with Culver City Planning Division project manager Sherry Jordan and chief financial officer Jeff Muir, Feb. 25, 2015, in Culver City, CA.
county’s population has more than doubled since 1980. Nonetheless, oil and gas production is still a major economic driver for the region.

All of the major oilfields in Kern County have been in decline for decades, and most industry operations in the region focus on enhanced recovery techniques to maintain existing levels of production (see Figure 7). Interest in the Monterey Shale has been substantial, but the formation has been challenging to tap economically and new drilling activity has been modest.

**Figure 7: Kern County oil and gas production**

3.2.2.1 County-level experience in Kern County region, CA

3.2.2.1.1 Kern County, CA

Oil and gas activity is a fundamental part of Kern County’s economic base, and although the industry imposes substantial costs on county infrastructure, particularly roads, the revenues generated by oil production more than offset these demands for services.

Oil and gas production has declined steadily in Kern County, but the assessed value of oil and gas property has grown substantially, partly due to higher oil prices and partly due to steady investment in new oilfield equipment (see Figure 8). Property taxes are the largest source of general fund revenues for Kern County and oil and gas had provided more than half of these revenues for decades. As other industries have grown this share has fallen somewhat, and oil and gas in 2013 and 2014 accounted for roughly one-third of county-wide assessed values despite remaining near all-time highs (Kern County Assessor's Office 2015). With the oil price drop in 2014, property values will likely fall.
Other sources for the county include sales tax revenues from petroleum products and oilfield equipment, which raised roughly $10 million in FY2014,\(^\text{16}\) nearly 20 percent of total sales tax revenues (Kern County Auditor 2003-2014). The county generates roughly $1.8 million per year in franchise fees from oil and gas pipelines, and received $340,000 in royalties from oil produced on county-owned land in FY 2014. In addition, the leading oil and gas company in the region has made substantial contributions to the county government, including $350,000 for a county-wide economic development study intended to promote economic diversity, and $250,000 to provide services to veterans across the county.

County roads are heavily affected by industry traffic, particularly in the rural western portion of the county. The precise costs associated with this damage is uncertain, but local officials say the effects are substantial. Law enforcement issues around the oilfields have also grown in recent years, primarily due to theft of oilfield equipment from wellpads and other infrastructure sites. In addition, the county recently needed to purchase specialized firefighting equipment, including a $1 million fire truck, to prepare for potential emergencies associated with increased oil-by-rail traffic. Finally, the county devotes substantial staff resources to oil and gas issues, particularly in the assessor’s office, where 15 to 20 people are devoted to oil and gas property tax issues.

\(^{16}\) Based on interview with Kern County Assistant County Administrator Nancy Lawson, Finance Director Teresa Hitchcock, and Assistant Assessor Lee Smith, Feb. 26, 2015, in Bakersfield, CA.
3.2.2.2 Municipal-level experience in Kern County region, CA

Cities in Kern County are supported directly and indirectly by the oil and gas industry. We visited two of the largest cities in the county, and found that the net fiscal effects for both have been clearly positive.

3.2.2.2.1 Bakersfield, CA

Bakersfield (pop. ~364,000) is the county seat and largest city in Kern County. The city has grown rapidly in recent decades, and although other economic sectors have made up the bulk of this growth, the oil and gas industry is still a large part of the city’s economic and employment base. While there are some oil wells within city limits, most of the sector’s effects are indirect through employment and corporate offices. As a result, costs associated with the industry have been modest, and the net fiscal impacts have been large and positive.

The leading general revenue source for Bakersfield is sales taxes ($70 million in 2013), and the oil and gas workforce supports this revenue stream. Although the precise share attributable to oil and gas employees and business are uncertain, local officials describe the effect as large.17 Property taxes are a large source of revenue for Bakersfield ($59 million in 2013), and are also supported by the oil and gas sector, partly through oil and gas wells within city limits, and more substantially by oil and gas firms and employees paying property taxes on homes and businesses across the city (Bakersfield Financial Services Department 2003-2013).

Direct costs for the city are minimal, as most oil and gas drilling occurs outside of the city, limiting impacts to roads and other services such as law enforcement. Indirect costs associated with the oil and gas workforce are substantial, however, and include every major aspect of city services. Local officials report that changes in demand for services such as law enforcement are not affected by changes in oil and gas activity, but are instead more closely tied to cycles in the agricultural sector, which involves a large number of transitory workers. The city does occasionally struggle with workforce retention, particularly in their Information Technology department, but the challenges are relatively small for its large workforce of roughly 1,500 full-time employees.

3.2.2.2.2 Shafter, CA

Shafter (pop. ~17,000) sits just north of Bakersfield, and has benefited substantially from oil and gas industry activity in the region. The city is located at the nexus of several major rail and highway routes, allowing it to attract oilfield service companies to locate within their borders. As a

17 Based on interview with Bakersfield finance director Nelson Smith, Feb. 27, 2015, in Bakersfield, CA.
result, the city sees a variety of revenues from the industry despite limited drilling activity within and around the municipal borders.

Sales taxes are the leading general fund revenue source for Shafter, and oil and gas companies contribute an estimated $3 million per year to these revenues,\(^\text{18}\) roughly 25 percent of total sales tax collections (Shafter Finance Department 2003-2014). Property taxes are supported by the oil and gas service firms located within the city, but these provide a small portion of the city’s annual revenues. More substantial revenue sources come from the use of a city-owned rail spur by an oil and gas service firm, which generated roughly $800,000 in 2014, and the surface lease of some city-owned land, which generates roughly $100,000 per year.

Shafter also experiences costs associated with the industry, primarily associated with vehicle traffic. Heavy vehicles utilize city streets and contribute to wear and tear, though local officials say the damage is easily managed. In addition, city police frequently provide traffic services such as road closures to accommodate oil and gas industry traffic. Shafter also competes with the oil and gas sector for workers, but local officials report that workforce retention is not a major challenge.

### 3.3 Kansas

Most counties in Kansas’ southern Mississippian Lime region have faced substantial challenges managing costs associated with oil and gas production. The rural nature of the region, a large increase in heavy truck traffic, and tax policies that tend to exacerbate revenue volatility have combined to create challenging fiscal conditions. In most other regions, local infrastructure is more mature and industry activity has been more modest. While revenue volatility has been a concern for these counties as well, most have experienced net fiscal benefits from oil and gas activity.

Each of the municipalities we examined has experienced net positive fiscal impacts from the industry. Sales taxes, supported by the oil and gas workforce, has been the primary revenue source, along with a number of cities that receive revenue from leases on city-owned property. However, city roads in the Mississippian Lime region have experienced damage from oil and gas vehicle traffic, and many cities across the state struggle to retain their workforce due to competition for labor from the industry.

For county governments across Kansas, one common concern relates to the process by which oil and gas properties are valued. Each year, the state issues a guide for county assessors to appraise their county’s oil and gas property. The process is complex, and a number of lawsuits have

\(^{18}\) Based on interview with Shafter city manager Scott Hurlbert, Feb. 27, 2015 in Shafter, CA.
arisen due to disagreements between county assessors and oil and gas companies about the proper way to interpret certain definitions within the state-issued guide.

In addition, oil and gas properties are valued annually based on commodity prices on a single date: Jan. 1 of each year. For example, if oil prices are $100/barrel on Jan. 1, counties and other taxing entities such as school districts will receive revenue based on $100/barrel oil, regardless of price fluctuations throughout the course of the year. If, on the other hand, oil is selling for $50/barrel at the time of valuation, annual revenues will be based on this price, even if prices rise substantially later in the year (KS Department of Revenue 2015a).

This methodology has the tendency to exacerbate, rather than smooth out, the volatility of property tax revenues for local governments (not to mention taxpayer payments). Because of this volatility, local officials in most of the counties we examined are mindful of the need to save revenues in their reserve funds during high-price years, then use those reserves to cushion shortfalls.

A final fiscal issue for county governments in Kansas is related to allocations of the state’s severance tax. According to statute, portions of the severance tax are to be allocated to county governments and school districts through two mechanisms: the mineral production tax fund and the Oil and Gas Valuation Depletion Fund (Kansas Statutes Annotated 2014). However, the state has in recent years withheld, or “swept,” some of these revenues to use for state government needs. As a result, county governments have seen less revenue to manage impacts than they may have expected. A number of local officials we interviewed expect allocations from the Depletion Fund to shrink to zero in the coming years.

### Table 13. Kansas County Summary

<table>
<thead>
<tr>
<th>Major revenue source(s)</th>
<th>Property tax</th>
<th>Severance tax allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major cost(s)</td>
<td>Roads</td>
<td>Legal costs/property tax rescission</td>
</tr>
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<td></td>
<td></td>
<td>Workforce retention</td>
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<tr>
<td>Net fiscal impact</td>
<td>Roughly neutral to large net positive</td>
<td></td>
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</table>

### Table 14. Kansas Municipality Summary

<table>
<thead>
<tr>
<th>Major revenue source(s)</th>
<th>Sales tax</th>
<th>Lease revenues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major cost(s)</td>
<td>Roads</td>
<td>Workforce retention</td>
</tr>
<tr>
<td>Net fiscal impact</td>
<td>Small to large net positive</td>
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</tr>
</tbody>
</table>
3.3.1 Mississippian Lime region, KS

The Mississippian Lime region lies just across the border from Oklahoma in southern Kansas, and has produced oil for decades (we discuss experiences on the Oklahoma side of the border in Section 3.6.2.) The Mississippian is not a shale formation, but certain counties have seen a major increase in oil and gas drilling and production in the last several years. The application of horizontal drilling and hydraulic fracturing to the limestone has dramatically increased production, particularly in Harper and Barber Counties. We also examine Ellis and Barton counties, which lie roughly 150 miles north and have historically produced larger quantities of oil. While all four counties are underlain by the Mississippian formation, the bulk of new production (and fiscal impact) has occurred in the more southern counties of Harper and Barber (see Figure 9).

Figure 9: Oil production in Kansas’ Mississippian Lime region


3.3.1.1 County-level experience in Mississippian Lime region, KS

3.3.1.1.1 Barber County, KS

Local officials in Barber County (pop. ~5,000) report that increased oil and gas activity has been a net fiscal benefit for the county government, but the experience has been mixed. While revenues have increased substantially, a variety of costs and demand for services have grown nearly as quickly. In addition, the county currently faces a lawsuit over its methodology for assessing millions of dollars’ worth of oil and gas property. If the county loses the suit, it stands to lose a substantial portion of its tax base and would be forced to repay taxes collected in previous years.
Property taxes are the largest revenue source for Barber County, and oil and gas property has substantially driven up tax receipts in recent years. By 2014, oil and gas property (mostly consisting of the value of production) accounted for 63 percent of county-wide valuation (KS Department of Revenue 2015b). In 2013, the county also received nearly $3 million in allocations from the state Oil and Gas Depletion Trust Fund, where a portion of the Kansas’ severance tax is deposited (KS Department of Administration 2009-2014). However, these revenues have been volatile due to occasional revenue “sweeps,” where the state government retains funds statutorily allocated to local governments (audited financial statements were only available for 2013).19

Sales tax revenue has also grown due to increased economic activity associated with oil and gas development, but local officials are unsure how to quantify the magnitude of the effect. The county received roughly $100,000 for an oil and gas lease on county land, but no production has yet occurred. Finally, operators have made several small in-kind contributions to county EMS and fire services, but have not helped with road maintenance or repair.

Bridge costs associated with heavy industry vehicle traffic have been the leading challenge for the county (townships maintain most of the rural roads in Barber County). The county is responsible for more than 300 bridges, and costs have grown by roughly 40 percent in recent years to simply maintain conditions. The second leading challenge has been a lawsuit involving the valuation of oil and gas property, which has cost the county roughly $150,000 and a large amount of time. If the county loses the suit, its tax rolls may decrease substantially and it would be required to repay hundreds of thousands of dollars of taxes collected in previous years.

Other costs have been notable, but more easily managed. The county has seen a modest increase in demand for EMS, sheriff, jail, and judicial services, which they attribute primarily to oil and gas activity. These demands peaked in 2013, during the most active drilling periods, and have since declined. Barber County added five new staff members to handle a variety of increased administrative demands in departments such as the county treasurer, clerk, and appraiser. In the road and bridge crew, the county has struggled to attract and retain a qualified workforce attracted to higher pay in the oil and gas sector. Finally, county commissioners and other staff note that they have had large opportunity costs, devoting many hours to the oil- and gas-related lawsuit over property valuation, property records requests, and disputes over land ownership in certain parts of the county.

19 Based on interview with Barber County commissioners Steven Garten and Paul Harbaugh, and county clerk Debbie Wesley, March 16, 2015, in Medicine Lodge, Kansas.
3.3.1.1.2 Barton County, KS

Barton County (pop. ~27,500) is more densely populated and has been less heavily affected by Mississippian Lime development than Barber and Harper counties 150 miles to the south. Barton County primarily produces oil, and production has been relatively flat in recent years, with most production coming from stripper wells that are assessed for property taxes at a lower rate than wells producing larger quantities of oil or gas (KS Department of Revenue 2015a). Despite this limited new activity, local officials describe the oil and gas industry as contributing substantially to the fiscal health of the county, primarily through property taxes.\(^2\)

County-wide property valuation has grown substantially in recent years, from $197 million in 2005 to $270 million in 2014 (Barton County KS Clerk's Office 2015). Oil and gas property made up 23 percent of these values in 2014 (KS Department of Revenue 2015b), but have contributed relatively little to the overall growth in property values across the county. Allocations from the Oil and Gas Depletion Trust Fund have totaled roughly $1.8 million total over the past several years, a relatively modest sum for a county with total primary government revenues of nearly $23 million in 2014. The county also has a sales tax which is supported in part by oil and gas service firms, but local officials estimate that the contribution of these firms is small relative to larger retail sector of the economy.

Damage to roads and bridges is the largest oil- and gas-related cost for the county, which maintains over 1,200 bridges and culverts, all of which are affected by oil and gas vehicle traffic. However, local officials state that their infrastructure is in good condition and that the damage caused by the oil and gas sector is manageable. The county has not experienced any other substantial costs associated with the industry in recent years.

3.3.1.1.3 Ellis County, KS

Ellis County (pop. ~29,000) lies just northwest of Barton County, and the fiscal effects of the oil and gas industry are similar. While oil and gas is a substantial part of the county’s property tax base, there has not been substantial growth in drilling or production in recent years, and local officials describe the industry as a steady and positive contributor to the county’s fiscal health.

Oil and gas property accounted for 25 percent of county-wide valuations in 2014 (KS Department of Revenue 2015b), though this figure fluctuates from year to year based on oil and gas prices. Local officials expect 2015 property tax revenues to fall by roughly $2 million because of

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\(^2\) Based on interview with Barton County administrator and counselor Richard Boeckman, March 15, 2015 in Great Bend, KS.
lower oil prices. The county has received a total of $1.7 million from the Oil and Gas Depletion Trust Fund in recent years. However, local officials believe that this revenue source will decrease to zero in the coming years because revenue shortfalls at the state level may lead state lawmakers to retain the portion of the Trust Fund that is statutorily allocated to local governments. In the context of Ellis County’s 2014 general fund budget of roughly $22 million, this loss of revenue will be meaningful, but not devastating.

Similar to Barton County, the oil and gas industry has a substantial effect on Ellis County’s roads and bridges. However, there has been no major increase in vehicle traffic in recent years, and the county does not struggle to manage damage associated with oil and gas vehicles. Because the county contains hundreds—perhaps thousands—of decades-old wells, the county fire, EMS, and law enforcement services all spend time managing issues that arise at or around well sites. This includes fires, accidents, and occasional thefts of equipment from oil wells. However, local officials describe these service demands as relatively modest, and easily manageable with current revenues.

Staff costs associated with oil and gas property are substantial. In particular, the county appraiser devotes a large portion of time assessing oil and gas properties, keeping track of property owners, and managing the complex oil and gas valuation process. This amount of staff time has meant some measure of opportunity costs, though local officials primarily see time devoted to oil and gas issues as a longstanding part of the job. Workforce retention has in recent years been a challenge for the county, particularly for the road and bridge crew though, with lower oil prices, this challenge may fall as oil and gas companies lay off staff.

### Harper County, KS

Harper County (pop. ~5,900), which neighbors Barber County to the east, has seen a large increase in oil and gas activity. This increase has generated substantial new revenues, demands for services, and concerns about the future. While local officials described the net fiscal impact as roughly neutral in early 2015, they believe that a backlog of repair needs to county roads coupled with property damage associated with earthquakes from oil and gas wastewater disposal may result in a long-term negative fiscal impact.

As in other Kansas counties, property tax revenues have been the leading driver of fiscal benefits for Harper County, with county-wide valuations growing from $33 million in 2012 to $60 million in 2014. This increase is entirely attributable to oil and gas property, which in 2014 made up roughly half of the county’s assessed valuation (KS Department of Revenue 2015b). Allocations from the state Oil and Gas Depletion Trust Fund have also been substantial, increasing from

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21 Based on interview with Ellis County administrator Greg Sund, March 17, 2015, in Hays, KS.
roughly $500,000 in 2013 to roughly $1.9 million in 2014. These revenues have led the growth of total revenues from roughly $12 million in 2009 to nearly $20 million in 2014, and the county’s end-of-year fund balance has swelled from roughly $10 million to $16.5 million over the same period (KS Department of Administration 2009-2014). Smaller revenue sources include increased revenues from permit fees, roughly $150,000 for an oil and gas leasing bonus on county property, and some modest in-kind contributions from operators to help with road repairs and expanding ambulance service to 24 hours/day.

Road and bridge damage has been the leading cost for Harper County, and at times it has not been able to keep up with demand for repairs. Local officials report that roads are in worse condition than before oil and gas activity increased. Although they are not sure of the overall damage costs, they note one example of a $1 million repair job to a single bridge caused by damage from heavy oil and gas vehicles. Harper County planners have worked with oil and gas companies to direct heavy vehicles to use designated routes, but these routes have been ignored by some drivers—particularly subcontractors. The county has also expanded ambulance service to operate 24 hours a day, adding roughly $500,000 per year in additional costs and a one-time facilities upgrade of $415,000. Local officials note this expansion has been a mixed blessing as residents benefit from the round-the-clock service, but the county must bear the increased expenditure.

A final issue relates to earthquakes caused by oil and gas wastewater injection in southern Kansas and northern Oklahoma (Walsh & Zoback 2015). These quakes have damaged the county courthouse, which is over 100 years old and the tallest building in Harper County. Local officials are not certain of the costs, but they note that repairs will be needed and may be expensive enough to make office relocation a necessity. In addition, a number of residents in the county have seen cracks in their walls and foundations which they attribute to earthquakes, potentially reducing the value of the county’s property tax base. Ratings agencies have taken note of this issue and described the risks to property values (Standard and Poor's 2015).

### 3.3.1.2 Municipal-level experience in Mississippian Lime region, KS

#### 3.3.1.2.1 Anthony, KS

Anthony (pop. ~2,300) is the seat of Harper County in southern Kansas. While Harper County has struggled to manage road damage associated with the industry, the net fiscal impact for Anthony has been a large net positive. The city’s end-of-year fund balances have grown from $4.4 million in 2009 to $6.2 million in 2013 (Anthony KS City Manager 2010-2013), driven by a variety of oil- and gas-related revenue sources.

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22 Based on interview with Harper County clerk Cheryl Adelhardt, March 16, 2015 in Anthony, KS.
Prior to oil and gas activity, local officials report that property values across the city were declining. However, population growth and economic activity driven by Mississippian Lime development has helped drive city-wide property values from roughly $9 million in 2010 to $12.4 million in 2015. But because Anthony collects relatively little in the way of property taxes, the largest new revenue source for the city has been $1.05 million for a lease of city-owned land. Anthony has used these revenues to upgrade recreation facilities and help build affordable senior housing. The city has also seen large revenue growth in its electric utility, generating an additional $500,000/year from additional demand from new oil wells operating around Harper County.

Anthony has also seen increased costs in a variety of areas. City streets have been heavily damaged by oil and gas vehicle traffic, and spending on repair and maintenance has grown from $214,000 in 2009 to $249,000 in 2013 (KS Department of Administration 2009-2014). Costs would have been greater had the city not received a $2 million grant from the state to help repair and upgrade local streets. Spending on police has grown more rapidly at 41 percent over the same period, from $287,000 to $404,000. This new spending has been necessary to manage increased police incidents, particularly fights at local bars and restaurants that local officials attribute to the oil and gas industry. The city added one new officer to manage these issues, along with several temporary staff during the most active years of drilling to manage planning and utility growth. Service demands for the fire department have grown, with increased calls responding to vehicle accidents and other oil- and gas-related issues. Workforce retention has also been an issue for Anthony’s electric utility, which has lost several staff and has struggled to fill positions with qualified applicants.

A final issue relates to earthquakes, which we described above in our discussion of Harper County in Section 3.3.1.1.4. Local residents, including the officials we interviewed, expressed concern over damage to property—particularly homes—from earthquakes caused by wastewater injection. Residents have reported cracks in their walls and foundations from these quakes, and local officials are concerned that some may relocate if the quakes continue.

3.3.2.2 Hays, KS

Hays (pop. ~21,000) is the county seat of Ellis County and, as one of the largest cities in northwest Kansas, serves as a retail hub for much of the region. While oil and gas production in the region is substantial, there has been little new activity in recent years. Instead, the local economy is more heavily reliant on sectors such as health care and education. As a result, local officials report

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23 Based on interview with Anthony, KS city clerk and administrator Amber Horbelt, March 16, 2015, in Anthony, KS.
that the city experiences little direct or indirect fiscal impacts from the oil and gas industry, and estimate that the industry makes a small positive contribution to public finances.\textsuperscript{24}

Sales taxes account for more than half of Hays’ annual revenues (KS Department of Administration 2009-2014), and local officials report that purchases associated with the oil and gas workforce are a helpful but small part of the sales tax base. The only other measurable revenue source for the city comes from a small oil and gas lease on city property, which generates a very small sum each year in royalties (precise amounts were small enough not to be reported in the city’s annual financial statements).

The only noticeable cost associated with the industry for the city of Hays relates to workforce retention. The city competes with oil and gas companies for labor, particularly in utility and infrastructure services. However, local officials describe the challenge as small, and note that hiring and retention are also affected by other factors such as high land and housing prices due to the high value of agricultural land.

\subsection*{3.3.1.2.3 Medicine Lodge, KS}

Medicine Lodge (pop. \textasciitilde 2,000), the seat of Barber County in the more heavily drilled southern portion of the Mississippian Lime region, has experienced larger fiscal impacts. Overall, local officials estimate that increased oil and gas activity has had a positive impact on city finances, but they expect the benefit to be a short-term boost, rather than a long-term driver of the local economy and city finances.\textsuperscript{25}

Sales taxes are the leading revenue source for Medicine Lodge and revenues have fluctuated substantially in recent years, growing from $357,000 in 2012 to $600,000 in 2013, then falling back to $367,000 in 2014. Local officials attribute this growth partly to oil and gas development, and partly to the development and rapid growth of wind farms in the region. Transient guest tax revenues, based on hotel receipts, have also grown substantially due to oil and gas, along with wind development. Local officials believe that this increased economic activity also helps support local property values, which make up a small but important tax base for the city. However, local officials are not able to quantify the effect of oil and gas development on this revenue source.

Medicine Lodge has seen some damage to local roads due to oil and gas development (along with wind development, which requires oversize trucks to transport very large stanchions and turbine blades). However, the city has not quantified this cost, and local officials report that the

\textsuperscript{24} Based on interview with Hays city administrator Toby Dougherty, March 15, 2015, in Hays, KS.

\textsuperscript{25} Based on interview with Medicine Lodge city administrator Jeffrey Porter, March 16, 2015, in Medicine Lodge, KS.
impacts have been manageable. Finally, the city has had some challenges with workforce retention as oil and gas activity grew, particularly in 2013.

### 3.3.2 Hugoton region, KS

The Hugoton gas field, one of the world’s largest, is predominately found in southwestern Kansas, with portions of the field stretching south into the Oklahoma panhandle and north Texas. First developed in the 1930s, the Hugoton produces substantial quantities of helium along with natural gas, helping to make the play profitable even during periods of low gas prices. For several decades, production from the field has declined as reservoir pressure decreases and the industry has looked to shale and other unconventional formations. As Figure 10 shows, production in Grant and Haskell counties, two of the largest natural gas producers in the state, have declined by more than 50 percent in the past 14 years. Scott County, roughly 75 miles north of Grant and Haskell, does not produce large quantities of natural gas, but has seen new oil drilling and production in recent years. We examined each of these counties along with one city in the region to see how this variation in industry activity has affected local government finances.

**Figure 10: Natural gas and oil production in select Hugoton region counties**

![Graph showing natural gas and oil production in select Hugoton region counties](image)


#### 3.3.2.1 County-level experience in Hugoton region, KS

##### 3.3.2.1.1 Grant County, KS

Grant County (pop. ~8,000) is one of Kansas’ leading natural gas producers, but has seen little new drilling in recent years. Although production is falling, oil and gas continues to make up a major part of the county’s tax base, and because costs related to new drilling activity are limited, the
net fiscal impacts have been a large net positive both historically and in recent years. Local officials report that the fiscal benefits have outweighed costs and demand for services by a ratio of 100 to 1, enabling the county to invest in major capital projects including a variety of recreational facilities that would not have been otherwise possible.26

As Figure 11 shows, oil and gas property makes up a large share of county-wide valuations, which tend to lag one year behind natural gas prices. As the figure shows, valuations have been volatile, moving up and down according to natural gas prices. Since 2008, when natural gas spot prices peaked near $9/MMBtu, oil and gas property has decreased from roughly 70 percent of county-wide assessed value to 52 percent in 2014. This decrease has driven down total property values from $368 million to $241 million over the same period (Grant County KS Clerk's Office 2015). Because production continues to decline and natural gas prices have remained low, local officials expect valuations, and associated property tax revenues, to stay low for the foreseeable future.

A related concern over property values relates to the classification of certain oil and gas property. In recent years, the Kansas state legislature has considered reclassifying natural gas processing facilities as “personal property,” which would make them exempt from county property taxes. If this change were to occur, Grant County would see a large reduction in its tax base due to the several processing plants currently on its tax rolls, potentially threatening its fiscal health.

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26 Based on interview with Grant County commissioner Martin Long, March 18, 2015 in Ulysses, Kansas.
Allocations from the Oil and Gas Depletion Trust Fund have totaled roughly $2.3 million in the past several years, but as noted in section 3.3.1.1, revenues from this state-allocated fund have been erratic. For example, the county received $2.2 million from the fund in 2012, followed by $286,000 in 2013 (data for 2014 were not available). This unpredictability creates challenges for the purposes of budgeting and long-term planning. The county has also seen helpful in-kind donations of $15,000 to $20,000 per year from companies to the EMS and fire departments, along with assistance in training local first responders for potential emergencies at the county’s many natural gas production, transportation, and processing facilities.

Grant County faces three major cost areas related to oil and gas. First, road and bridge damage is substantial due to heavy industry vehicle traffic. However, the limited amount of new drilling and hydraulic fracturing in recent years means that vehicle traffic has been less than in the Mississippian Lime region. Officials report that roads and bridges are generally in good condition, and that keeping up with demand for repairs is not a major challenge. The county also invests staff time and resources in preparing for emergencies at natural gas facilities, and notes that a substantial share of annual spending on these services is due to concerns over the oil and gas industry.

Finally, workforce retention has been a large challenge for Grant County. It struggles to retain quality staff for its road and bridge crew, as well as in law enforcement due to competition from the oil and gas sector. This has become more acute in recent years, as declining revenues associated with falling oil and gas property values has forced the county to implement a pay freeze.

3.3.2.1.2 Haskell County, KS

Like Grant County, its neighbor to the west, Haskell County (pop. ~4,100) is a rural agricultural community with a long history of natural gas production. New drilling activity has been limited in recent years and, although the county does experience costs associated with the industry, the net fiscal impact of the oil and gas industry is a large positive.

In 2014, oil and gas property accounted for 71 percent of Haskell County’s assessed property values (KS Department of Revenue 2015b). Like Grant County, this valuation is likely to decline in 2015 due to lower oil and natural gas prices, but will still account for the majority of assessed valuations. The only other major revenue source for the county associated with oil and gas development is allocations from the state Oil and Gas Depletion Trust Fund. As in other counties, these revenues have been volatile, creating planning challenges. In 2012, the county received $2.8 million, falling to $456,000 in 2013, then rising to $1.8 million in 2014 (KS Department of Administration 2009-2014). With total general fund revenues of roughly $5 million in 2014, this volatility creates wide swings in overall county revenues. The county also has an oil and gas lease on its land, but these revenues are very small.
Road repair is the largest challenge associated with oil and gas development, but local officials report that costs are manageable and that revenues easily cover demand for repairs. More recently, the county saw a large one-time charge of $250,000 due to a dispute over the valuation of oil and gas property. As discussed in Section 3.3, the oil and gas property valuation process in Kansas is complex, and a previous year’s assessment of property taxes on certain oil and gas property was ruled to be incorrect, resulting in the $250,000 repayment in 2014. The only other substantial cost for Haskell County tied to oil and gas activity has been the addition of one staff member to create geospatial maps within the county to assist with EMS, fire, and police dispatching to oil and gas well sites and other facilities.

### 3.3.2.1.3 Scott County, KS

Historically, Scott County (pop. ~5,000) has relied less heavily on the oil and gas industry than Grant and Haskell counties for its tax and economic base. However, oil drilling and production have grown substantially in recent years, and although this has brought increased demand for some services, revenues—primarily from property taxes—have easily outweighed new costs.

County-wide valuations have grown from roughly $72 million in 2005 to more than $100 million in 2014 (Scott County KS Treasurer's Office 2015), driven in large part newly valuable oil wells on county tax rolls. In 2014, oil and gas accounted for 27 percent of county-wide assessed values (KS Department of Revenue 2015b). This increased valuation has been the primary driver of county revenues increasing from roughly $8.9 million in 2009 to $11.7 million in 2013 (KS Department of Administration 2009-2014). However, local officials expect property tax revenues to fall substantially in 2015 due to lower oil prices.

Two other oil- and gas-driven revenue sources have been beneficial for the county. First, allocations from the state Oil and Gas Depletion Trust Fund have totaled roughly $1 million in recent years though, as in other counties, the revenue has been unpredictable and volatile. Scott County has also received roughly $56,000 for an oil lease on county property and, with drilling slated to begin near the time of our interview, projected a revenue stream of roughly $60,000 per year.

Unlike other Kansas counties, Scott County has not faced major issues with road and bridge damage. However, it has faced substantial costs associated with a dispute over property valuation. Like Haskell County, Scott County recently lost a legal dispute over the methodology for valuing certain oil and gas property and is now obligated to pay a $150,000 settlement to the affected company. Because the revenue was collected over a year ago and the county did not budget for this

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27 Based on interview with Haskell County commissioner Bill Lower, March 18, 2015 in Sublette, Kansas.
expense, it has created planning challenges, though local officials say reserves can cover the expense.\textsuperscript{28} The only other substantial cost associated with new industry activity has been workforce retention. Because of high-paying competition from oil and gas operators, the county raised its starting wages by $1 to $2 per hour for the road and bridge crew, and lost several staff. However, the county has not struggled to fill these positions and the issue has generally been manageable.

3.3.2.2 Municipal-level experience in Hugoton region, KS

3.3.2.2.1 Sublette, KS

Sublette (pop. ~1,400) is the seat of Haskell County and its retail and business hub. The city employs just five full time staff, and total 2014 revenues were just $2.2 million (KS Department of Administration 2009-2014). The oil and gas industry employs a substantial number of people in and around Sublette, and provides a net fiscal benefit to the city.

Sales and property taxes provide the bulk of city revenue, and local officials report that the oil and gas industry supports these revenues by providing an employment base for the community, though precise figures are not available.\textsuperscript{29} In addition, the city has two leases underneath municipal wastewater ponds, which generated roughly $56,000 per year in 2013 and 2014, along with a $7,000 signing bonus in 2012.

Local officials do not report any substantial costs associated with the industry, aside from the basic costs of providing services to residents and visitors working with oil and gas companies. Roads, workforce retention, and other issues experienced by counties in the region have not been a major challenge for the city of Sublette.

3.4 New Mexico

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Major revenue source(s) & Property tax \tabularnewline & Sales tax \tabularnewline \hline
Major cost(s) & Roads \tabularnewline & Workforce retention \tabularnewline \hline
Net fiscal impact & Roughly neutral to large net positive \tabularnewline \hline
\end{tabular}
\caption{New Mexico County Summary}
\end{table}

\textsuperscript{28} Based on interview with Scott County commissioner James Minnix, March 19, 2015 in Scott City, Kansas.
\textsuperscript{29} Based on interview with Sublette mayor Jery Bailey and city clerk Jeannie Trig, March 18, 2015, in Sublette, Kansas.
Table 16. New Mexico Municipality Summary

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<th>Major revenue source(s)</th>
<th>Sales tax</th>
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<td>Major cost(s)</td>
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<td>Net fiscal impact</td>
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<td>Medium net negative to large net positive</td>
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3.4.1 Permian Basin region, NM

The Permian basin straddles west Texas and southeastern New Mexico, and production on the New Mexico side of the border occurs almost exclusively in Eddy and Lea counties (in Newell and Raimi (2014b), we examine the local fiscal effects on the Texas side of the border). The Permian has for decades been one of the United States’ leading oil and gas producing regions, but development of a variety of shale formations in the region since roughly 2010 has driven an enormous increase in production (see Figure 12). In terms of wells drilled per square mile, Eddy and Lea have been among the most heavily drilled counties in the United States over the past decade (see Appendix Table A3).

Figure 12: New Mexico Permian Basin oil production

 Counts in New Mexico collect a variety of revenues directly and indirectly from oil and gas development. They apply their ad valorem property taxes to the value of oil and gas production and equipment; collect gross receipts taxes (similar to sales taxes, but levied on the value of both goods and services) directly from the sale of oil- and gas-related goods and services, as well as indirectly from purchases made by the oil and gas workforce; and receive property taxes on non-oil and gas...
property supported by the industry workforce. The counties have also faced increased demand for services tied to the industry including roads, law enforcement, emergency services, and more.

### 3.4.1.1 Eddy County, NM

Eddy County (pop. ~55,000) relies heavily on the oil and gas sector for public revenue, and local officials report that it’s hard to say whether increased drilling and production has led to a net fiscal benefit for the county. Revenue has grown strongly in recent years led by oil and gas property taxes, which grew from $12.5 million in 2006 (30 percent of total revenues) to $22 million in 2013 (35 percent) (New Mexico Office of the State Auditor 2006-2013). In 2013, oil and gas property accounted for 61 percent of county-wide valuation (New Mexico Dept. of Finance and Administration 2014). Total revenues increased from $38 million in 2006 to $62 million in 2013, thanks to fast-rising gross receipts taxes and non-oil and gas property taxes. At the time of our visit in January 2015, the county had roughly $100 million in reserve funds.

This revenue growth might indicate that the net fiscal impacts have been positive, but costs have been very large, and a variety of demands have gone unmet. As an indicator of this challenge, the county’s net unrestricted assets have remained essentially unchanged since 2006 at roughly $24 million (New Mexico Office of the State Auditor 2006-2013).

The leading challenge for Eddy County has been industry-related road damage, to the point that school buses are unable to use certain roads. The county maintains 1,400 miles of road and does not have road maintenance agreements with operators. In-kind donations have been negligible, though there was one exception of a of $1.5 million donation from three companies to quickly repair a road damaged by flooding. Local officials estimate that roughly $400 million would be needed over two years to make all necessary short-term repairs caused by industry-related damage. While the county does not have this money, it is planning a $300 million relief route for a highway that would relieve traffic on some of the county’s main roads.

Other costs have been substantial as well. Law enforcement and judicial/jail demand has grown substantially to accommodate increased population and traffic concerns, and roughly 25 law enforcement staff have been added in the past five years, an increase of over 50 percent. The county built a new sheriff’s building for $7 million and a new records building for $1.5 million, and now needs a new general administration building, which will likely cost about $10 million. Finally, workforce retention has been a major challenge due to high wages in the oil and gas sector and high housing prices in the region.

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30 Based on interview with Eddy County general services director Bill Morris, Jan. 5, 2015, in Carlsbad, NM.
3.4.1.2 Lea County, NM

Lea County’s population has grown by roughly 13 percent since 2010 (2014 pop. ~68,000), primarily due to increased oil and gas development and, unlike its neighbor to the west, county finances have benefited heavily from increased drilling and production. Lea County has for most of the decade taken in more oil and gas property tax revenue than Eddy County, but these revenues have grown more modestly, rising from $21 million in 2006 (43 percent of total revenues) to $23 million in 2013 (36 percent). Other sources, however, have led total revenue to nearly double over the same period, led by charges for services, non-oil and gas property tax receipts, and gross receipts taxes (New Mexico Office of the State Auditor 2006-2013).

Local officials attribute most of this increased revenue to oil and gas activity in the Permian basin, though a large uranium enrichment facility located within the county has also helped. Revenue growth has contributed to a rapid increase in the county’s unrestricted net assets, which grew from $37 million in 2006 to nearly $76 million in 2013, roughly 1.5 times greater than total expenditures in the same year. These funds have enabled the county to make a variety of capital upgrades, including a new 911 dispatch center, a new sheriff’s office, and renovations to existing office space, all of which were paid for with cash. At the close of FY 2014, the county held $108 million in the bank.31

Although net fiscal impacts have been positive, Lea County has large expenses and a variety of service demands attributable to increased oil and gas development. Perhaps the leading cost is roads, which are heavily impacted by oil and gas traffic, and cost roughly $11 million in FY 2014. However, local officials report that the roads are generally in good condition and that the county has sufficient funds make all the needed repairs. Law enforcement and EMS costs and staffing have also grown, including the addition of several new sheriff’s deputies and several new 911 dispatchers. However, these costs have grown in line with population, and the costs have been manageable.

Workforce retention has been a challenge for the county, though employees received annual 5 percent raises in recent years, and the county has increased other compensation such as benefits.

3.4.1.2 Municipal-level experience in Permian basin region, NM

We visited three of the largest cities in New Mexico’s Permian basin, and the net fiscal effects for these municipalities varied substantially. The region is very rural, meaning that population growth from oil and gas activity has concentrated heavily in these three cities. Each has experienced rapid growth, and all three note that this growth has been extremely positive for the local economy. However, the effects on city finances have not been uniformly positive. Unlike counties in New Mexico, which see substantial revenues from oil and gas property taxes, municipalities generally do

31 Based on interview with Lea County administrator Mike Gallagher, Feb. 6, 2015, over telephone.
not collect any revenue directly from oil and gas production or property. Instead, they tend to rely on indirect sources such as gross receipts taxes driven by economic activity and industry-led population growth.

3.4.1.2.1 Carlsbad, NM

Carlsbad is the second largest city in southeastern New Mexico, with a census-estimated population of roughly 28,000. According to census estimates, population has grown little in the past several years. However, local officials report that since 2010, the year of the last detailed census, population has grown to roughly 44,000 with an additional 8,000 people living on the outskirts of the city.32 This growth has led to substantial new revenues for the city, but even more substantial costs. As a result, the local economy is thriving, but the city government does not have all the funds it needs to expand services accordingly.

Gross receipts taxes are the leading revenue source for Carlsbad, and these revenues have more than doubled in recent years, growing from $19 million in 2007 (39 percent of total revenues) to $40 million in 2013 (53 percent). Hotel tax revenues have also roughly doubled to $1.6 million in 2013, and property tax revenues have grown with new construction, although they account for a small share of total revenues. Carlsbad’s unrestricted net assets grew over this period from $28 million to $55 million (New Mexico Office of the State Auditor 2006-2013).

Despite this rapid growth in revenue, the city has not been able to keep up with all demands for services. The leading issue has been impacts to roads from heavy industry truck traffic. Local officials estimate that the city needs roughly $20 million for roads, $10 million for a new bridge, and millions more to hire additional staff and contractors. For context, 2013 spending on public works, which includes roads, was $7.4 million. Heavy demand for contractor services from the oil and gas industry has driven costs for labor and materials much higher, making it more difficult for the city to afford these additional services.

Along with roads, costs for law enforcement have increased with the addition of several new officers and substantial overtime. Local officials attribute this increased demand to oil- and gas-driven population growth. Workforce retention has also been a major challenge, as the city had six to eight law enforcement positions unfilled at the time of our interview. Housing costs have been driven up by the growing population, which has made recruiting new staff more difficult, and a number of staff have moved to work in the oil and gas sector, creating more unfilled positions. Finally, local officials note that opportunity costs have been very large. Time previously spent on

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32 Based on interview with Carlsbad city administrator Steve McCutcheon, Jan. 5, 2015, in Carlsbad, NM.
“day-to-day” issues has increasingly been devoted to planning and zoning work, which has been necessary to accommodate the rapid population growth driven by oil and gas activity.

3.4.1.2.2 Hobbs, NM

The fiscal effects of increased oil and gas development in Hobbs (pop. ~36,000), which lies just across the Texas border in Lea County, has been “fantastic” according to local officials, with the city’s cash reserve fund growing to more than $100 million. Increased revenue, primarily from gross receipts taxes, has enabled the city to make a variety of capital upgrades. Gross receipts tax revenues have grown from roughly $22 million in 2007 to $73 million in 2013, accounting for nearly 70 percent of total city revenues (New Mexico Office of the State Auditor 2006-2013). Hotel and property tax revenues have also grown substantially, but these make up a relatively small share of the city’s annual budget. In addition, the city has received one $300,000 donation from a local oilfield operator for municipal recreation projects.

Costs and service demands have also grown substantially, led by staff costs. The city has added 30 new police officers and 15 new firefighters to manage population growth and increased demand for services, and total staffing has grown from about 430 employees in 2008 to roughly 530 in early 2015. Hobbs constructed a new $5 million fire building to accommodate this industry-driven growth. Workforce retention has also been a challenge for the city, which is now spending an additional $6 million per year on incentive packages to attract new employees and to help retain existing staff.

City spending has grown substantially in the wake of increased industry activity, but local officials describe these projects as being enabled by oil and gas revenues rather than being required due to increased service demands. Projects over the past several years include a long-needed $11 million upgrade to the city sewer system, $19 million in road improvements, $19 million for new and expanded recreation facilities, and $1 million for a new transportation center. Each of these projects was paid for with cash, which would not have been possible without increased oil- and gas-driven revenues. The city hopes that these upgrades will improve residents’ quality of life, attract a more diverse range of businesses and establish a more diversified economic foundation for years when oil and gas activity slows.

3.4.1.2.3 Lovington, NM

Lovington (pop. ~12,000) is the seat of Lea County, but due to its smaller size and commercial base, it has seen less additional revenue than Hobbs. However, increased revenues have

33 Based on interview with Hobbs mayor Sam Cobb and finance director Toby Spears, Jan. 6, 2015, in Hobbs, NM.
easily outweighed increased demand for services and direct costs. Gross receipts taxes are the leading revenue source for the city, and grew from $5.8 million in 2008 to $8.4 million in 2013 (New Mexico Office of the State Auditor 2006-2013). As for other cities in the region, hotel and property taxes have grown, but account for a small share of total city revenues. Lovingtn also owns a wastewater injection well, which in recent years has generated $15,000 to $20,000 per month, a helpful new revenue source.

Costs and demand for services have also increased. The city has an ordinance preventing heavy trucks from using residential streets, and most thoroughfares running through the city are maintained by the state. However, one road has been heavily affected by increased oil and gas traffic, and repair costs are estimated at $2.5 million. The city has also added several new staff for firefighting and EMS, where call volumes have grown substantially, mostly due to oil and gas vehicle traffic accidents. This increased demand has led the city to begin constructing a new $1.3 million EMS center. Staff costs and workforce retention challenges have also been substantial, particularly in the streets and wastewater departments. The city has had to raise its hourly rate to $12 per hour, well above previous levels, to compete with the oil and gas sector and local retailers such as Wal-Mart, which pays even higher starting wages. In addition, costs for contractors working on city streets or other infrastructure have grown by an estimated 25 percent to 30 percent due to increased demand from the oil and gas sector.

Other new costs have been enabled by additional revenues, rather than required by new demands. For example, the city had long needed a financial director, and one was hired in recent years due to newly available funds.34

### 3.4.2 San Juan basin region, NM

New Mexico’s San Juan basin, which sits in the far northwest corner of the state, has seen substantial increases and decreases in oil and gas development over the past 15 years. During the 1990s and 2000s, thousands of coalbed methane wells were drilled in the region, producing large quantities of natural gas and relatively little oil. But as new technologies for extracting natural gas from shale formations became more economical, companies began moving away from the San Juan basin’s coalbed methane in favor of shale and other tight gas plays in Colorado, Wyoming, Texas, and beyond. As a result, the number of new wells drilled in the region fell dramatically along with population.

In recent years, drilling rigs have moved to target oil from the region’s Mancos shale formation, leading to an increase in local oil production (see Figure 13). However, other regions

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34 Based on interview with Lovingtn assistant city manager Jared Cobb, Jan. 5, 2015, in Lovingtn, NM.
have seen far more activity in the shale era, and during our visit in early 2015, only four drilling rigs were active in the region, down from dozens in the 1990s and 2000s. Despite this decrease in new drilling activity, the thousands of existing wells support dozens of oilfield service firms, and overall industry activity has remained strong.

**Figure 13: Natural gas and oil production in San Juan County, NM**

![Graph showing natural gas and oil production in San Juan County, NM](image)


### 3.4.2.1 County-level experience in San Juan basin region, NM

#### San Juan County, NM

San Juan County (pop. ~127,000) grew steadily from 1990 through 2010, when its population levelled off and declined slightly as drilling activity in the region slowed. However, oil and gas continue to play a dominant role in the county’s economy, and the fiscal impacts of the industry were very positive for the county government for decades. However, declining industry investment has meant falling county revenues in recent years, and these decreases are likely to continue. Local officials are eager to diversify their economic base, though they note that this will be a challenge given the rural nature of the region and its limited transportation connections.\(^{35}\)

Local officials say virtually all revenues are tied directly or indirectly to oil and gas activity, and these revenues fluctuate alongside industry activity in the basin. Oil and gas property taxes have for decades generated a substantial share of county revenues, rising as high as 16 percent of total

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\(^{35}\) Based on interview with San Juan County executive officer Kim Carpenter, January 8, 2015, in Farmington, NM.
revenues in 2007, but declining to just 6 percent in 2013 (New Mexico Office of the State Auditor 2006-2013). The county’s gross receipts tax has also tracked the decline in oil and gas activity, falling from a peak of $42 million in 2008 to $35 million in 2013. This decline would have been even steeper had the county not increased its tax rate by slightly less than ½%, and local officials state that they would have had to cut services substantially without this additional revenue.

The only major revenue source with a positive trend line is property taxes on non-oil and gas property, which has grown from $17 million in 2007 to $23 million in 2013 thanks to increased commercial and residential property values. Another important factor for the county is in-kind contributions from oil and gas companies, which help to repair roads around roughly half of the new wells that are drilled. These contributions mostly occur in rural regions where oil and gas companies are the primary users of the road. In addition, a variety of operators came together to contribute $2.3 million to repair a deteriorating bridge that was heavily used in their operations.

Despite these contributions, road and bridge damages are a challenge and easily the leading cost for San Juan County. The county seeks a variety of grants from state and federal sources to try to improve road conditions, but New Mexico does not allocate grants based on oil- and gas-related impacts. As with revenues, most costs and service demands for the county are indirectly driven by the oil- and gas-industry workforce.

Along with road costs, other direct impacts include law enforcement demands, which are substantial in the oil- and gas-producing areas primarily due to thefts from well sites. Fire and EMS have not been large direct costs, and the county only employs 14 full-time staff in these departments. However, the county struggles to retain a sufficient number of volunteers (270 volunteers currently staff the fire and EMS crews), especially during periods of heavy drilling activity. In a similar vein, workforce retention has been a challenge during the most active phases, particularly in law enforcement, and compensation has grown as a result. Despite a relatively low cost of living, San Juan County pays an average of 7 percent more for law enforcement officials than similarly rural counties in New Mexico, and the sheriff’s office offers substantial signing bonuses to attract and retain employees.

Looking forward, the county is facing fiscal challenges due to reduced oil and gas activity. In FY 2013, it spent roughly $4 million more than it collected, a departure from years of surplus.

3.4.2.2 Municipal-level experience in San Juan basin region, NM

Like those in New Mexico’s Permian basin, cities in the San Juan basin rely heavily on gross receipts taxes, with additional revenues from property taxes and other sources such as hotel taxes and fees for utility services. These sources are indirectly tied to oil and gas activity, driven by economic and population growth in the region. The oil and gas sector is the largest employer and
economic engine of the region, and cycles in drilling activity tend to correlate with cycles in public revenues and demand for services. As noted in Section 3.4.1.2, municipalities in New Mexico do not receive substantial direct revenue from oil and gas property taxes or allocations from the state’s severance tax.

### 3.4.2.2.1 Farmington, NM

Farmington is the San Juan basin’s largest city and commercial hub, with a population growing from roughly 40,000 in 2000 to roughly 45,000 in 2014. Oil and gas activity has been the primary driver of the city’s economy and, in this sense, it has been unquestionably good for the city government’s finances. However, recent declines in drilling activity have created challenges for Farmington, and a long-term downturn in drilling activity may create substantial challenges for the local economy. Although Farmington’s efforts at economic diversification have been hampered somewhat by limited transportation connections and a high cost of doing business, it benefits by being the regional hub for the “4-corners” region, generating substantial revenues from gross receipts taxes on retail and service transactions.36

Gross receipts taxes are the leading revenue source and are highly correlated with oil and gas activity, peaking in 2008 at over $54 million and falling to $48 million in 2013 (New Mexico Office of the State Auditor 2006-2013). Although they are not a major city income source, property tax revenues have been stable over the past five to 10 years, thanks largely to high regional home values. During the housing market crash of 2008 and 2009, local home values remained stable, which local officials attribute to a strong oil and gas sector during that period.

The city faces a variety of service demands, all of which are indirectly affected by the oil and gas industry workforce living in and around the city. However, there is little to no production within city limits, which helps limit heavy vehicle traffic and acute road damage. According to local officials, streets are in need of repair and the sewer and water system needs continuous investment, but the city has not faced acute demands from oil- and gas-driven population growth. Instead, the types of challenges faced by Farmington are similar to those of any mid-size city with aging infrastructure. One direct effect of oil and gas development is difficulty in workforce retention, particularly during the heavy drilling years of 2008 and 2009. However, that has eased with the industry slowdown.

36 Based on interview with Farmington city manager Robert Mayes, Jan. 9, 2015, in Farmington, NM.
3.4.2.2  Aztec, NM

Aztec is a city of roughly 6,600 lying just a few miles northeast of Farmington in San Juan County. Local officials report that oil and gas activity is a net positive for the city’s finances, even during industry downturns.\(^{37}\) Like other cities in New Mexico, gross receipts taxes provide the bulk of operating revenues, and they have historically tracked oil and gas drilling activity. However, these revenues have remained surprisingly strong during the most recent downturn, hovering near $5 million in 2013, up from roughly $4 million in 2010. All other revenue sources for the city are relatively small, such as property taxes, hotel taxes, and franchise taxes (for cable television and telephone connections). The city has been supported by strong revenue in recent years from its electric utility, which serves a number of oil and gas firms.

The leading oil- and gas-related cost for Aztec has been sewer and water systems, which have needed rapid expansion due to population growth driven by the oil and gas workforce. Local officials say a recent $4.2 million upgrade to the water treatment plant was due entirely to oil and gas-driven growth and a $13 million rebuild to the city’s sewer plant was mostly due to industry growth, while a $5 million upgrade to sewer lines occurred more quickly than it would have without industry-led population growth. Cost for roads are also substantial, with local officials estimating that $1.2 million in additional repairs each year are necessary due to oil and gas heavy vehicle traffic. For context, total roads spending in 2013 was $1.9 million (New Mexico Office of the State Auditor 2006-2013). Other costs, such as the police department, are affected indirectly by the oil- and gas-based workforce, and these service demands are manageable. Workforce retention, however, is a substantial challenge, particularly for the police force and utilities departments.

3.5  Ohio

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\(^{37}\) Based on interview with Aztec city manager Joshua Ray, Jan. 9, 2015, in Aztec, NM.
Eastern Ohio has produced natural gas and oil for decades, but recent years have seen a dramatic increase in production due to the Utica Shale, which lies up to 3,000 feet beneath the Marcellus formation. In the early years of Utica development, Carroll County saw the most activity, and in recent years, rigs have moved south to counties including Harrison, Monroe, and Noble (see Figure 14). In the early 2010s, as activity in parts of the Marcellus shale declined due to falling dry natural gas prices, Utica activity increased due to the higher content of natural gas liquids produced from the formation. In 2013, Carroll County was one of the most densely drilled counties in our survey, with more than 37 new wells entering production for every 100 square miles of county area (see Table A3).

**Figure 14: Natural gas production from select Utica shale counties**

Data source: Ohio Department of Natural Resources, Division of Oil and Gas Resources (2015). Includes natural gas production from all formations, including Utica and Marcellus shales.

As of this writing, the state of Ohio levies a severance tax of $0.10 per barrel of oil and $0.025 per thousand cubic feet (mcf) of natural gas, along with an oil and gas cost recovery assessment which adds an additional $0.10 per barrel and $0.005 per mcf. These revenues are used primarily to fund remediation activities at well sites and to mitigate potential health hazards associated with oil and gas activity (Ohio Revised Code 2015). These two sources raised roughly $4.6
million in FY 2013, and none of that revenue was allocated to local governments (Ohio Department of Taxation 2013). In recent years, several attempts have been made to adjust the state’s severance tax (Ernst & Young LLP 2012), but no legislation has passed and been signed by the governor.

Ohio local governments apply their ad-valorem property tax levies to the value of oil and gas property within their borders. County governments also raise revenue from sales taxes, while cities and villages raise revenue from income taxes. Townships, another form of municipality which subdivide counties, raise revenue primarily from property taxes and use those revenues to maintain the rural road networks across the state.

### 3.5.1.1 County-level experience in Utica shale region, OH

County governments in Ohio provide a range of services including road construction and maintenance, public safety, human services, property records, and more. Utica shale development has affected several of these services substantially, but increased revenues from sales taxes, property taxes, and other sources have generally provided more than enough to manage these increased demand for services. Notably, one county commissioner from Belmont County has testified to state officials that their county has not been able to keep pace with demand for services (Favede 2014). We were not able to arrange an interview with this commissioner or other local officials in Belmont County.

#### 3.5.1.1.1 Carroll County, OH

The economy of Carroll County (pop. ~28,000) has historically been based on dairy production and other agricultural activities. It was the first county to experience large-scale Utica shale development, beginning around 2011 and 2012. Overall, local public finances have benefited substantially from this development, exemplified by the county’s level of unrestricted net assets. From 2002 through 2011, unrestricted net assets were well below zero, ranging from -$2.1 million in 2002 to a depth of -$4.1 million in 2009. In 2010 and 2011, however, assets began to grow rapidly, leading to a positive balance of $1.8 million in 2013. Total net assets, which include all assets and liabilities, grew from $17.9 million to $56.5 million over the same period (Ohio State Auditor's Office 2000-2013a).

The leading revenue source associated with this increased activity has been sales taxes, which grew from $1.8 million in 2010 to $3.8 million in 2014.\(^{38}\) Local officials attribute most of this increase to increased economic activity associated with the oil and gas workforce. Property tax

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\(^{38}\) 2014 data and other information based on budget documents examined during interview with Carroll County Commissioner Jeffrey Ohler, April 7, 2015, in Carrollton, OH.
revenues have also grown in recent years, but these revenues have been modest since most property tax revenues go to townships and school districts.

In addition, the county signed a lease for shale production on roughly 300 acres, collecting a $1.2 million bonus. Production recently began on this lease and, at the time of our interview, was generating roughly $40,000 per month in royalties, though these revenues will decline without new wells coming on line. County officials have sought to avoid using this windfall for ongoing operating expenses, and have instead invested in capital upgrades as well as a “rainy-day fund,” which the county had not previously had.

As in other parts of the country with rapidly expanding shale development, Carroll County roads have been heavily affected by industry vehicle traffic. However, these damages have not resulted in large expenses, as the county requires all operators to sign a Road Use and Maintenance Agreement (RUMA), stipulating that any damages to roads must be repaired and paid for by the relevant company. Carroll County officials estimate that RUMAs have resulted in roughly $40 million of investment in county and township roads, leading to an improvement in road conditions.

Other large costs have been led by law enforcement, which has seen a budget increase of $400,000 to $500,000 in recent years, largely due to increased vehicle traffic and crimes. Local officials attribute most of this increase to oil and gas vehicles and the oil and gas workforce. Emergency services have also seen increased demand associated with industry-related accidents and fires, though these costs (roughly $20,000 in FY 2014) have been covered by the relevant companies.

3.5.1.1.2 Harrison County, OH

Since roughly 1980, population in Harrison County has been slowly but steadily decreasing as businesses and coal mines shut their doors. Today, the county’s population is roughly 16,000, and Marcellus shale activity has boosted economic activity and county finances. However, local officials are concerned about potential future environmental impacts as well as the potential for shale development to constrain future construction opportunities.

Sales tax and property tax revenues have both increased very significantly, with sales taxes more than doubling and assessed property values growing by more than $500 million due to the several new natural gas compressor stations within the county. From 2011 to 2013, the most recent year for which audited data were available, total sales and property tax revenues grew from $3.7 million to $7.3 million (Ohio State Auditor's Office 2000-2013b), and have grown further in subsequent years. Other major revenue sources for the county include a lease signed for 1,000 acres, which generated roughly $5 million in bonus payments and for which it will receive an 18

39 Based on interview with Harrison County commissioners Don Bethel and Dale Norris, April 7, 2015, in Cadiz, OH.
percent to 20 percent royalty share if and when production begins. Roughly $2 million has been generated by fees associated with pipelines crossing county property.

Along with these revenues, the county has experienced a variety of large new costs associated with Marcellus development. Despite signing RUMAs with oil and gas companies operating in the area, local officials report that they have not been able to adequately maintain roads in the face of industry-related damage, and that road conditions are worse today than they were prior to major drilling activity. Local officials estimate they will need to invest an additional $1 million in road repairs this fiscal year, an unprecedented increase. It is not clear why the RUMAs, which appear to have prevented major outlays in other counties and townships, have not been as effective in Harrison County.

Other costs for the county have grown, driven by population growth from the oil and gas workforce. An estimated eight to 10 new staff have been added to the sheriff’s department. The human services department, primarily child and family services, have needed to increase spending by $300,000 per year. In addition, workforce retention has been a challenge, and the county has raised its wages roughly 25 percent to try to attract and retain staff.

Local officials also have some long-term concerns related to shale development. Decades of coal mining in Harrison County have left substantial legacy environmental issues, and officials are concerned about the long-term environmental impacts of shale development. In addition, the extensive new network of pipelines underlying the county has the potential to increase the cost of future development, potentially limiting economic growth in the coming decades.

Despite these challenges and concerns, local officials report that the overall fiscal impact has been very positive for Harrison County. Perhaps the most telling indicator is the county’s fund balance, which ended 2010 as low as $278,000, when it was unclear whether the county would be able to make its payroll each month. At the beginning of 2015, the fund balance reached $10.8 million, growth which local officials attribute entirely to Utica shale development.

### Monroe County, OH

A large number of shallow, vertical natural gas wells have been drilled in Monroe County (pop. ~14,600) in previous decades, but the horizontal drilling in the Utica shale has brought a new scale of activity. Monroe County is known as the “Switzerland of Ohio” because of its rolling hills and numerous covered bridges. However, population has been falling steadily since roughly 1980 as manufacturing and coal mining jobs have left the area. Utica shale development has generally been positive for local government finances. Like Harrison County, the county government had often struggled to make its payroll in previous years, but is now on stable fiscal footing.
Sales tax revenues have been the leading new income source for the county, growing from roughly $1.5 million in 2010 to $2.2 million in 2013 (Ohio State Auditor's Office 2003-2013a). Sales tax revenues in 2015 have averaged roughly $300,000 per month, on track to reach $3.6 million for the year.\(^\text{40}\) Property tax revenues have also increased modestly due to new construction of natural gas pipelines, though these revenues mostly benefit school districts and townships. The county also signed a lease bringing in roughly $500,000, though no production has yet occurred. Finally, revenues for the county recorder’s office have grown rapidly as oil and gas “landmen” looking to acquire leases pay for copies of county records. In addition, one company paid to digitize the county’s entire catalog of land records, a costly improvement that the county would otherwise not have been able to afford.

RUMAs are common in Monroe County and, while road damage has been substantial during the most active phases of drilling, the overall conditions of the roads are better than they were before Utica shale development. The county engineer estimates that the pace of road paving increased by eight to 10 times due to these agreements and, although materials costs are higher due to increased demand from oil and gas operators, the net effects on county roads has been largely positive. However, there have also been challenges. For example, one road was closed for roughly three weeks due to a well pad accident and fire. There have also been increased road closures in areas where companies move large equipment, detours, and other inconveniences for local residents.

Demands for law enforcement and emergency services have also increased substantially. A variety of incidents, including large truck accidents, well pad fires, and other industry-related incidents have increased the number of runs for the volunteer emergency medical service from one or two per month to five or six. Prisoner housing costs are also up, which local officials attribute largely to drug-related issues from the oil and gas workforce (while most oil and gas companies conduct rigorous drug tests on employees, ancillary employers or subcontractors may not).

A variety of staff costs have also affected the county, led by the addition of two full-time law enforcement staff, one administrative staff, and six to eight part-time staff in the recorder’s office. Workforce retention has been a challenge, especially for the sheriff’s office, and county commissioners note that there have been opportunity costs associated with the large amount of time they now spend on oil- and gas-related issues. However, the revenues described above have to date outweighed these increased costs and demand for services.

\(^\text{40}\) Based on interview with Monroe County Commissioners Carl Davis and Mick Schumacher; county auditor Pandora J. Neuhart; and county commission secretary Sheila Turner on April 6, 2015, in Woodsfield, OH.
3.5.1.2 Municipal-level experience in Utica shale region, OH

3.5.1.2.1 Cadiz, OH

The village of Cadiz (pop. ~3,300, pronounced CAT-iss) is the county seat of Harrison County, and has been faced with a number of financial challenges in recent years. However, most of these challenges are not related to Utica shale development, which has by and large improved the village’s fiscal position. Cadiz relies heavily on a municipal income taxes and, as local economic conditions declined, this revenue fell by more than 25 percent between 2005 and 2010 (Ohio State Auditor's Office 2005-2012). However, income tax revenues have roughly doubled since that time, growing from $610,000 in 2010 to $1.2 million in 2014.41

Other major revenue sources include the sale of municipally owned land to a natural gas processing firm, netting roughly $1.1 million in one-time revenues. The village has also benefited from a lease worth roughly $560,000 in bonus revenues and will receive royalties of 20 percent if and when production begins, along with roughly $550,000 in revenues for pipeline easements across village property. Indirectly, the village will also benefit from new property tax revenues expected to be generated by several new businesses and health care facilities opening in the near future. Local officials attribute this economic growth in part to Utica shale development.

Along with these new revenues, Cadiz faces substantial costs. One long-running fiscal challenge is related to the village’s water and wastewater systems, which require an estimated $10 million in upgrades. Local officials do not attribute most of these needs to oil and gas activity, though they note that increased community and population growth related to Utica shale development has contributed. Road and bridge damage has been substantial, and the village has at times struggled to repair industry-related damage and deterioration. RUMAs with two pipeline companies have been helpful, but not sufficient to manage the increased needs to date.

In addition, increased demand for law enforcement and judicial services, led by traffic incidents and DUIs, is attributed by officials to the Utica shale workforce. While fines and court fees help offset the costs of these services, the increased demand has been a challenge for local law enforcement. The village has added one new police officer, a part-time consultant to manage planning issues and growth, and a new employee in public works. These new staff have largely been dedicated to working on issues related to oil- and gas-driven economic and population growth, and other village staff note the opportunity costs of spending large amounts of time on oil- and gas-related issues.

41 Based on data provided during interview with Cadiz mayor Ken Zitko and economic development consultant Charley Bowman, April 7, 2015, in Cadiz, OH.
3.5.1.2.2 Lee Township, OH

Lee Township (pop. ~1,100) covers just 32 square miles, but there are more than 20 well pads within its borders, each containing multiple horizontal wells. The township’s primary duty is to maintain rural, mostly unpaved roads, and the influx of heavy vehicles has at times been a challenge. However, due to the use of RUMAs, township roads are generally in better condition than they were before drilling began, and roughly 60 percent of township roads have been completely rebuilt at an estimated cost to industry of over $3 million.\(^\text{42}\) Property taxes provide most revenues for the township, and they have grown from roughly $60,000 per year to about $90,000 this year, attributable mostly to oil and gas property. In addition, the township has received roughly $40,000 for leasing its cemetery, and operators make occasional donations of road materials to help township officials make additional repairs to roads not covered by RUMAs.

These donations were described as “peace payments” by local officials, as trucks have occasionally veered away from their designated haul routes and damaged township roads. To compensate for these damages, operators donate materials to the township, which local officials describe as a fair system. While the donations have been helpful, township trustees (who do most of the work maintaining roads) have needed to work longer hours to keep up with increased demand for repair and increased traffic on the roads.

Overall, local officials report that Utica shale development has been positive for the township’s finances and its road conditions, but they also note that the increased traffic and road damage has been a challenge at times.

3.5.1.2.3 St. Clairsville, OH

The city of St. Clairsville (pop. ~5,100) is the seat of Belmont County, where substantial shale development has occurred. However, the city has seen limited fiscal effects from the oil and gas development occurring around the county. Overall, local officials report the net fiscal effects have been slightly positive, but that the impact has been small.

The only major revenue source associated with oil and gas activity for the city has been a lease netting $1.5 million for scattered municipal property holdings below the city’s sewer and water facilities and its reservoir. The city does not levy a sales tax, but it does collect an income tax of 0.75 percent, which has grown from $1.0 million in 2012 to $1.3 million in 2013 (Ohio state Auditor’s Office 2003-2013b) (the tax was authorized in 2011). Revenues have grown further in FY 2014 due to an oilfield service firm locating within city borders, though precise figures were not available.

\(^\text{42}\) Based on interview with Lee Township trustee James Fisher and fiscal officer Cathy Kinney, April 7, 2015, in Carrollton, OH.
The leading costs for the city are associated with workforce retention and law enforcement. Two or three city employees out of a total of 17 left to work for oil and gas companies or contractors, and law enforcement needs have increased due to an uptick in traffic incidents, fights in bars, and domestic violence. Local officials attribute the increase primarily to the oil and gas workforce, but note that it has been generally manageable with existing staff and resources. There has also been a substantial increase in heavy vehicle traffic through the city and wear and tear on local roads, but costs to date have not been large.43

3.6 Oklahoma

Oklahoma has long been one of the nation’s leading oil and natural gas producers, and production across the state has increased substantially in recent years. This increased production has come from a variety of regions, with some activity focused on shale formations and some focused on applying new techniques to more conventional formations. We examined three regions that have experienced substantial growth in drilling and production: the Anadarko basin in the west, the Mississippian Lime region in the north, and the Woodford shale region in the southeast. As we discuss below, variations in geology, infrastructure, and local government capacity have meant that increased oil and gas activity has affected local governments in these regions in different ways.

Local governments in Oklahoma collect property taxes on oil and gas property, including the value of reserves. Some surface property such as refineries, processing plants, compressor stations, and gathering lines are also taxed, but materials such as wellbores, casing, and wellheads are not. Most property tax revenue flows to school districts, with a smaller share to counties and a still smaller share to municipalities. One challenge for Oklahoma counties is that revenue from property taxes are not available to fund road projects or repair. Instead, counties must rely on other sources that are explicitly dedicated to fund roads, and their flexibility to reallocate funds is limited.

One major source of road funding for county governments comes from Oklahoma’s Gross Production Tax, which raised a total of $703 million in 2013 (OK Tax Commission 2013). A share of these revenues are allocated to county road and bridge funds according to a complex formula, with total allocations amounting to roughly $0.50 per $100 worth of oil and natural gas produced within county borders. Most of the remaining revenue flows to state general funds and various funds for education (for details, see OK Statutes §68-1001 and §68-1004).

43 Based on interview with St. Clairsville Finance Officer Cindi Henry, April 6, 2015, in St. Clairsville, OH.
Table 19. Oklahoma County Summary

<table>
<thead>
<tr>
<th>Major revenue source(s)</th>
<th>Severance tax</th>
<th>Sales tax</th>
<th>Property tax</th>
</tr>
</thead>
<tbody>
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<td>Major cost(s)</td>
<td>Roads</td>
<td>Workforce retention</td>
<td>Law enforcement/EMS</td>
</tr>
<tr>
<td>Net fiscal impact</td>
<td>Medium net negative to large net positive</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 20. Oklahoma Municipality Summary

<table>
<thead>
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<th>Major revenue source(s)</th>
<th>Sales tax</th>
<th>Lease revenues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major cost(s)</td>
<td>Workforce retention</td>
<td></td>
</tr>
<tr>
<td>Net fiscal impact</td>
<td>Medium to large net positive</td>
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</tbody>
</table>

3.6.1 Anadarko basin, OK

Ellis and Roger Mills counties are neighbors at the edge of western Oklahoma, just across the border from Texas’ panhandle. These two counties have seen more than 1,000 well completions each since 2005 (DI Desktop 2015). Production in these two counties comes from a variety of formations, led by the Atoka, Cherokee, Cleveland, Des Moines, Marmaton, Morrow, and Tonkawa formations. Drilling activity began to surge in the mid-2000s, first in Ellis County, followed by Roger Mills. Since 2010, oil production has increased roughly fivefold (see Figure 15). Aside from Alaska, these counties are more sparsely populated than any region we examine in this report, and the fiscal effects on local governments in the area have been substantial.

Figure 15: Oil production in select OK Anadarko basin counties

![Graph showing oil production in Ellis and Roger Mills counties]

Data source: DI Desktop
3.6.1.1 County-level experience in Anadarko basin, OK

Growth in oil production has been dramatic in Ellis and Roger Mills counties in recent years, but the fiscal effects for these counties have been somewhat different. While both have seen large increases in revenue and heavy vehicle traffic, decades of natural gas production in Roger Mills County had helped establish a strong infrastructure base prior to the oil boom. In Ellis County, where infrastructure was not as robust, the surge in vehicle traffic has had more dramatic consequences, and been more difficult for local officials to manage.

3.6.1.1.1 Ellis County, OK

Ellis County (pop. ~4,200) has seen substantial growth in revenues, but damage to the county’s rural roads have been substantial and revenues have not been sufficient to keep up with repair needs. Of its 1,427 miles of roads, just 23 percent are paved (OK Department of Transportation 2015). Because of the heavy volume of truck traffic in the region, local officials report that even newly repaired roads are quickly in need of additional upgrades.

Total revenues for Ellis County’s general fund and highway fund have grown from roughly $4 million in 2003 to more than $16 million in 2013 (OK State Auditor and Inspector 2003-2013). Allocations of the state’s severance tax have been the leading source of revenue growth in recent years. Property tax revenue has also grown as oil and gas property has appreciated county-wide, though most property tax revenue is collected by school districts rather than counties. In Ellis County, oil and gas property accounted for roughly 52 percent of total assessed value in 2013. Including additional industry property such as refineries, gas plants, gathering lines, and compressor stations, that share rises to 91 percent (OK Tax Commission 2014). Sales taxes and leasing revenue have also contributed to revenue growth, but these sources are small according to local officials. Finally, one operator made “one or two” in-kind donations of rock for road resurfacing, which was helpful but not nearly sufficient to manage increased costs.

As noted above, road costs have been the leading concern in Ellis County. Spending on roads has grown from roughly $3 million in 2003 to $5.5 million in 2013 (OK State Auditor and Inspector 2003-2013), but has been insufficient to keep the roads in satisfactory condition. In addition, costs for police and EMS have grown substantially due to oil- and gas-related vehicle traffic and accidents. For example, our interview was conducted at 1 p.m., by which time the county had already received two EMS calls for oilfield-related traffic accidents that day. Local officials stated that this was typical, and a large increase over demand for services in pre-boom years.

44 Based on interview with Ellis County commission secretary Mary Weaver, Dec. 10, 2014 in Arnett, OK.
Workforce retention has also been a major challenge across the county. A large number of staff left their county positions in the early 2010s to work with oil firms, and the county responded by increasing pay substantially. All 72 employees at that time received a $500 per month bonus in 2010, and each year since has seen additional $200 per month bonuses for all county staff who have stayed in their positions. The county has also expanded its personnel. In previous years, fire and EMS positions were filled by volunteers, but the labor shortage resulting from oil and gas development forced the county to begin hiring professionals.

### 3.6.1.1.2 Roger Mills County, OK

Roger Mills County (pop. ~3,700) lies just south of Ellis County and has had a different experience than its neighbor. According to local officials, county roads were in good shape prior to the increase in oil production, thanks in large part to substantial revenue from pre-existing natural gas production (see Figure 16). As heavy vehicle traffic increased with the more recent growth in oil production, Roger Mills County had in place a road network that could handle the growth, with a substantially larger share of paved roads than its neighbor to the north (OK Department of Transportation 2015). Overall, the net fiscal effects there have been a large positive.

![Figure 16: Natural gas production in Ellis and Roger Mills Counties](image)

This solid infrastructure foundation allowed revenues to keep up with road costs and other increased service demands. Allocations from the state’s Gross Production Tax has been the largest direct revenue source for the county, and local officials cite the revenues of the mid-2000s as
particularly helpful.\textsuperscript{45} Sales tax revenues have also grown rapidly, from less than $1 million in 2003 to $5.3 million in 2012 (OK State Auditor and Inspector 2003-2013), which local officials attribute to oil and gas activity. Property tax revenues have not grown substantially, although oil and gas property accounts for roughly 24 percent of county-wide valuation (45 percent if refineries, processing plants, compressor stations, and oil and gas industry facilities are included) (OK Tax Commission 2014). The county also collects revenues from several small oil and gas leases of county-owned minerals, and roughly $100,000 per year from fees associated with permits for pipelines to cross county right-of-ways. These revenues support county staff overseeing the relevant programs.

In addition, in-kind contributions from operators have been more substantial in Roger Mills County than in Ellis County, helping mitigate additional need for repairs. Local officials estimate that operators repair 15 percent to 20 percent of the roads they damage during their operations. It is unclear why these types of contributions occur in Roger Mills County but not in neighboring Ellis.

Along with increased damage to roads, increased vehicle traffic has led to a large increase in call volumes for the law enforcement and EMS crews. Local officials say these increases have mostly been manageable; the county has added one sheriff’s deputy. In addition, workforce retention has been a major challenge across the board. The county recently raised hourly wages to $19 for many low-skilled workers due to high demand for labor from oil and gas operators. Finally, the local officials we spoke with indicated that they had experienced substantial opportunity costs, as a large number of traffic issues coupled with residents’ questions about leasing terms has crowded out time to fulfill other responsibilities.

3.6.1.2 Municipal-level experience in Anadarko basin, OK

3.6.1.2.1 Cheyenne, OK

There are few cities in Roger Mills or Ellis counties, and we were able to arrange an interview only in Cheyenne (pop. ~815), the seat of Roger Mills County. Cheyenne is a small town with little commercial activity, but the few retail shops and restaurants that populate the city provide sales and use taxes, which represent the bulk of revenues. Oil and gas activity has led to a surge in these revenues with little in the way of new costs, resulting in a large net benefit for the city’s finances. The city has been able to make several capital upgrades and purchase new equipment, investments made with cash that would not have been possible without oil- and gas-driven revenues.

\textsuperscript{45} Based on interview with Roger Mills County commission chair Brian Hay, Dec. 10, 2014, in Cheyenne, OK.
Sales and use tax revenue in Cheyenne grew from $250,000 in 2010 to a peak of $715,000 in 2012 before falling to $525,000 in 2014.\textsuperscript{46} Local officials attribute these changes entirely to oil and gas activity. In addition, Cheyenne holds several small oil and gas leases, which have generated roughly $60,000 per year in recent years. For a small city like Cheyenne, these sums are substantial. Finally, the city has received one small in-kind contribution from a company that helped build a basketball court at the city park.

Costs for the city have been relatively modest. Because the state maintains the major arteries running through Cheyenne, road costs have been minimal. And while population has grown somewhat in recent years, the city’s infrastructure was built to serve a larger number of residents, so growth has not resulted in large new costs. However, workforce retention has been a major challenge. The city pays $18.50 per hour for entry-level positions in roads, bridges, and utilities. This wage grows to $20.50 per hour after one year, far higher than would be necessary without competition from the oil and gas sector.

\textbf{3.6.2 Mississippian Lime region, OK}

The Mississippian Lime region lies just across the border from Kansas in northern Oklahoma, and has hosted modest oil production for decades. As we discussed in Section 3.3.1, the Mississippian is not a shale formation, but has seen a major increase in industry activity in recent years. The application of horizontal drilling and hydraulic fracturing to the limestone has dramatically increased oil production from this formation (see Figure 17). On a per capita basis, the Mississippian Lime region has been the most heavily-drilled in our survey, with more than three wells completed per 100 residents in 2013 (see Table A2). On an area basis, it also is one of the most densely drilled regions (see Table A3).

\textsuperscript{46} Provided via internal budgeting system during interview with Cheyenne city manager Niyamaya Yaeger, Dec. 10, 2014 in Cheyenne, OK.
3.6.2.1 County-level experience in Mississippian Lime region, OK

Although the region had some pre-existing pipeline infrastructure, the rapid growth in liquids production, both of oil and wastewater, has vastly increased regional road traffic. This increased vehicle traffic has been a major challenge for every county we examined in the region, and not all counties have been able to keep up with industry-driven damages.

This is in part due to the inability of counties to utilize their general fund ad-valorem property tax revenues for road construction and maintenance. While allocations of the state’s Gross Production Tax provides revenue for county road funds, these revenues have generally not been sufficient, and local officials in each county we examined noted that they would be better off if they could use other revenue sources to manage road damage caused by oil and gas industry traffic. Another common concern in the region relates to earthquakes that have caused damage to public property and may create risks to property values region-wide (Standard and Poor's 2015; Walsh & Zoback 2015).

3.6.2.1.1 Alfalfa County, OK

Alfalfa County (pop. ~5,800) has seen enormous growth in drilling in recent years, and while this activity has generated positive fiscal outcomes for most county government operations, the county has not been able to keep up with road damage brought about by increased industry vehicle traffic. In 2013, 330 wells were completed in Alfalfa County, up from just 15 in 2009. On a per capita and area basis, more wells were drilled in Alfalfa County than any other Oklahoma county in 2013, and the county was among the leaders nationwide in drilling density.
This increased activity has brought about a surge in government revenue from a variety of sources. Property taxes account for roughly 25 percent of the county’s revenue, and assessed value has more than doubled from $44 million in 2005 to $92 million in 2013 (OK State Auditor and Inspector 2003-2013). The county’s cumulative end-of-year fund balances have grown from $6 million in 2005 to $27 million in 2014, general fund revenues grew from $1.2 million to $3.9 million, and highway funds have grown from $2.3 million to $11.8 million over the same period. This growth has been driven by property taxes, sales and use taxes, and—for the highway fund—allocations of the Gross Production Tax. Local officials attribute this revenue growth entirely to oil- and gas-driven economic activity.47

Despite the new revenues, Alfalfa County has not been able to keep up with demand for road repair, which local officials estimate to be $100 million or more due to oil and gas traffic. It appears that the county’s infrastructure was simply not prepared to accommodate the rapid growth in vehicle traffic. Just 20 percent of Alfalfa County’s 1,510 miles of road are paved (OK Department of Transportation 2015), and county commissioners stated that “even our good bridges are caving in.” Oil and gas companies have made some in-kind contributions, but the donations have been irregular and insufficient to manage the demand for materials and labor. They have also been unpredictable: Some companies have made contributions, while others have not. What’s more, regional managers for a single company can differ in their approach, with one manager providing contributions while another from the same company does not. This inconsistency makes it more difficult for the county to prioritize and plan for repairs.

Increased road damage has led the county road crew to grow from 30 to 45 full-time staff, and demand for other services has grown. Demand for law enforcement and judicial services have grown, as the increase in temporary population has led to increased traffic incidents, DUls, and assaults such as fights in bars. The sheriff’s office increased its staff from two to five, which is attributable entirely to oil and gas-related demands. The county has also struggled with workforce retention, losing some of its best staff despite increasing wages to $17.65 per hour for starting employees.

Overall, local officials describe oil and gas activity as very positive for their county’s economic health and they note a number of projects, such as improved ambulance services, which they would not have been able to afford had oil and gas activity not boosted revenues. However, they note two primary concerns: (1) demand for road repairs has far outweighed revenues, leaving county roads in poor condition, and (2) quality of life has declined across much of the county, with

47 Based on interview with Alfalfa County commissioners Doug Murrow, Chad Roach, and Ray Walker, Dec. 8, 2014, in Cherokee, OK.
increased traffic and noise changing the character of the rural region. County officials are concerned that both of these issues may negatively affect the attractiveness of their county for future residents and businesses.

3.6.2.1.2 Grant County, OK

At 15 percent, Grant County (pop. ~4,500) has a lower proportion of paved roads than any other Oklahoma county we examined (OK Department of Transportation 2015). Like Alfalfa County, Grant County has seen large increases in revenue from a variety of sources, and this revenue has been beneficial for some aspects of the county’s fiscal health. But the county is restricted in how and where it can spend its various revenue sources, making it difficult to allocate resources to the areas most in need. Perhaps more importantly, new revenues have not been sufficient to manage increased damage to Grant County roads associated with increased oil and gas vehicle traffic, which local officials describe as devastating.48

Although its population has declined steadily over the past decade, Grant County’s revenues have grown substantially due to oil and gas activity. From 2005 to 2013, total county revenues roughly tripled from $4.7 million to $15 million, and the county’s end-of-year fund balance grew from just $240,000 to roughly $2 million over the same period. These revenues were driven by two main sources. First, property tax revenues grew substantially, driven by an increase in countywide assessed value from $84 million in 2005 to $114 million in 2013 (OK State Auditor and Inspector 2003-2013). Oil and gas property accounted for 40 percent of this assessed value; 86 percent if processing facilities, compressor stations, and gathering lines are included (OK Tax Commission 2014). Second, sales tax revenues grew from $270,000 in 2005 to $4.7 million in 2013, a more than 17-fold increase, which local officials attribute entirely to oil and gas activity.

Allocations from the Gross Production Tax have increased, but because these allocations lag one year behind production levels and most new production had occurred in the year prior to our visit, revenues had been relatively modest as of the end of 2014. The county has one oil and gas lease, which generated $100,000 in bonus payments in 2013, and it has also received some small in-kind donations in the form of help with road damage from companies and the donation of a used vehicle for the sheriff's office. However, assistance from companies with road repair has been sporadic and has not come close to mitigating the damage county-wide.

Costs for roads have increased in a variety of ways. Vehicle traffic on many county roads has grown from roughly 10 vehicles per day to 2,000 vehicles per day, many of them heavy trucks. Local officials report that roads which previously had been repaired every 15 to 20 years now require

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48 Based on interview with Grant County commissioner Cindy Bobbitt, Dec. 9, 2014, in Medford, OK.
annual repairs. With over 1,200 miles of unpaved road in Alfalfa County, this type of maintenance schedule is simply not feasible. Along with demand for repairs, costs for contractor services have grown rapidly due to increased demand from the oil and gas sector. In the 18 months prior to our visit, the county had spent $1.5 million on truck services hauling rock to road maintenance sites, and an additional $1.5 million for the rock itself—far more than in previous years. Damage to bridges has also been substantial, as Grant County needed to repair 13 bridges in 2014, with many more in need of repair due to oil and gas vehicle traffic.

Along with roads and bridges, costs for a variety of other services have grown. Crime has grown substantially due to increased population driven by the oil and gas workforce, and local officials estimate that law enforcement spends roughly 90 percent of their time on oil and gas related issues, either traffic incidents or criminal incidents such as DUIs and bar fights. This increased demand has forced the sheriff’s department to expand its staff from 8 to 13, but this has not been enough to keep up with demand. At the time of our interview, the county wanted to expand its sheriff service to 24 hours per day, but did not have the funds to pay for this expansion. In addition, EMS calls have grown, and fees associated with those calls have not grown as rapidly as costs. Finally, workforce retention in the sheriff’s office and the road and bridge crew has been a major challenge. Grant County has raised its wages roughly 20 percent in the past year, but still was unable to attract or retain the workforce it needed.

Other aspects of county government have benefited from oil- and gas-driven revenues. The county is building a new $500,000 records facility, which was long-needed but only made possible with new revenues. In addition, the county has put $1 million in reserve funds, a savings account it had never had before. However, the inability to spend new revenues on the most acute demands—roads and bridges—has meant that the overall fiscal effects for Grant County have been negative.

3.6.2.1.3 Woods County, OK

Woods County (pop. ~9,000) has had a similar experience with its two neighbors in the Mississippian Lime region. Revenues have grown rapidly with oil and gas activity, but have not been sufficient to keep up with demand for road repairs. Because of restrictions on which revenues can be spent for which purposes, certain aspects of county finances have become stronger, while others—namely roads and bridges—have suffered. In addition, the volatility of key revenue sources, particularly the Gross Production Tax (which is tied to oil and gas prices), has made it virtually impossible for local officials to plan their annual expenditures, and Woods County has operated without a budget plan for their roads and bridges over the past several years.

Total revenues for Woods County grew from $1.6 million in 2005 to $5.3 million in 2013, and the total end-of-year fund balance has more than tripled from $3.5 million to $11 million over
the same period (OK State Auditor and Inspector 2003-2013). Like other counties in the region, this growth has been driven by property taxes associated with oil and gas property and sales and use taxes driven by industry-related economic activity. In 2013, 42 percent of Woods County’s net assessed value came from oil and gas properties, a figure that grows to 87 percent when compressor stations, oil storage facilities, and other equipment are included (OK Tax Commission 2014).

Assessed value in the county grew from $70 million in 2005 to $120 million in 2012, the most recent available year, attributable almost entirely to oil and gas property.\(^{49}\)

Allocations from the state Gross Production Tax have grown with production, but as noted above, volatility has created planning challenges for local officials, and revenues have not been sufficient to manage road damage caused by industry traffic. In-kind contributions from operators have been helpful in some cases, but they are ad-hoc, and have done little in the way of managing the county-wide challenge. Woods County has over 1,200 miles of unpaved roads (OK Department of Transportation 2015).

Staff costs have grown substantially across the county government. The county has added five new staff to the road crew and would like to add more, but does not have the funds. In addition, local officials are cautious to add permanent staff positions due to the volatility of revenue sources such as the Gross Production Tax. Workforce retention has been a modest issue in the sheriff’s office, but Woods County’s workforce is slightly older than other counties we examined, and turnover has been less of a challenge. Finally, demand for sheriff and EMS has grown rapidly with the increased oil and gas workforce. Demand has risen in part due to increased vehicle traffic and accidents, as well as increased criminal activity. County commissioner Randy McMurphy states that the increase in temporary population has brought “more good people and more bad people” to the community.

### 3.6.2.2 Municipal-level experience in Mississippian Lime region, OK

#### 3.6.2.2.1 Cherokee, OK

Local officials in Cherokee (pop. ~1,500), the seat of Alfalfa County, report that oil and gas activity has been very positive for city finances. The city has been able to create a savings funds for the first time, and although there have been some costs associated with industry activity, the city has been able to make capital upgrades that had been needed for years.

Cherokee relies primarily on sales taxes to provide city services, and local officials estimate that these revenues have roughly doubled in the past several years due to oil and gas activity (precise

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\(^{49}\) Based on interview with Woods County commissioner Randy McMurphy, Dec. 9, 2014 in Alva, OK.
figures were not available). The city has also benefited from an oil and gas lease on city property, which has generated $15,000 to $20,000 over the past several years (again, precise figures were not available). Increased revenues from both of these sources have allowed Cherokee to invest in long-needed repairs to its aging sewer and water infrastructure.

The city has also experienced some substantial costs. Local officials report that oil- and gas-driven population growth has led to roughly $300,000 in sewer and water line extensions. Demand for police has also increased due to increased vehicle traffic and accidents, along with increased assaults at local bars and restaurants. However, the city has not needed to expand its police force or purchase new equipment. Perhaps the largest challenge for Cherokee has been related to workforce retention, which has been a major issue. The city has raised its wages and other benefits, but still struggles to retain a skilled workforce. Although precise figures were not available, local officials state that these challenges, while notable, have been small relative to the fiscal benefits driven by increased economic activity.

### 3.6.2.2.2 Helena, OK

Helena’s population is listed as roughly 1,400 in the U.S. Census’ 2014 estimate. However, roughly 1,000 of those residents are housed in a large state prison within city limits, leaving 400 permanent residents in this Alfalfa County town. Like Cherokee, a 25-minute drive to the north, it has also experienced fiscal benefits from oil and gas activity. Helena relies primarily on sales tax revenues, which have increased substantially with oil and gas activity from roughly $135,000 in 2010 to a peak of $205,000 in 2013, then down to $164,000 in 2014. Though a smaller revenue source, revenues from police fines have also tracked oil and gas activity, driven by traffic violations (see Figure 18). Helena has also benefited from a lease on city land, which raised roughly $80,000 in bonus payments.

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50 Based on interview with Cherokee mayor Karen Hawkins on Dec. 8, 2014, in Cherokee, OK.
Although demand for police services have increased, the town has not needed to hire new staff or purchase new equipment, and local officials describe the increase in activity as easily manageable.\footnote{Based on interview with Helena city clerk and treasurer Cynthia Wayman, Dec. 8, 2014, in Helena, OK.} In part, the population-driven impacts seen in Cherokee and Medford have been limited in Helena by an ordinance preventing trailer parks from locating within the town. This has reduced the number of oil and gas workers commuting in and out of the community. Local officials do not report any other substantial costs associated with industry activity.

\subsection*{3.6.2.2.3 Medford, OK}

At just 1.1 square miles, Medford (pop. \textasciitilde1,000) is a small city, but is the seat of Grant County. The city relies primarily on sales taxes, and rapid growth in these revenues have enabled it to invest in a variety of capital projects that had been needed for years. Although certain costs and service demands have also increased, the net effects of increased oil and gas activity has been a large net positive. However, local officials did express concern over earthquakes in the region potentially damaging property and harming the economic viability of the city.

From 2001 through 2010, annual sales tax revenue in Medford hovered a little above $200,000. But in 2011, oil and gas-driven economic activity began boosting sales, which spiked in 2013, generating $712,000 (Medford City Manager's Office 2014). Revenues appeared to have slowed at the time of our visit in 2014, but still remained far above their pre-boom levels. Medford has also
generated revenue from a lease on roughly 120 acres of city land, which generated $100,000 in bonus payments and royalties ranging from $5,000 to $20,000 per month since 2012. In addition, the city has made bulk water sales to operators for hydraulic fracturing, generating $3,500 to $5,000 per month since 2012.52

Medford has also seen increased demand for services, primarily due to increased oil and gas traffic. Roads have not been substantially damaged, but police and fire services have seen an uptick in calls. This increased demand has added strain to existing staff, but the city has not needed to add new personnel or equipment. A distinct concern relates to earthquakes, which have increased in the region and appear to be caused by increased volumes of oil and gas wastewater disposal (Walsh & Zoback 2015). These earthquakes have not caused major damage in Medford, but according to local officials, city residents have increasingly been reporting small cracks in their homes and businesses, leading to fears that property damage will worsen if the earthquakes continue. Despite some attention from state officials to monitor and potentially reduce injections at problematic sites (Wines 2015), a substantial number of earthquakes continue. For example, from June 16 through July 16, 2015, 159 earthquakes of magnitude 2.5 or greater occurred in north-central Oklahoma and south-central Kansas, including a 3.9-magnitude quake in Alfalfa County (U.S. Geological Survey 2015).

### 3.6.3 Woodford shale region, OK

The Woodford was one of the first shale formations that achieved large scale production, following just a few years after Texas’ Barnett shale. Production centered in Coal and Pittsburg counties, about two hours’ drive southeast from Oklahoma City. While Pittsburg County had produced natural gas commercially for decades, Coal County saw its first large-scale activity in the late 2000s and production increased dramatically in Pittsburg County (see Figure 19). As natural gas prices collapsed to below $2/MMBtu in 2012, drilling activity and production declined, and there were no rigs operating in the region during our visit.

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52 Based on interview with Medford, OK city manager Dia Mandevill, Dec. 8, 2014, in Medford, OK.
The Woodford shale region is far more densely populated than either of the other two Oklahoma regions we examined, with 22.8 people per square mile compared with 3.3 in the Anadarko basin region and 6.1 in the Mississippian Lime region. This fact suggests that local governments in the region have a more diverse tax base and greater overall government capacity thanks to more residential and commercial property and greater sales volumes. In addition, the two counties have a greater proportion of paved roads than any other county in our survey, with 37 percent of roads paved in Coal County and 54 percent in Pittsburg County (OK Department of Transportation 2015). The more robust infrastructure and government capacity in the Woodford region has helped limit new costs for county and municipal governments associated with oil and gas development, and enabled all local governments in the region to experience net fiscal benefits from drilling and production in the Woodford shale.

**3.6.3.1 Coal County, OK**

As its name suggests, the economy of Coal County (pop. ~5,900) was heavily reliant on coal mining from its inception near the end of the 19th century through the 1950s. Later in the 20th century, manufacturing played a large role in the local economy, but has faded in recent decades. This decline in economic activity limited government revenue and services for much of the 1990s and early 2000s. Consequently, the surge in economic activity generated by Woodford shale
development in the mid- to late-2000s is characterized by county commissioner Johnny Ward as “the best thing that ever happened” for county finances.\textsuperscript{53}

Total revenues for the county have grown from roughly $2.4 million in 2002 to nearly $7 million in 2010, the most recent available year (OK State Auditor and Inspector 2003-2013). Revenues have declined in recent years due to decreased natural gas drilling and production, but remain well above the levels of the early 2000s. Property tax revenues have been boosted by a surge in natural gas property, which accounts for 46 percent of assessed county-wide valuation. This figure grows to 96 percent, the highest proportion of any county in Oklahoma, when processing plants, refineries, compressor stations, and gathering lines are included (OK Tax Commission 2014). Sales and use tax revenues have grown from $234,000 in 2002 to $1.6 million in 2010, and local officials attribute this growth entirely to Woodford shale activity.

Allocations of the state’s Gross Production Tax have grown from roughly $20,000 per month before Woodford shale activity to a peak of roughly $200,000 per month, and in 2014 were roughly $160,000 per month. The county also leased roughly 45 acres for natural gas production, generating roughly $35,000 per year in lease payments and royalties. In addition, in-kind contributions from operators have been substantial. Local officials estimate that companies helped repair roads on roughly 75 percent of the wells that have been drilled, along with small donations to local schools, fire, and EMS departments.

New costs and demand for services associated with shale development have been noticeable but manageable for the county. Road costs have grown substantially primarily due to rising materials and contractor costs. Local officials attribute this rise to increased demand from operators constructing well pads, roads, and other infrastructure, though they have not been able to quantify the effects. Demand for law enforcement and EMS has also grown, primarily due to increased industry vehicle traffic. This has increased the workload for local services, and resulted in the hiring of five to seven new staff in law enforcement and the county clerk/recorder’s office, which saw increased demand for property records. Workforce retention has also been a modest challenge, with the county losing two or three staff to oil and gas firms and raising wages by 5 percent to 10 percent to compete.

Other expenditures have increased for the county, but local officials describe these new costs as projects that have been enabled by oil- and gas-driven revenue rather than demands that were necessitated by the industry. For example, the county has in recent years built a new building for the sheriff’s department and the local Oklahoma University Extension branch, and made a major renovation to its community center, which primarily serves local seniors and youth.

\textsuperscript{53} Based on interview with Coal County commissioner Johnny Ward, Dec. 12, 2014, in Coalgate, OK.
3.6.3.1.2 Pittsburg County, OK

Pittsburg County (pop. ~44,700) is the most densely populated county we examined in Oklahoma, and is anchored by the city of McAlester. Overall, Woodford shale development has been a net positive for county finances. Although keeping up with demand for road repairs has been a challenge at times, the county’s overall fiscal health has improved due to increased revenues related to oil and gas development.

Overall revenue for Pittsburg County has grown from roughly $11 million in 2005 to $22 million in 2013, and the county’s end-of-year fund balance has grown from roughly $4 million to nearly $20 million over the same period (OK State Auditor and Inspector 2003-2013). This buildup in funds was made possible by large surpluses in the most active drilling years of 2007 through 2010. One leading revenue source during this period were sales and use taxes, which grew from roughly $400,000 per month to a peak of $900,000 per month, and in 2014 stood near $500,000 per month. Local officials attribute most of this additional revenue to Woodford shale activity. The second leading source has been allocations of the Gross Production Tax, which peaked as high as $700,000 per month, and in 2014 generated roughly $225,000 per month.

Oil and gas property accounts for 16 percent of overall assessed property value (45 percent when processing, gathering, and compression facilities are included), a relatively modest sum compared with neighboring Coal County, but still a large share of Pittsburg County’s tax base (OK Tax Commission 2014). Oil and gas leases on county property have generated up to $3,000 per month in certain months, but in 2014 were generating closer to $500 per month, as production fell and no new wells were drilled in recent years. In addition, in-kind contributions from operators have been helpful for road repairs, though this assistance is provided on an ad-hoc basis and local officials were not able to quantify the magnitude of the contributions.

Road damage has been the primarily challenge for Pittsburg County, and during the peak of activity, the county was not able to keep up with demand for road repairs. However, the county has in recent years been able to catch up as industry activity slowed and revenues remained strong. Part of the challenge in Pittsburg County is related to a road classification issue with the state of Oklahoma. Pittsburg County contains nearly 1,700 miles of roadway, but because just 1,200 miles of these roads are “certified” according to state funding rules, the county does not receive state aid to maintain the approximately 500 miles of its roads that are not certified. As a result, road maintenance is a challenge in Pittsburg County regardless of oil and gas activity, and heavy drilling in the late 2000s exacerbated this issue.

54 Based on interview with Pittsburg County commissioner Kevin Smith, Dec. 10, 2014, in McAlester, OK.
Other county government costs related to oil and gas development have been modest. Call volumes increased for the county sheriff and EMS offices, but neither department added staff. Workforce retention was a small issue, as the county lost only a few staff members to the oil and gas sector and did not raise wages to compete. Similar to Coal County, Pittsburg County did see new capital expenditures, spending $10 million for a new jail and $9 million for a new courthouse – paying cash in both cases. These upgrades had been needed for many years, and local officials describe the projects as enabled by oil and gas revenues rather than necessitated by increased demand for services.

3.6.3.2 Municipal-level experience in Woodford shale region, OK

3.6.3.2.1 Coalgate, OK

Coalgate (pop. ~1,900) is the seat of Coal County, and has struggled economically in recent years due to the closing of a clothing manufacturing plant, which employed hundreds of residents and provided much of the economic base for the community. City manager Roger Cosper stated that oil and gas activity “saved our bacon” by supporting tax revenues and providing new employment opportunities for residents. The city has also seen increased costs, which have faded over time while revenues remain higher than before Woodford shale development.

Coalgate relies primarily on sales and use taxes for its general fund, and these revenues more than doubled in the late 2000s due to increased economic activity associated with shale development. With the slowdown in drilling, these revenues have declined, but remain well above their pre-boom levels. Hotel taxes and leasing revenue from a small plot of city land have also contributed, adding roughly $3,000 per month in 2014, though they were higher during the most active years of development. The city sells bulk water to operators for hydraulic fracturing, which has generated an estimated total of $250,000 since Woodford shale development began in earnest. Finally, in-kind donations have been substantial, with companies donating an estimated $4,000 to $5,000 per year in specialized fire and EMS equipment, along with providing training for fire and EMS personnel in dealing with oil- and gas-related accidents.

Costs associated with shale development were large during the most active years of development, but have faded over time. Demand for law enforcement, EMS, and fire all increased substantially due to vehicle accidents; calls for accidents at oil and gas facilities; and increased DUIs, bar fights, and other issues generated by the oil and gas workforce. The city added two police positions to manage these issues, which added roughly $150,000 per year in new costs. In addition, workforce retention has been a major challenge, and the city lost roughly one-third of its workforce.

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55 Based on interview with Coalgate city manager Roger Cosper, Dec. 12, 2014, in Coalgate, OK.
during the initial surge in activity in the mid-2000s. This issue has continued, with Coalgate struggling to find high-quality staff to fill these positions.

Coalgate’s largest recent expenditure was $1.5 million for a new EMS/police/fire/911 dispatch building. This investment was needed because of increased oil- and gas-related demand for services, and would not have been possible without increased revenues from oil and gas activity (the city paid $1.2 million in cash). As a result, Coalgate now has improved public health and safety services and, while shale development made this investment necessary, local officials see the facility as a major improvement and an overall benefit for the community.

3.6.3.2.2 Krebs, OK

Krebs (pop. ~2,000) lies just east of the much larger city of McAlester in Pittsburg County. Because of its small size and limited base for revenue, the city has seen little in the way of fiscal impacts from Woodford shale activity. Local officials report that the overall fiscal impact has been roughly neutral, with modest revenue growth coupled with increased costs from industry-related road damage.

Krebs relies heavily on sales and use taxes, which in FY 2012 generated roughly half of its general revenue (OK State Auditor and Inspector 2003-2013). Local officials report that shale development modestly boosted these revenues, but the effects were limited because most retail activity occurs across the border in the larger city of McAlester. Krebs received roughly $4,000 in leasing revenues for 140 acres of city-owned land, a surprisingly small sum of roughly $29 per acre, and no production has yet occurred. There has also been one in-kind donation of a used pickup truck, which has been helpful for a city with limited revenues.

Costs have also increased due to oil and gas activity, primarily from two causes. First, road damage has been an issue, as two oilfield service firms located within the city have generated substantial heavy vehicle traffic on city streets. Sewer costs have also grown, as one oil and gas facility has caused a substantial increase in runoff, negatively affecting the city’s sewer treatment plant. Local officials were not able to quantify the magnitude of these challenges, estimating that the benefits have roughly equaled the costs.

3.6.3.2.3 McAlester, OK

McAlester (pop. ~18,000) is the seat of Pittsburg County, and is the largest city in the Woodford shale region. Its economy is more diversified than its neighbors and, although the effects have been fairly modest, Woodford shale activity has generally been positive for city finances. Prior

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56 Based on interview with Krebs city manager Ed Klink, Dec. 11, 2014, in Krebs, OK.
to Woodford shale activity, the city ran an annual deficit each year between 2004 and 2007. In 2008, when a new city manager took over and cut costs, Woodford shale activity substantially boosted revenues, leading the city to surplus in every year since 2008.

Like other cities in Oklahoma, McAlester relies heavily on sales and use taxes for general revenues. Woodford shale development was the primary driver of an increase in these revenues from $10.8 million in 2004 to a peak of $15.8 million in 2008. Revenues fell to $13.7 million in 2010, but had returned to $14 million by 2013, the most recent available year (OK State Auditor and Inspector 2003-2013). Hotel tax revenues also grew substantially, from $115,000 in 2004 to a peak of $686,000 in 2008, with an occupancy rate of 96 percent. In 2013, revenues were $471,000. Leasing revenues for McAlester are also substantial, with $1.1 million in royalties in 2014 from natural gas production on city-owned land. In addition, the city has received several used pickup trucks from companies as in-kind contributions, and has made roughly $250,000 in bulk water sales to operators for hydraulic fracturing.

Direct costs for the city have been modest. Because of its substantial size and pre-existing government capacity, increased service demands were not a major challenge. The city has laid off a substantial number of employees in recent years, but this was due to pre-existing fiscal issues (as noted above, the city had been running deficits for years prior to 2008). However, the oil and gas sector did contribute somewhat to these fiscal challenges primarily due to workforce retention issues. In the mid-2000s as Woodford shale activity began in earnest, the city increased salaries to retain staff. This increase contributed to, though it was not the primary cause of, McAlester’s fiscal woes. The city manager notes that heavy government reliance on oil- and gas-related revenues is not an ideal situation, and that economic diversity has been a priority for the city in recent years.

### 3.7 Utah

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<th>Table 21. Utah County Summary</th>
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<td>Major revenue source(s)</td>
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<td>Major cost(s)</td>
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<td>Net fiscal impact</td>
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57 Based on interview with McAlester city manager Peter Stasiak, Dec. 11, 2014, in McAlester, OK.
Table 22. Utah Municipality Summary

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<th>Major revenue source(s)</th>
<th>Lease revenues</th>
<th>Sales tax</th>
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<td>Emergency services</td>
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<td>Net fiscal impact</td>
<td>Medium to large net positive</td>
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### 3.7.1 Uintah basin region, UT

Eastern Utah’s Uintah basin boasts an array of natural resources, including large deposits of conventional oil and gas, tight sands, oil sands, oil shale (aka kerogen), and more. Hydrocarbons have been produced from the region for decades, but activity has increased substantially in recent years, first in Uintah County due to growing natural gas production (see Figure 20) and then from oil production in Uintah and neighboring Duchesne County (see Figure 21).

**Figure 20: Natural gas production from leading Uintah Basin counties**

Data source: Utah Department of Natural Resources, Oil and Gas Division (2015).
Figure 21: Oil production from leading Uintah Basin Counties

The primary types of oil produced in Duchesne and Uintah counties are known as “black wax” and “yellow wax,” heavy oils with high paraffin content (paraffin is an important component for waxes and industrial lubricants). Because this oil does not flow at room temperature, producers need to heat the oil underground before it can be pumped to the surface. Transporting the oil via pipeline from the Uintah basin is not economical, as the oil must remain at a high temperature so that it does not solidify. To overcome this challenge, operators have turned to specially-designed insulated trucks that carry the waxy oil roughly three hours west to refineries near Salt Lake City. In addition, a number of crude-by-rail facilities have emerged in Carbon County that can handle the waxy crude, providing another option for shipping to more distant refineries.

Because of these logistical issues, heavy truck traffic in the area is constant, and state revenue allocation policies have not always provided sufficient revenue for local governments to manage the impacts associated with this activity. Local governments in Utah may apply their ad valorem property taxes to oil and gas property, including to the value of the reserves. They also typically collect sales taxes, which are supported directly by oil and gas equipment sales and indirectly by oil- and gas-related economic activity.

Utah allocates a portion of its severance tax collections to the Uintah Basin Revitalization Fund, which provides grants and loans to local governments in Duchesne and Uintah Counties, and the Ute tribe living on the Uintah or Ouray Reservations. From FY 2011 through FY 2013, these allocations totaled roughly $32 million (Uintah Department of Workforce Services 2015). However, a more substantial source comes from revenues generated by federal oil and gas leases, allocated to...
Local fiscal effects of oil and gas development in eight states

Raimi and Newell

communities through grants and low-interest loans administered by a state Community Impact Board (CIB). Between fiscal years 2010 and 2014, the state collected roughly $770 million from oil and gas production on federal lands, with 78 percent generated in Carbon, Duchesne, or Uintah Counties. Roughly half of this revenue went to the CIB for future grants and loans to local governments. However, just 56 percent of grant and loan awards went to these three counties over the same four-year period, with the remainder allocated to other county and municipal governments across the state (Utah Permanent Community Impact Board 2014).

3.7.1.1 County-level experience in Uintah basin region, UT

Counties in Utah maintain rural road networks, provide public health and safety services, maintain county-wide property records, and more. Property taxes tend to be the largest source of revenue for counties, with a substantial share of property valuation in eastern Utah provided by oil and gas reserves and equipment.

3.7.1.1.1 Carbon County, UT

Carbon County (pop. ~21,000), where population decline and stagnant economic growth has been the norm since roughly 1980, has faced greater fiscal challenges than any other local government we examined in Utah. Carbon County, which neighbors Uintah and Duchesne to the south, is home to several large rail terminals, where trucks deliver black and yellow wax for shipment to more distant refineries. Due primarily to road damage associated with heavy vehicle traffic, it appears that revenues have not been sufficient to manage the impacts associated with oil and gas development in and around the county.

Carbon County has relatively little oil and gas production within its borders, and most of the production that does occur is on private, rather than federal, land. Since Community Impact Board grants are funded solely by production from federal lands, Carbon County has seen less funding than its northern neighbors, despite bearing a large share of the costs associated with heavy truck traffic from the nearby oil fields. From 2010 to 2014, local governments in Carbon County received roughly $86 million in CIB grants and loans, well below the $104 million and $122 million awarded to Duchesne and Uintah counties, respectively (Utah Permanent Community Impact Board 2014).

Local officials describe these CIB allocations as very helpful, but other revenue sources have not kept pace with demand for services. Oil and gas property in 2013 accounted for 23 percent of county-wide assessed value, but property tax revenues have grown slowly, rising from $5.7 million in

58 Based on interview with Carbon County clerk-auditor Seth Oveson and director of economic development Tami Ursenbach, April 28, 2015, in Price, UT.
2005 to $7.1 million in 2013. Sales tax revenues have been stagnant—hovering around $2 million each year since 2005 (Utah State Auditor 2005-2014).

Local officials have crafted “encroachment ordinances,” which require oil and gas operators to pay for any “extraordinary” uses of county roads. While these agreements have been helpful, they have not been sufficient to manage increased demand for repairs. A recent upgrade to one long stretch of road located in the historic Nine-Mile Canyon area cost $36 million, paid for with $5 million in county funds, $10 million from industry, and the remainder from the state and neighboring Duchesne County, where most of the oilfield traffic originates. However, local officials describe road maintenance issues as a continued challenge.

A variety of other costs have created fiscal challenges for the county. Although population has declined, law enforcement has grown from roughly eight officers to 18 as increased oil and gas activity in remote areas has required more officers and more regular patrols. A variety of emergency services have also expanded to accommodate the industry, with the county ambulance fleet growing from four to six and adding staff to cover its expanded service area. In addition, the new oil-by-rail terminals around the county require specialized fire equipment and training. At the time of our interview, county officials did not have the funds to purchase the equipment they believe is needed to manage potential emergencies at these terminals.

Overall, local officials in Carbon County describe the oil and gas industry as a large benefit for the county’s economic health and its employment base, as other industries such as coal mining have struggled in recent decades. However, the county government faces a number of high costs associated with the industry and revenues have not kept pace with growing demand for services.

### 3.7.1.1.2 Duchesne County, UT

Duchesne County (pronounced due-SHAYNE, pop. ~20,000) has seen a surge in oil production in the past 10 years. The region had experienced smaller “booms” in previous decades and, as a result, a substantial number of oil- and gas-service firms existed prior to the uptick in drilling and production in the 2000s. Because of this existing workforce, rapid growth in industry activity did not lead to rapid population growth, limiting any increase in demand for services that can occur in regions with rapid in-migration of workers. Because of this limited population growth and substantial new revenues, oil and gas activity in the Uintah basin has been a large net positive for the county’s finances.

From 2005 through 2013, tax revenues for Duchesne County grew sharply, with property tax receipts rising from $3.4 million to $8.6 million, and sales tax collections growing from $1.7 million to $4.5 million (Utah State Auditor 2005-2014). In 2013, 44 percent of county-wide assessed valuations were from oil and gas property (Utah State Tax Commission 2013), and local officials
attribute increased sales tax receipts primarily to oil and gas activity. In addition, the county
government has received nearly $8 million in grants and loans from the CIB from 2010 to 2014,
while the Duchesne County Special Service District (which is an independent entity but provides
similar services such as road maintenance and repair) has received nearly $28 million over the same
period (Utah Permanent Community Impact Board 2014).

Road and bridge costs have been substantial across Duchesne County. Because virtually all
of the oil produced within the county is shipped via truck, heavy vehicle traffic across county roads
is substantial. Operators sometimes repair the roads that they damage or make cash contributions to
the county government for repairs, but these contributions are informal and irregular, often
increasing when oil prices are high and falling when they are low. From 2005 to 2013, expenditures
on roads grew more rapidly than any other category, increasing from $1.9 million (15 percent of
total expenditures) to $6.6 million (28 percent). These increased expenditures have not always been
enough to keep pace with demand. In recent months, the county reverted one large stretch of road
from paved to gravel because of damage caused by oilfield traffic.

Workforce retention is the second-leading issue for the county. Maintaining adequate
staffing in the sheriff’s department and the county-run prison (which houses prisoners from across
the state) has been a particular challenge, largely attributable to the high wages offered in the oil and
gas sector.

3.7.1.1.3 Uintah County, UT

Uintah County (pronounced you-IN-tuh, pop. ~36,000) has historically been Utah’s leading
oil and gas producer, and its economy is heavily dependent on the oil and gas sector. In roughly the
past decade, technological advances have made large deposits of natural gas accessible, leading to a
substantial increase in oil- and gas-related revenues along with increased industry-related costs.
Similar to Duchesne County, production growth has not led to rapid population growth and overall
it appears that revenues have easily outweighed increased costs and demand for services for the
county government.

From 2005 through 2013, property tax revenues roughly doubled from $8.3 million to $16.6
million thanks largely to growth in oil and gas property (Utah State Auditor 2005-2014), which in
2013 accounted for 48 percent of county-wide valuation (Utah State Tax Commission 2013). During
the most active drilling years of 2006 through 2008, sales tax revenues also grew dramatically from
$6.6 million in 2005 to a peak of $13.8 million in 2008, then steadily declined to $7.9 million in 2013

59 Based on interview with Duchesne County commissioner Greg Todd and director of economic development Irene
Hansen, April 28, 2015, in Duchesne City, Utah.
(Utah State Auditor 2005-2014). These trends demonstrate clearly how sales tax revenues tend to fluctuate in step with oil- and gas-driven economic activity, while property tax revenues associated with oil and gas property tends to lag drilling and production (see Figure 22).

**Figure 22: New wells drilled and tax revenues in Uintah County**

Data sources: Drilling Info/DI Desktop for new wells entering production each year (completion data were not available). Utah State Auditor (2005-2014) for tax data.

Costs and demand for services have also increased alongside oil and gas activity. Damage to roads and bridges have been substantial. However, because most oil and gas production takes place in little-traveled parts of the county, impacts to residents have been small. In addition, road

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60 Based on interview with Uintah County Commissioner Bill Stringer, April 27, 2015 in Vernal, UT.
maintenance agreements between the county and operators are common. As a result, oil and gas companies cause substantial road damage but pay heavily to make necessary repairs, while other local businesses and residents are not heavily affected. County spending on roads has ebbed and flowed with industry activity, growing from 14 percent of total expenditures in 2005 to 16 percent in 2008, then falling back to 13 percent in 2013. Spending needs have remained manageable in part due to grants from the CIB to the independent county-wide transportation district, which helps pay for needed repairs.

Workforce retention has been the largest challenge for the county government, particularly law enforcement and the county and special district road crews. High turnover rates are ever-present, and filling open positions has been a large challenge. These trends were exacerbated during the most active drilling years of 2006 through 2008, and the county has needed to raise its wages substantially to compete with the high-paying oil and gas sector. In addition, law enforcement demands tend to shift with industry cycles. During “boom” periods, there was increased demand due to DUIs and burglaries. During “bust” periods, the frequency of these crimes diminished, but assaults and domestic violence cases increased – possibly due to increased cohabitation, local officials speculate.

3.7.1.2 Municipal-level experience in Uintah basin region, UT

Cities in the Uintah basin raise revenue primarily through sales taxes, fees for services, and grants from the state and federal governments. Each of these revenue sources is affected directly or indirectly by oil and gas activity, the region’s economic driver. The clearest direct link between oil and gas activity and revenue are grants and low-interest loans from the CIB, which have been substantial for all three cities. For all three cities we examined, revenues associated with the industry have easily outpaced increased costs or demand for services.

3.7.1.2.1 Duchesne, UT

Duchesne, the seat of Duchesne County, is a small city (pop. ~1,800) with a population that has grown steadily over the past 15 years. In 2014, just 11 percent of the city’s total revenues came from sales taxes, while a much larger portion came from charges for services such as utilities and grants from the state government. Grant awards from the CIB have easily been the largest revenue source associated with oil and gas development, led by roughly $5 million in grants and $2 million in low-interest loans between 2010 and 2014 (Utah Permanent Community Impact Board 2014). For a small city like Duchesne, these sums are very large, with total FY 2014 revenues totaling just $2.9 million (Utah State Auditor 2005-2014).

Sales tax revenues for the city are supported indirectly through oil and gas-driven economic activity and employment and, while precise quantification is difficult, local officials describe the
effect as very large.\textsuperscript{61} Other revenues include hotel occupancy taxes from the city’s single hotel, a five-acre plot of city property leased to an oil and gas firm for $25,000 in 2015, and a consistent revenue stream from bulk water sales of city water to oil and gas operators (precise figures were not available). Finally, in-kind contributions have been ad-hoc but substantial. For example, oil and gas companies donated $150,000 for the construction of the bulk water station, $20,000 to $30,000 in labor and equipment to construct new lighting at a city recreation center, and other donations to construct a veteran’s memorial near city hall.

Duchesne has also seen some costs, led by damage to roads. Large trucks carrying black and yellow wax stream through Duchesne continuously, speeding road deterioration and occasionally causing acute damage. Local officials describe this issue as substantial, but generally manageable due to grants designed to address the problem by the CIB. Other city services such as water and wastewater, policing, and recreation, are affected indirectly by the oil and gas workforce, but increased oil and gas activity in the region has not led to a disproportionate increase in demand for these services. Finally, the city’s EMS has seen an increase in calls to deal with incidents at well sites, along with increased training to manage potential accidents involving crude oil or other hazardous materials transported through the city by truck. However, the city has not needed to add new staff or increase expenditures substantially.

\section{3.7.1.2.2 Price, UT}

Price (pop. \(\sim8,500\), the seat of Carbon County, is a larger city than Duchesne, but its population has contracted somewhat over the past 20 years as coal mining and other manufacturing jobs have moved away. The city relies for revenue primarily on charges for services (52 percent of total revenues in 2014) and sales taxes (30 percent) (Utah State Auditor 2005-2014). There is relatively little oil and gas production near the city, but several crude oil rail terminals surrounding Price have boosted employment, economic activity, and heavy vehicle traffic. Overall, the recent increase in oil and gas activity has benefited city finances.

The city and its associated Water Improvement District, which provides sewer and water services, have received roughly $7 million in grants and $6 million in low-interest loans from the CIB from 2010 through 2014 to fund a variety of infrastructure improvements (Utah Permanent Community Impact Board 2014). These awards have been the leading revenue source associated with the oil and gas industry, but local officials also state that sales and property taxes are supported by the oil and gas workforce.\textsuperscript{62} Price has raised roughly $200,000 from city-owned oil and gas leases, and one oil company has made donations of roughly $10,000 each year to the city fire department.

\textsuperscript{61} Based on interview with Duchesne City mayor RoJean Rowley, April 28, 2015, in Duchesne, UT.

\textsuperscript{62} Based on interview with Price director of finance Lisa Richens, April 29, 2015, in Price, UT.
Damage to roads and bridges from oil and gas traffic within the city has been an issue in Price, but local officials have not attempted to quantify the impacts, and describe the challenge as manageable. The leading quantifiable cost for the city has been in fire and EMS. Because of new crude-by-rail terminals near city limits, Price needs to spend roughly $150,000 for new trucks and expand its fire building to house these new vehicles. Officials are considering applying for a grant from the CIB to pay for these upgrades.

### 3.7.1.2.3 Vernal, UT

Vernal is the largest city in eastern Utah (pop. ~10,300) and has been growing steadily for the past 25 years. Oil and gas development has been the leading driver of this growth, and despite a number of challenges, local officials describe the industry as providing large fiscal benefits for both the local economy and for Vernal’s public finances. Like other local economies heavily tied to the oil and gas sector, revenue has been highly cyclical, following trends in Uintah basin oil and gas development. As Figure 23 shows, sales tax revenues and, to a lesser extent, charges for services, tend to rise and fall with the number of new wells drilled and completed in the region.

**Figure 23: New oil/gas wells in Duchesne and Uintah Counties and revenue in Vernal, UT**

![Graph showing new oil/gas wells and revenue over years](data:image/png;base64,iVBORw0KGgoAAAANSUhEUgAAAwAAAAAbCAYAAADe3xGgAAAgAElEQVR42mOgZ...)

Data sources: Drilling Info/DI Desktop for new wells entering production each year (completion data were not available). Utah State Auditor (2005-2014) for tax and revenue data.

This revenue volatility poses a substantial planning challenge for the city. One way of addressing this challenge has been to utilize CIB grants and loans for major capital projects. Vernal has collected $7.4 million in grants and low-interest loans from the CIB from 2010 through 2014, with most of these awards targeted towards new buildings and office space. In addition, the city generally budgets cautiously, investing revenue from “boom” years in capital projects and being
prepared to cut certain expenses quickly during “bust” years.\textsuperscript{63} Other revenues are also tied to oil and gas activity, but are less important for the city’s overall finances. These include hotel tax revenues, property taxes, and small contributions from oil and gas companies for various community events.

Because Vernal is not located near the center of the oil- and gas-producing region, heavy vehicle traffic is limited, and has not been a major issue for the city. Indirectly, the oil and gas workforce affects most city services, including passenger vehicle traffic and demand for sewer and water services. Local officials report that demand for law enforcement is closely tied to oil and gas industry cycles, led by increased calls for traffic incidents, DUIs, domestic violence, and aggravated assaults (often at bars or restaurants). Similarly, demand for jail and judicial services, for which Vernal authorities only handle misdemeanors, has also tracked oil and gas activity.

The recent increase in oil and gas activity has led the city to expand its general administrative workforce by four or five staff, and workforce retention has grown as a challenge. The city regularly loses staff to the oil and gas sector, and the extent of the challenge tends to track oil and gas activity. Each of these issues have presented challenges for local officials, but have generally remained manageable.

3.8 West Virginia

<table>
<thead>
<tr>
<th>Major revenue source(s)</th>
<th>Property tax</th>
<th>Lease revenue</th>
<th>Severance tax</th>
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<td>Major cost(s)</td>
<td>EMS services</td>
<td>Administrative staff</td>
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<tr>
<td>Net fiscal impact</td>
<td>Medium to large net positive</td>
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Table 24. West Virginia Municipality Summary

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<th>Major revenue source(s)</th>
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<th>Severance tax</th>
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<tr>
<td>Major cost(s)</td>
<td>City streets</td>
<td>Workforce retention</td>
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<tr>
<td>Net fiscal impact</td>
<td>Roughly neutral to medium net positive</td>
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</tbody>
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\textsuperscript{63} Based on interview with Vernal city manager Ken Bassett, April 27, 2015, in Vernal, UT.
3.8.1 Marcellus shale region, WV

While it is better known for coal production, West Virginia has also produced natural gas for decades. Since the early 2010s, this production has grown dramatically due to development of the Marcellus shale in the state’s northern counties. We traveled to four of the leading natural gas producing counties (shown in Figure 24), and conducted interviews with two county governments and three municipalities. Drilling activity in the region has been substantial in the previous five years, with more than 20 wells drilled per hundred square miles (see Table A3). While this level of activity has certainly been noticeable for local officials, it has not caused a rapid increase in population due to the relatively dense population of the region (roughly 75 inhabitants per square mile, as shown in Table A1).

Figure 24: Natural gas production from select West Virginia Counties

<table>
<thead>
<tr>
<th>Year</th>
<th>Wetzel</th>
<th>Marshall</th>
<th>Harrison</th>
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Data source: DI Desktop.

3.8.1.1 County-level experience in Marcellus shale region, WV

Counties in West Virginia have collected revenue directly from a range of oil- and gas-related sources. First, counties in West Virginia apply their ad valorem property taxes to the estimated value of the underground resources. Second, the state government allocates 10 percent of oil and gas severance tax revenues to counties and municipalities (the lion’s share of this allocation is retained by counties), with 75 percent flowing to oil- and gas-producing counties based on production volumes, and the other 25 percent flowing to counties based upon population levels (West Virginia Annotated Code 2015). Other revenues including leasing bonuses, royalties, and in-kind contributions have also been valuable for counties in the region. West Virginia counties do not levy sales taxes, minimizing any effect of indirect, population-based revenue effects.
Unlike most other states, West Virginia counties are not responsible for road maintenance and repair, as this responsibility falls upon the state Department of Transportation; nor are they responsible for human services, which are also provided by the state. However, counties do provide most other typical services such as law enforcement, record-keeping, and emergency services.

3.8.1.1 Marshall County, WV

Marshall County (pop. ~32,000) has seen a variety of new revenue sources associated with Marcellus development as well as some increased costs, demand for services, and damage to local roadways. Despite these various challenges, local officials describe the net fiscal impact to date as clearly positive.

Property tax revenue, largely driven by oil and gas property, grew from $5.5 million in 2005 to $8.7 million in 2013, and is projected at $13 million for 2016. Allocations of state oil and gas severance taxes also grew from roughly $25,000 in 2008 to $430,000 in 2013. This increase was helpful, as county revenues from coal severance taxes fell from $4.7 million in 2011 to $3.5 million in 2013, with further declines projected (West Virginia Auditor's Office 2005-2013a).

Other sources have been led by leasing revenues, with roughly $250,000 for a lease on 40 acres of county land, as well as a $2.1 million lease for land owned by the county parks and recreation division, a separate governmental authority from the county itself. Finally, a variety of companies donated funds to purchase a new $250,000 emergency response vehicle, and one company purchased body cameras for local sheriff’s deputies.

Along with these new revenues have come noticeable, but hard-to-quantify increases in demand for services associated with Marcellus shale development. For the county’s all-volunteer EMS personnel, there has been an increase in responses to well pad fires. While these fires have been rare, their intensity has at times put a strain on the service. In the early years of Marcellus activity, first responders would be required to stay at the well site for days at a time until specialized oil and gas fire crews could be flown in. More recently, the county’s Office of Emergency Management worked with operators so that county personnel would no longer be required to stay at the well site for such long periods. There has also been some increase in demand for law enforcement due primarily to increase vehicle traffic and accidents, though this increase has been fairly modest and has not required any new personnel.

In the county clerk’s office, several part-time staff were added to manage an influx of “land men” searching county records, which required the office to spill into county courthouse hallways and expand business hours, adding costs. In addition, a number of county records were damaged by these researchers, who in some cases ripped 100-year old pages from county record books. Finally, the county has struggled with workforce retention as the oil and gas industry has moved into the
region. Finding well-qualified staff has always been a challenge, but labor demand from the oil and gas sector has exacerbated the issue, leading the county to raise wages for all staff in recent years.

Another challenge—road damage—does not directly impact the county budget, but does have an important effect on local economic activity and quality of life. Road damage has been a major issue along many of the winding Appalachian roads that cross the region, largely due to drilling activity and pipeline construction. Local officials have sought to encourage the state to invest more in roads, but the result to date has not been satisfactory.64

3.8.1.1.2 Wetzel County, WV

Wetzel County (pop. ~16,000) is a relatively poor county, with high rates of unemployment (12.5 percent in March 2015) and low levels of household and per capita income compared with national and West Virginia averages. The county’s population has also been declining steadily for the past 30 years, and local officials hoped that Marcellus shale activity would provide a substantial boost in employment opportunities for the county. As it turns out, shale development has been highly positive for the county government, but made less of an impact on the local private economy, with unemployment remaining at stubbornly high rates.

The leading revenue source for the county has been from property tax revenues, which grew from roughly $3 million in 2010 to $4.4 million in 2013 (West Virginia Auditor's Office 2005-2013b), and are projected to bring in $7.7 million in 2015. This growth has been driven by the assessed values of the underground minerals as well as equipment such as pipelines, rigs, wellheads, and more. The second leading source has been increased severance tax revenues, which grew from roughly $112,000 in 2010 to $1.4 million in 2014. The county will also collect a total of $560,000 over the next five years from leasing county property, and has received a number of modest donations from oil and gas companies to the county fire and EMS crews, 911 service center, and the county fair.

There have also been some new costs and increased demand for services, but they have been modest relative to new revenues. As in nearby Marshall County, road conditions in the county have deteriorated due to drilling and pipeline construction. While this does not directly affect county finances, it raises the cost of doing business and decreases quality of life for residents. The additional vehicle traffic on local roads, which local officials attribute primarily to Marcellus activity, has led the sheriff’s office to increase overtime pay, though it has not had to add additional staff. First responders have also undergone a variety of new training programs to manage oil- and gas-related spills or fires, and the county clerk’s office has added two full-time and two part-time staff to keep

64 Based on interview with Betsy Fronhapfel, Marshall County clerk, on April 18, 2015, in Moundsville, WV.
up with demand for property records. Finally, the county commissioners note substantial opportunity costs, as they now receive a large number of phone calls from citizens who are either unhappy with road conditions or concerned with road safety due to increased heavy vehicle traffic.65

3.8.1.2 Municipal-level experience in Marcellus shale region, WV

Cities in West Virginia typically raise revenue from sales and property taxes along with charges for utility services such as water and wastewater. Since most drilling activity takes place outside of municipal boundaries, property taxes do not tend to be a major source of oil- and gas-related revenue for cities. However, increased economic activity associated with oil and gas activity may boost purchasing, in turn increasing sales tax revenue. Additionally, a small portion of state-collected oil and gas severance tax revenue is allocated to municipalities in counties based on production, along with a still smaller share to municipalities in counties without drilling.

3.8.1.2.1 Clarksburg, WV

Clarksburg (pop. ~16,000) is the county seat of Harrison County, and its population has shrunk by roughly half over the past 50 years as manufacturing and coal mining jobs have moved away. In recent years, new employers have located in the region including multiple large FBI research and investigation centers, which have helped reinvigorate the economy. Marcellus shale development has also helped to boost local economic fortunes and has in turn benefited the city government’s finances.

The largest effect of shale development has been on the city’s business and occupation tax (similar to a sales tax, it is based on gross receipts for companies), which has been boosted indirectly by purchases made by the oil and gas workforce. While the precise contribution is difficult to quantify, business and occupation tax revenues grew from roughly $6.8 million in 2006 to $9.6 million in 2014, and local officials describe Marcellus shale activity as an important contributor to this growth.66 The second leading revenue source has been the city’s hotel tax, which grew from roughly $179,000 in 2006 to roughly $693,000 in 2014 (West Virginia Auditor's Office 2005-2014).

Clarksburg receives a small share of the state’s severance tax revenues, totaling $190,000 in 2014. Local officials also believe that the oil and gas workforce has helped support local property values by increasing demand for housing supply. Property tax revenues increased from $2.5 million in 2006 to $3.6 million in 2014. Again, it is not possible to accurately estimate the contribution to these revenues from Marcellus activity, but local officials believe it has been an important factor.

65 Based on interview with Wetzel County Commissioners Donald Mason and Lawrence Lemon, April 8, 2015, in New Martinsville, WV.
66 Based on interview with Clarksburg Director of Finance Frank Ferrari, April 9, 2015 in Clarksburg, WV.
Finally, the city has received occasional small contributions from a variety of oil and gas companies to city events and to support the Clarksburg visitor’s bureau.

Clarksburg has also seen some new costs associated with shale development, led by damage to city streets. Heavy vehicle traffic associated with shale development has increased citizen complaints, added substantial mud and dirt to the roads, and in some cases caused noticeable damage. The city has not attempted to quantify these impacts, but local officials describe it as substantial. Clarksburg law enforcement have also seen increased demands related to increased vehicle traffic as well as increased fights at local bars and DUI citations, which they believe is largely from the oil and gas workforce. Finally, the city has had challenges with workforce retention, losing three to five police officers and two to three employees from public works. While they have not needed to substantially raise salaries to attract new workers, the loss of experience has been a challenge for the affected departments.

3.8.1.2.2 Glen Dale, WV

Glen Dale (pop. ~1,500) abuts Moundsville, the Marshall County seat, and is a relatively small government with just 23 full-time employees and an annual operating budget of roughly $2 million. Overall, Marcellus activity has had little fiscal effect on the city’s finances, with a limited amount of increased revenues along with a small increase in costs associated with the industry.

Several revenue sources have grown slightly for the city due to Marcellus activity. First, hotel occupancy taxes grew from roughly $14,000 in 2008 to more than $30,000 in 2012, the most recent available year (West Virginia Auditor’s Office 2005-2012). Oil and gas severance tax allocations from the state have grown, but are a very small revenue source at just $1,254 in 2011. Local officials also estimate that sales taxes have increased roughly $30,000 per year due to purchases made by the oil and gas workforce at restaurants, hardware stores, and other local businesses.67

There have also been some modest new costs. The leading costs have been associated with new zoning rules developed by the city, which has generally sought to avoid a large oil and gas industry presence. The city has paid substantial attorney’s fees to develop new zoning ordinances, and only one oil and gas company has located within Glen Dale. City police have occasionally been needed to direct oil and gas industry traffic moving through city streets with large equipment, but costs for these services are generally repaid by the relevant company. Finally, one RV park housing mostly oil and gas workers just outside the city received a sewer connection, which added some new costs for city operations.

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67 Based on interview with Glen Dale City Clerk Jane Rickman, April 8, 2015, in Glen Dale, WV.
Based on news stories and reports from other states, city officials had expected a large influx of workers and heavy vehicle traffic from Marcellus activity. However, the impacts to date on both revenues and expenses have been minimal.

### 3.8.1.2.3 Shinnston, WV

The city of Shinnston (pop. ~2,200) has for years been in poor financial health. Due to decisions made in previous decades, the city’s water and wastewater system serves roughly 8,000 people in three counties. As a result, the city has faced large infrastructure costs to maintain and repair these systems, often struggling to raise sufficient revenue to make necessary upgrades. Marcellus activity has had a modest, but positive net effect on the city’s finances due to increased revenues in a variety of areas and little in the way of new costs.

In recent years, allocations from oil and gas severance taxes have grown from roughly $1,000 per year to about $5,000 in FY 2015. Revenues from utility taxes have risen due to several new trailer parks which primarily house oil and gas workers, though these increases generally serve to offset costs associated with the service. Business occupancy tax revenues have grown somewhat due to rising commercial rental rates, which local officials attribute to Marcellus activity, although the magnitude of the effect is difficult to quantify. Finally, the most recent year saw a $9,000 increase in fines, fees, and court costs associated with traffic tickets. Local officials attribute this increase primarily to oil and gas activity, as many of those fined come from states such as Texas and Louisiana.

Costs associated with policing and judicial services have increased as well. Workforce retention also has been a challenge, particularly in the public works department, where plumbers, welders, and other skilled tradespeople often see new opportunities working on natural gas pipelines or gathering and processing systems. Finally, there have been substantial opportunity costs for administrative staff, as resident complaints surrounding oil- and gas-related traffic and temporary housing have grown to occupy a substantial portion of time.\(^{68}\)

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\(^{68}\) Based on interview with Shinnston city manager Travis Blosser, April 9, 2015, in Shinnston, WV.
4. Conclusion

The fiscal effects of oil and gas production on local governments can vary according to a number of local factors. For most regions we examined, oil and gas development—whether new or longstanding—has been and continues to be a net positive for county and municipal finances. For highly rural communities with limited existing infrastructure, large scale increases in oil and gas activity tend to result in large new costs, and local revenue sources may not be sufficient to manage increased demand for services such as road repair, emergency services, and staff costs. For regions that have for decades been highly reliant on oil and gas as an economic and tax base, decreasing production and associated revenues poses important questions. In a number of cases, it is unclear how and whether governments in these regions will be able to adapt to a new fiscal environment.

We offer below several lessons emerging from the fourteen regions examined above:

**Predictable, reliable revenue sources are beneficial** for local governments with revenues that are closely tied to the oil and gas industry. While industry activity inevitably ebbs and flows with changes in regional gas and global oil prices, policies can either mitigate or exacerbate this volatility. Local and state tax policies that help increase predictability and decrease revenue volatility benefit local governments trying to plan for the future.

**Flexible funding mechanisms can complement** these more predictable revenue sources by providing revenue for local governments experiencing unexpectedly high costs associated with oil and gas development. These mechanisms, such as Utah’s Community Impact Grants, offer the benefit of allocating revenue to where it is most heavily needed. However, flexibility also introduces the possibility of revenue being allocated to politically favored jurisdictions or population centers rather than to where oil- and gas-related impacts are most acute.

**Collaboration with oil and gas operators** has provided a major benefit for local governments in some regions, notably Ohio’s Utica shale region. Contributions from oil and gas companies, particularly on road repair, can substantially reduce the costs for local governments trying to maintain infrastructure affected by heavy industry vehicle traffic. These collaborations are often ad-hoc, vary from state to state, and sometimes even within states. Unfortunately, we are not able to offer a strong explanation to explain this variation. Many local officials engaged in these types of collaborations describe them as a result of good communication and personal relationships.

**Rapid, large-scale energy development in rural regions** tends to have the largest impact on local government finances. In those regions, local revenue sources may not be sufficient to manage increased costs. This applies to counties and municipalities at the center of industry activity, and may also apply to jurisdictions adjacent to industry activity, such as Carbon County,
Utah. State policies can play a role in helping to mitigate any negative effects by allocating revenues to impacted regions.

Regions with long-term declining production face a distinct set of concerns from those experiencing rapid development. For these regions, oil- and gas-driven revenues are declining, and it is unclear what, if anything, will replace them. Economic diversification and the related issue of public revenue diversification are goals for officials in these regions, but will be a challenge given the geographic isolation, limited services, and limited infrastructure available to build new engines of growth in many of these communities. The 2014-2015 decline in oil prices is likely to highlight the importance of economic diversification.

Oil- and gas-related environmental issues can play a substantial role in local public finances. In parts of southern California, environmental damage associated with long-abandoned pipelines and oil wells has raised the cost of development for private and public entities alike, draining public funds and reducing private investment. In parts of Kansas and Oklahoma, earthquakes associated with oil and gas wastewater injection has damaged public and private property, creating new costs for local governments and threatening the local tax base.

Alaska faces distinct challenges. Because the state government relies so heavily upon the oil and gas industry for revenue, the many local governments dependent upon grants and other funding from the state face serious fiscal challenges if production-related revenues continue to decline as expected. Economic and revenue diversification is likely to be a challenge for the many isolated communities that populate the state. In order for these communities to maintain public services, it appears that the state government will need to diversify its revenue sources away from oil and gas. This challenge has become more acute in recent months, with low oil prices persisting from late 2014 through the time of this writing.
5. Appendix A

5.1 Interviews and other information

Table A1. Table of plays visited and other information

<table>
<thead>
<tr>
<th>State</th>
<th>Play /region</th>
<th>Experts interviewed</th>
<th>Predominant Type</th>
<th>Well completions in 2014</th>
<th>Population density (persons per sq. mile)</th>
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<tr>
<td>UT</td>
<td>Uintah basin</td>
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<td>Oil, gas</td>
<td>968</td>
<td>9.5</td>
</tr>
<tr>
<td>WV</td>
<td>Marcellus</td>
<td>6</td>
<td>Gas</td>
<td>124*</td>
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</table>

Data sources: DI Desktop for well completions in 2014, based on number of well completions or wells with first production (when completion data were not available) between 1/1/2014 and 12/31/2014. U.S. Census Bureau for population density in 2013. All figures are based on well completions, county populations, and land areas in the counties where we interviewed local officials and other experts. *Well completions in West Virginia are from 2013.

5.2 Methodology for structured interviews

For each interview, we followed a structured format, alternating between starting the interview with a series of questions about potential new costs and a series of questions about potential new revenues. For each type of revenue or cost, we asked if new or increased oil and gas development had (i) caused any change (Y/N/Not sure), (ii) what was the magnitude and direction of that change, and (iii) how confident was the interviewee that the oil and gas industry was responsible, either directly or indirectly, for that change (See Figure 1.1).

In some cases, respondent’s answers did not fit neatly into this format. For example, some local officials stated that they had constructed new buildings because of additional revenue from oil- and gas-related sources. In these instances, the new cost was not in response to a pressing need caused by the industry, but rather a new expenditure that benefited the government, and would not have been possible without oil- and gas-related revenue. We adjusted our notes accordingly.
After completing these two lines of questions, we asked the series of questions below. In some cases, we did not have time to ask all of these questions. However, we did ask every interviewee the question: “Is it possible to say whether there has been a net negative or a net positive impact from shale development on county finances?” and recorded their response.
Figure A1 Sample interview template (West Virginia county)

<table>
<thead>
<tr>
<th>Potential new costs</th>
<th>Any change?</th>
<th>Magnitude</th>
<th>Confidence</th>
<th>Potential new revenues</th>
<th>Any change?</th>
<th>Magnitude</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads/bridges</td>
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<td></td>
<td></td>
<td>Severance tax revenue</td>
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<td></td>
<td></td>
</tr>
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<td>Human services</td>
<td></td>
<td></td>
<td></td>
<td>Property taxes</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Sheriff/EMS</td>
<td></td>
<td></td>
<td></td>
<td>Sales and use tax</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Judicial or jail costs</td>
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<td></td>
<td></td>
<td>Grants from the state</td>
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<td></td>
</tr>
<tr>
<td>Code/permit enforcement</td>
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<td></td>
<td></td>
<td>Sales and use tax</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>New buildings</td>
<td></td>
<td></td>
<td></td>
<td>Leasing or royalty income</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Additional staff</td>
<td></td>
<td></td>
<td></td>
<td>Industry in-kind contributions</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Opportunity costs (staff time)</td>
<td></td>
<td></td>
<td></td>
<td>Other fee for service</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Workforce retention</td>
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<td></td>
<td></td>
<td>Hotel occupancy tax</td>
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</tr>
<tr>
<td>Other costs</td>
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<td>Other revenues</td>
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<td>Overall</td>
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<td></td>
<td>Overall</td>
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</tr>
</tbody>
</table>

Is it possible to say whether there has been a net negative or a net positive impact from shale development on county finances?

Are there significant unmet needs resulting from shale development? If so, are these new needs, increased demand for old services, or both?

If there are unmet needs, is your jurisdiction best equipped to provide those services, or should it be another jurisdiction (state, county, etc.)?

Have any needs decreased? If so, which?

Do you think your jurisdiction receives an appropriate amount of reimbursement from the state to deal with shale development?

What types of policy or business changes could help you manage oil and gas development better?

Do you have any industry contacts who are knowledgeable on these finance issues?
5.3 Identifying counties with the largest levels of oil and gas activity

The following two tables show two different ways of evaluating the scale of oil and gas activity in a given county. Table A2 shows the number of oil or gas wells completed for every 100 persons living within each county for the years 2005 through 2013. This metric helps understand the scale of oil and gas activity relative to the rurality of a region. The counties with the highest numbers in this category include counties in Kansas and Oklahoma’s Mississippian Lime region, and Utah’s Uintah basin, where drilling activity has been extensive and the local population is small. The counties with the lower numbers in this category include counties where little or no drilling occurred in certain years (i.e., Ohio counties in 2010), or in counties with large populations (i.e., Los Angeles).

Table A3 shows the number of oil or gas wells completed for every 100 square miles of county area for the years 2005 through 2013. This metric helps understand the density of oil and gas activity in a given region. The counties with the highest numbers in this category include the Kern County, Marcellus, Uintah, and Utica regions where hundreds or even thousands of wells have been drilled in certain years. The counties with the lower numbers in this category include counties where little or no drilling occurred in certain years (i.e., Ohio counties in 2010), or in counties that cover large areas (i.e., the North Slope and Kenai Peninsula Boroughs of Alaska).
<table>
<thead>
<tr>
<th>State/play</th>
<th>County</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<td>1.0</td>
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</tr>
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</table>

Data sources: DJ Desktop for well completions, based on number of well completions or wells with first production when completion data were not available. U.S. Census Bureau for annual estimated population.
<table>
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<tr>
<th>State/play</th>
<th>County</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
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<td>Alaska</td>
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<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
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<td>-</td>
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Data sources: DI Desktop for well completions, based on number of well completions or wells with first production when completion data were not available. U.S. Census Bureau for land area.
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