Lessons from Gas Patch Communities:
A Local Government Guide for Dealing with Drilling

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About the Multi-State Shale Research Collaborative

The Multi-State Shale Research Collaborative (MSSRC) brings together independent, nonpartisan research and policy organizations in New York, Ohio, Pennsylvania, Virginia, and West Virginia to monitor employment trends, tax policy, economic development, and the community impacts of energy extraction in the Marcellus and Utica Shale. As part of this effort, the Collaborative conducts in-depth research and interviews in order to produce trend analyses, policy recommendations, and other resources that will help local officials and community leaders respond to the local impacts of drilling. Member organizations include the Fiscal Policy Institute (FPI) (New York), Policy Matters Ohio (PMO), Keystone Research Center/ Pennsylvania Budget and Policy Center (KRC/PBPC), The Commonwealth Institute (TCI) for Fiscal Analysis (Virginia), and West Virginia Center on Budget and Policy (WVCBP).

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Introduction

This handbook provides recommendations to county and local governments, human and social services, police and emergency services, and other local officials dealing with unconventional gas drilling. These recommendations are based on previous research conducted by the Multi-State Shale Research Collaborative (MSSRC) to document the human and social service impacts of increased drilling.

The MSSRC brings together non-partisan, independent research and policy organizations from Pennsylvania, West Virginia, Ohio, New York and Virginia¹ to monitor trends in employment, tax policy and community impacts from unconventional gas drilling. Prior research focused on the impact on jobs of drilling in six states;² case studies of four counties in West Virginia, Ohio and Pennsylvania;³ and the human and social service impacts across these three states.⁴ Throughout this report, we pull from lessons learned from these studies, especially information we gathered from our case study counties — Tioga and Greene counties, Pennsylvania; Wetzel County, West Virginia; and Carroll County, Ohio.

Gas Development Life Cycle

There are three phases to the development and production of natural gas, each of which has its own distinct effect on local socioeconomics.⁵ The first stage of gas drilling is development. This stage is labor-intensive as gas companies search for land titles and sub-surface mineral rights and prep the land and roads for drilling. After land is found and leases are signed, companies send in or contract with workers to conduct seismic testing, expand roads, build well pads, drill wells and construct pipelines and compressor stations. During the development phase, communities experience a large influx of landmen, construction and drill workers, along with increased truck traffic and construction activity. Hotels and rental units begin to fill up, restaurants become more crowded and traffic increases on previously lightly travelled roads.

The second stage of gas drilling is production. Once the drillers have fracked the wells, gas begins to flow into pipelines to be transported to market. Far fewer workers remain to maintain the gas wells and manage production waste and wastewater.

The third phase is post-production. The average life span of a gas well is 40 years, although the amount of gas produced tapers off after the first three-to-five years of drilling. In the post-production phase, gas companies remove machinery, plug the wells and restore the sites.⁶

After the initial production, local communities may need to be prepared for waves of intense drilling activity followed by lulls. Drillers may re-frack wells to boost and extend production, and the vast, but deeper Utica formation is only in the early phases of development. Drilling activity is also affected by the price of natural gas – as prices fall, drilling activity falls off. But price increases will likely spur a spate of new development.

The following recommendations are for communities and local governments that are already responding to gas drilling within their borders or are expecting such activity. It is in no way an endorsement of the expansion of unconventional gas drilling. With proper anticipation, planning and adoption of best practices, local governments can mitigate the negative impacts of a gas boom and eventual bust. We focus on the economic, human and social service impacts of gas drilling and do not address potential environmental or health impacts (except for highlighting below the need to monitor public health impacts).

¹ Pennsylvania Budget and Policy Center, West Virginia Center for Budget and Policy, Ohio Matters, Fiscal Policy New York, The Commonwealth Institute Virginia
² Mauro et al. 2013.
⁴ Price et al. 2014.
Local Government Administration and Operations

Gas booms can strain the capacity of local infrastructure, housing stock and schools, and greatly increase the demand for social services, emergency services, and policing. In several of our case studies we found that governmental departments were not prepared for the demands that gas drilling created and, therefore, were unable to adequately respond. Local officials should seek out and provide their agencies and departments with training and education about the potential impacts of intensive drilling activity to help develop timely and appropriate responses and accommodations.

Modernize the County Recorder of Deeds Office

Most county recorders of deeds offices (or county clerks or registers of deeds as they are known in some states) are unprepared for the sharp increase in activity from the influx of landmen seeking land titles and deeds. Landmen are representatives of gas companies who are sent to buy or lease sub-surface mineral rights from local landowners. County recorders of deeds are tasked with keeping public records of all real estate transactions. County recorders of deeds offices not only have valuable information for gas drillers trying to sign leases in the county, but they also hold the records of gas leases once they are signed and official. One of the first signs of a gas boom is the influx of landmen who begin to flood a county recorder of deeds office to search land titles and deeds for information on who holds ownership of mineral rights throughout the county. This initial research on deeds serves as the basis for landmen to approach landowners with the goal of signing leases that allow companies to drill.

Digitize the county deed registry.

In certain cases (e.g., Carroll County, Ohio, and Tioga County, Pennsylvania), companies will pay to digitize the records as it makes their research easier. As soon as counties recognize the arrival of the landmen, counties should communicate their technology needs to the companies. If resources are available, counties can transfer documents to an electronic format, set up an aggressive preservation program to prevent damage to existing paper records, and increase their internet bandwidth to accommodate demand from more users.

Maintain updated lease maps in an electronic, searchable format.

To make it easy for citizens to access the names of landowners, leaseholders and the location of gas wells, counties should digitize lease maps and maintain them in a searchable database. Examples of digitized maps can be found at FracTracker.org.

Set up guidelines for access to county records.

Wetzel County, West Virginia, officials established strict guidelines governing access to county records in order to handle the increased activity.

Charge user fees for non-residents searching for deeds.

This will raise money to cover the cost of increased demand on the county recorder of deeds office.

Create a Single Point of Contact for the Drilling Industry

The MSSRC case studies revealed a common pattern – when the gas industry moved into a region, county and local governments were unprepared, had little knowledge of companies’ plans and were mostly unable to mobilize needed resources and respond quickly. Communications between local governments and the industry were often limited, especially where siting authority and permitting rests at the state level. There are early indicators that, if recognized, can give local government time to plan and prepare. For example,

7 Greene County is one of eight counties in Pennsylvania that has a searchable database of land records available at https://pa.uslandrecords.com/palr2/PalrApp/index.jsp. (The Greene County database goes back historically much further than other counties, to records generated after Sept. 30, 1939)
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if county recorders of deeds recognize a sharp uptick in deed searches by landmen to identify mineral rights, they should inform local elected officials and planning authorities.

County officials should act early to identify for the gas companies a government office, such as the county planning office, to serve as a single point of contact. This office should be charged with creating communication processes and mechanisms for companies to share drilling and construction plans with local municipalities and county governments. Taking a proactive approach will help minimize conflicts between local government plans and projects and gas drilling activities.  

Update Zoning, Subdivision, and Other Land Use Ordinances

All three of the major Marcellus gas-producing states, Ohio, West Virginia, and Pennsylvania, regulate the technical standards and pollution control aspects of gas drilling at the state level, and those regulations prohibit local governments from imposing their own environmental or technical regulations on drilling. None of these states allow local government to impose drilling bans in their communities. In all three states lawsuits challenging local ordinances that either allow or restrict drilling have been brought by the industry and citizen and environmental organizations. In these cases, the courts are determining the extent of local government power to impose restrictions aimed at managing the surface impacts of drilling to protect public safety and property values from the negative impacts of gas drilling.

Despite the unsettled law, the courts have determined that local governments have some ability to regulate the surface impacts of gas drilling through the exercise of zoning powers. Local governments should adopt zoning ordinances to the extent allowed by state law to have some control over where gas drilling takes place within their borders. In most places, local governments have the legal ability to restrict gas drilling to industrial or other appropriate zones and to direct gas development away from residential areas, schools and other sensitive community assets. In some states, municipalities can require screening and mitigation of noise, regulate use of lights and take other measures to protect public health and safety and property values.

Local governments should also update Subdivision and Land Ordinances (SALDOs) to make sure they adequately address temporary housing development, such as the expansion of RV parks and campgrounds. Without adequate regulation, RV parks might expand beyond their capacity, causing sewage and public safety problems.

In many states, state law and regulations wholly or partly pre-empt local gas drilling regulations, particularly those that address the technical requirements of well construction, waste handling, chemical storage, air emissions and other environmental protection issues. These pre-emptions ensure that local governments have some ability to regulate the surface impacts of gas drilling through the exercise of zoning powers. Local governments should adopt zoning ordinances to the extent allowed by state law to have some control over where gas drilling takes place within their borders. In most places, local governments have the legal ability to restrict gas drilling to industrial or other appropriate zones and to direct gas development away from residential areas, schools and other sensitive community assets. In some states, municipalities can require screening and mitigation of noise, regulate use of lights and take other measures to protect public health and safety and property values.

Lessons from the research:

“They parachuted in and we chased them around.”

Tioga County, PA, government official

Lessons from the research:

In Tioga and Greene counties, Pennsylvania, RV parks were not adequately regulated in the Subdivision and Land Ordinance (SALDO) at the county-level, and only some municipalities had zoning laws established. Because of the lack of clear zoning codes, some RVs cropped up in people’s yards, and some existing RV parks expanded.

8 Ward et al. 2014.
9 Ward et al. 2014.
10 Herzenberg et al. 2014.
that all drillers adhere to statewide public health and environmental protection standards. However, in some states, local governments can use their zoning powers to limit siting, noise, light, traffic and other local impacts, and some may even have the power to enact drilling bans (but not in Ohio, Pennsylvania and West Virginia). (The moratorium on drilling in eastern Pennsylvania is the result of the multi-state Delaware River Basin Commission not action by a Pennsylvania local government.). Local governments must understand the limits pre-emption places on their ability to regulate gas drilling and also understand and implement the tools they do have to protect public health and safety and property.

Establish Strong Communications Channels and Information-Sharing Among Government Departments, Municipalities and the Public

_Establish regular inter-departmental communication._
Impacts from gas-drilling activity may initially occur on local roads as truck traffic increases, and police and emergency services may see related impacts. School bus schedules may conflict with increased truck traffic on the roads, leading to difficulty getting kids safely to and from school on time. Ongoing communication among departments that deal with roads, schools, housing, police, emergency services, social services and county planning will give everyone a heads-up on all the related impacts of gas-drilling activity. Regular meetings among department heads can be important opportunities for county officials to share information and develop appropriate responses.

_Establish regular communications between county and municipal governments._
County and municipal governments need to share information about county-wide problems and responses and specific localized impacts of gas drilling. Information-sharing is key to getting an understanding of the scale of new demands on infrastructure and government services.

Create a drilling task force or commission
so industry, local government and citizens can share information about drilling plans, voice concerns and address problems. Some counties in the shale basin have created government-sanctioned advisory panels, task forces or commissions that bring together representatives from the gas industry, government, business, leaseholders, community organizations and others to share information, inform planning, and address concerns. Meetings should be regularly scheduled and open to the public and the media.

Monitor impacts of gas drilling on the local economy, infrastructure, social and human services, housing, and public health.

Headwaters Economics, an independent, non-profit research organization, recommends that local governments monitor five categories: (1) population growth and worker residency patterns; (2) employment, personal income and local business effects; (3) cost of living and housing, (4) service demands, infrastructure, capacity and revenue; and, (5) quality of life, recreational and environmental impacts.

Substantial data needed to track these variables are available through state and federal government agencies, but some data will need to be collected locally. If resources allow, it may be wise to hire a consultant to develop a monitoring system. Once in place, ongoing monitoring can be carried out by an appropriate local agency such as a planning office.

11 Headwaters Economics. 2014.
When setting up a monitoring program it is important to develop clear goals and identify adequate funding. Monitoring should begin early and continue even if drilling activity wanes. Engaging the public and making the monitoring program fully transparent will aid in the collection and acceptance of the data and build public support for subsequent actions based on the information.

Reports should be shared widely with government departments, schools, police and emergency services so they can plan accordingly.

See warning signs on public health.
In drilling communities to date, there is little systematic monitoring of public health impacts of gas drilling. A growing number of studies have identified worrying patterns. A University of Pennsylvania study documented increased hospitalizations for cardiovascular events as the number and density of gas wells increased. A University of Pittsburgh study found an increase in low-birth-weight babies among women who live near gas wells. In Colorado, a study found an association between women's proximity to gas wells and increased risk for giving birth to babies with certain defects. The Concerned Health Professionals of New York have assembled a compendium that includes many other reports of health problems.

The American Public Health Association recommends that communities where intense gas drilling occurs should build... "public health capacity to monitor, regulate, and respond to HVHF (High Volume Hydraulic Fracturing) in local communities: The public health workforce should be better educated about natural gas development and its potential for public health impacts. Particularly, those local public health agencies in areas of active natural gas development should receive adequate resources to support education, outreach, surveillance and monitoring, needs assessment, and prevention activities related to natural gas extraction."

Develop Sustainable Economic Development Plans to Mitigate the Inevitable Gas Bust
An economy that relies primarily on one industry is likely to under perform in the long run. Numerous studies of regions where extractive industries such as coal mining and oil and gas drilling dominate the economy have shown that those areas often fail to develop diversified, sustainable economies, leaving them vulnerable to boom and bust cycles. These regions under perform in total earnings, education levels, growth rates and personal income. They also have higher rates of poverty and greater income inequality.

County officials should recognize that gas drilling will not provide a good foundation for sustainable economic growth in their communities. Working with the appropriate public-private partners – such as local economic development agencies and business associations – local governments should develop and implement a sound strategy built on other local assets to recruit and retain businesses and industries not tied to gas drilling. Local governments should also advocate for the creation of a mineral trust fund from a portion of severance tax or impact fee revenue to provide the resources for economic diversification projects.

Workforce Development and Employment
The gas industry provides new jobs to a region, but not as many as the oil and gas industry and those with an economic interest in the expansion of drilling have claimed. Counties experiencing a gas boom will likely

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12  http://www.uphs.upenn.edu/news/News_Releases/2015/07/panetteri/
13  http://www.upmc.com/media/NewsReleases/2015/Pages/plos-one.aspx
14  http://ehp.niehs.nih.gov/1306722/
17  O’Leary and Boettner 2011.
18  Price et al. 2013.
see some short-term increases in job opportunities. These can include some jobs with the drilling companies (although many out-of-state workers stay with the rigs as they move, due to their knowledge of the machinery), and for truck drivers, welders and construction workers. Other job opportunities include service positions, for example in hotels and restaurants, which may get more business during the pre-drilling and drilling period. Expanded job opportunities tend to be primarily concentrated in the development stage of drilling, as landmen flood the region, roads and well pads are constructed, and wells are drilled. Once a well has been constructed and is producing gas, it requires fewer workers.

Workforce training for gas industry jobs should focus on getting workers ready for industry-related jobs as quickly as possible, but other workforce training programs should be maintained. Training for the local workforce should concentrate on gas industry service providers, such as welders, truck drivers and construction workers. Because the jump in job opportunities related to gas drilling may be short-lived, workforce development training should complement efforts to diversify the local economy so that skilled workers who leave existing local jobs for gas industry positions have non-gas opportunities should they need them.

**Housing**

Gas booms bring an influx of out-of-state workers — landmen, construction workers, truckers and drillers — who need a place to lay their heads at night. These workers often have more money in hand than many locals because many drilling companies pay housing per diems. However, gas drilling can result a drop in home values for properties located within 1.5 kilometers (0.6 miles) that rely on well water (see footnote 26).

Gas booms from the Dakotas to rural Pennsylvania have had significant impacts on local housing markets. Rents rise. Housing shortages worsen. Hotels fill up, sometimes for a full year in advance. The owner-occupied housing market gets tighter. Some landlords kick out current tenants, increase prices and rent single-family homes or apartments to multiple workers. Campgrounds and trailer parks make room for more tenants.

Housing shortages and rising prices can hit low-income, the elderly, and other vulnerable populations especially hard. Housing crunches can lead to a rise in homelessness and the need for temporary shelter and affordable housing assistance, putting a particular strain on local homeless shelters and human service agencies.

**Lessons from the research:**

In Greene County, PA, costs for foster care increased because families had to be separated as a result of inadequate housing. This broke up families while draining social service funds.

**Encourage the creation of temporary housing.**

Because the development stage of unconventional gas drilling may be temporary, investing in permanent housing construction may not be the wisest long-term use of funds. However, temporary housing options must be available to avoid the displacement of local residents and a county-wide housing shortage during a gas boom. In many natural resource-rich regions, man-camps — temporary housing for field workers — near the drill rigs, are a reasonable alternative if implemented correctly with adequate regulations.
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Local governments can identify appropriate sites for man-camps, including the expansion of existing RV parks and camp sites.\(^{19}\)

Local governments can use regulations, including subdivision approvals and building permits, to ensure appropriate siting and safety of temporary housing developments such as manufactured home parks, campgrounds and man camps. State regulations usually cover sewer and water requirements.\(^{20}\)

Local governments should be aware of potential problems at man-camps, including noise, and incidences of drinking and disorderly conduct, which may require police responses. Work with industry representatives to come up with rules for camps and to ensure that police or security services are prepared to respond to problems.\(^{21}\)

**Anticipate greater demand for Section 8 housing assistance.**

Local governments should review the status of their housing assistance programs to identify and address limitations. These might include an inadequate allocation of housing assistance vouchers, an inadequate stock of units that meet HUD standards, landlords refusing to accept vouchers when they can get higher rents, and program inefficiencies.\(^{22}\) As counties seek to bolster their housing assistance programs, they should create incentives for Section 8 landlords to stay in the program and educate them about the cyclical nature of the drilling industry. County programs should also provide assistance to landlords to bring properties up to HUD standards to expand the available Section 8 housing stock.

**Prepare for an increase in homelessness.**

A convergence of circumstances – rising rents, lack of alternative affordable housing, inadequate assistance programs – can result in a spike in the number of homeless families. Children in families without the means to provide adequate housing may end up in foster care. To manage these ripple effects, regular interdepartmental communications between housing agencies and child welfare agencies should be established. Counties should proactively increase the number of homeless shelters and amount of temporary housing and prepare social services agencies for increased caseloads.\(^{23}\)

**Renovate blighted houses and invest in senior housing to increase the affordable housing stock.**

Counties should inventory their blighted properties and apply for state, federal and private sources of funding to finance the rehabilitation of these properties and construction of affordable new housing for seniors and persons with disabilities.

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Lessons from the research:

Pennsylvania's drilling communities can apply for funding from the Pennsylvania Housing Affordability and Enhancement Fund to expand the stock of affordable housing and housing for seniors, disabled persons and transitional housing.

Lessons from the research:

In Greene County, PA, all of the local hotels filled up with gas drillers. During weather, fire or other emergencies, county officials had to look elsewhere, in nearby counties and states, for alternative emergency shelters.

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\(^{19}\) Ward et al. 2014.

\(^{20}\) More information on Ohio's regulations for man-camps and campgrounds can be found here: Ohio Environmental Protection Agency and Ohio Department of Health. 2012. "Guidance for Temporary Housing Associated with Oil and Natural Gas Drilling Operations. Ohio EPA. May 2012.

\(^{21}\) Dahl et al. 2010.

\(^{22}\) Herzenberg et al. 2014

\(^{23}\) Herzenberg et al., 2014.
no tax on their local hotel stays. Similar hotel tax exemptions exist in Pennsylvania (after a 30-day stay),24 New
York (90 days)25 and Virginia (90 days).

Anticipate a drop in property tax revenue from homes located near gas wells.
A Duke University study26 found that homes located within 1.5 kilometers (0.6 miles) of a gas well that rely on
well water dropped an average of $30,167 in value. Properties that received piped water slightly rose in value,
but went down if they were located in sight of a gas well.

Roads and Traffic

Gas drilling generates thousands of heavy-truck trips. Each well site requires between 890 and 1,340 truckloads
of gravel, water, chemicals, sand, construction supplies and wastewater removal.27 Truck traffic is especially
intense in the weeks and months leading up to and immediately after the hydraulic fracture, due to the millions
of gallons of water and liquid that drillers need for each frack.28 Because of truck weight, 364 water-truck trips
equals an estimated 3.5 million car trips. Most roads in small towns and rural counties were not built for intense
heavy-truck traffic.

The volume of heavy-truck traffic can create a number of problems: road damage that compromises safety,
increases in traffic accidents and fatalities, and traffic jams that make it more difficult for local residents to get
where they need to go.

Municipal road restrictions must meet certain legal
standards and must apply to all the vehicles in the
category being regulated. They cannot single out trucks
associated with gas drilling, but must apply to all trucks.
Local officials must demonstrate that the restrictions are
reasonable and necessary, and they should be backed
up with traffic and road condition studies.29

Below are a number of recommendations to help
communities prepare for increased traffic and
anticipated road damage and to manage other gas-
drilling-related traffic and road impacts.

Increase budgets for traffic control, safety improvements, and emergency responses.
Increased truck traffic can add unexpected costs to state and local government budgets. The costs of
installation of additional traffic lights and signs to improve traffic flow, repairs of damage to roads and bridges,
emergency responses to traffic accidents and provision of road escorts for oversized vehicles all strain tight
local government coffers.

Post weight limits and bond roads.
Before fleets of heavy trucks begin rolling down local roads, local governments should post appropriate weight
limits and require drilling companies to obtain road permits and post road repair bonds. Posting weight limits
on roads allows local authorities to steer heavy trucks onto roads that can handle their weight. Anticipate
non-compliance, and encourage local residents to help with enforcement by calling authorities when they see
oversized trucks using posted roads. Bonds ensure that counties and municipalities will have the funds to fix
roads in case companies refuse or delay repairs with disputes over which company is responsible.

24 Ward et al. 2014.
26 Muehlenbachs et al. 2015.
28 NYT Consultants, 2009
Increasing required bond amounts and negotiating road maintenance agreements can help ensure that local governments aren’t left paying for damaged roads. Sometimes road bonds are not enough to fix the damage. For example, in Pennsylvania the set road bond is $12,500 per mile, which is not enough to complete most repair projects.\textsuperscript{30} PennDOT Deputy Secretary for Highway Administration Scott Christie testified that bonds typically cover only 10-20 percent of the costs when users refuse to make needed repairs.\textsuperscript{31}

**Invest in a weight machine.**
Enforcement of weight limits on roads and bridges requires the use of a weight machine. A weight machine costs about $10,000, but it will pay for itself after several fines have been issued.\textsuperscript{32} States should provide this funding, or funds should be allocated from severance taxes/impact fees for the initial cost of the machines.

**Establish road maintenance agreements.**
Road Use and Maintenance Agreements (RUMAs) are agreements between county or township governments and oil and gas companies. They spell out the responsibilities of the companies to upgrade, fix and maintain the roads they use for gas drilling. A RUMA can include: requirements for road improvements to be made before heavy truck use, periodic maintenance and damage reports;\textsuperscript{33} a defined route from state roads to the well pad; bonding unless the road can be shown to withstand the expected truck traffic; maintenance of the route during drill activity; videotaping of the route prior to drilling activity; notification to the railroad industry if railroad crossing is involved; and any other provisions that the county or township mandates.\textsuperscript{34}

**Lessons from the research:** In Ohio, the state departments of Transportation and Natural Resources worked together to require a RUMA prior to permitting a horizontal drilling well. The RUMA ensures that there is a plan in place that reduces uncertainty around maintenance of the roads, and gives counties important information on drilling and road use so they can more effectively plan.

**Expand hazard training and increase police and EMS staff.**
With the increase of heavy truck traffic and more cars on the road, traffic incidents and accidents are also likely to increase. In previous research, the MSSRC found that in heavily drilled counties, there was an increase of 27.8 percent in truck-involved motor vehicle fatalities.\textsuperscript{35}

**Prohibit truck parking on public roadways.**
Work with the drilling companies to ensure that well pads are big enough to have water and sand trucks park on the pad instead of on the public roadways. To encourage cooperation, prohibit truck parking on the public roadways near drill sites to avoid backups and road blockages.\textsuperscript{36}

**Require wide-load vehicles to hire their own escort cars or give advanced notice if they need a police escort.**
To avoid having police called away from other duties to respond to last-minute calls for police escorts, require companies to give local police departments advanced notice and to seek permission for wide-load trips.\textsuperscript{37}

\begin{thebibliography}{99}
\bibitem{30} Ward et al. 2014.
\bibitem{31} Christie, 2010.
\bibitem{32} Herzenberg et al. 2014.
\bibitem{33} Ward et al. 2014.
\bibitem{34} Woodrum et al. 2014.
\bibitem{35} Price et al., 2014.
\bibitem{36} Ward et al. 2014.
\bibitem{37} Herzenberg et al. 2014.
\end{thebibliography}
Increase crossing guards at major intersections during high-traffic times.
Strategically placing crossing guards at intersections that have high-vehicle and pedestrian traffic will help provide a safer environment.

Enforce speed limits.
Independent truck drivers (and others paid by the mile) may have a tendency to speed to maximize the number of paying trips they can make in a day. Consistently enforce speed limits to enhance road safety for other motorists and pedestrians on the roads.

Designate truck routes.
Minimize damage to roads by designating truck routes on the strongest sections of local roadways. Weight limits must be based on the structural strength of the road and not just on arbitrary weights.

Designate no-drive times for heavy trucks, coordinated with school-bus schedules.
To avoid children arriving late to school and home because of the truck traffic on the roads, restrict truck driving during school-bus hours.38

Police and Emergency Services

Gas drilling brings an influx of young, transient men with extra cash in their pockets into quiet, rural communities. Studies have found a link between gas booms and increased crime and demand for emergency services.39

In heavy drilling areas where crime, DUIs, calls to police, and traffic incidents are on the rise, counties and townships need to beef up the staffs of their emergency services and police departments in order to effectively deal with increased workloads.

Because emergency services personnel will be required to respond to more traffic accidents and incidents at drilling and associated infrastructure sites, equipment and communications capacities may need to be upgraded.

Require drilling companies to create unique addresses for their gas well sites, and provide GPS coordinates and clear directions for emergency services personnel.
In order for police and fire and emergency services to quickly and effectively respond to well pad accidents such as spills, fires or injuries, they need to have an address and clear directions to well sites.

Lessons from the research: In high-drilling counties, violent crime increased 17.7 percent, property crime increased by 10.8 percent and DUIs increased 65 percent (compared to a 42 percent increase in non-drilling rural areas). An increase in crime led to an increase in the number of inmates in county jails. In Tioga County, PA, criminal cases jumped 25 percent between 2010 and 2011. In Cumberland Township, which has the greatest concentration of producing gas wells in Greene county, PA, the number of calls to police doubled between 2008 and 2010 (from 1,549 in 2008 to 3,086 in 2011). In Carroll County, OH, calls to the sheriff quadrupled and reported traffic accidents doubled after gas drilling began.

38 Herzenberg et al. 2014.
Provide additional training for EMS workers to deal with potential gas-drilling accidents and increases in vehicle accidents.

If gas drilling is new to a county or region, emergency services personnel will likely not know the language, processes or potential work-related accidents associated with the industry.

Emergency services directors should bring in experts to train personnel on the gas-drilling process and pipeline and compressor station safety. Training should cover the kinds of injuries that occur at drill sites, hazards such as spills and fires, hazardous materials procedures, the need for personal protective gear, etc.

Increase the Paid and Volunteer Firefighter and EMS Staffs.

The number of paid and volunteer EMS staff and firefighters may go down at the height of the gas boom due to an increase in job opportunities in the gas industry, leaving those departments understaffed and less experienced. Local governments should implement volunteer recruitment campaigns.40

Prepare local police to deal with an increase in crime and calls for service.

Local police may have to deal with an increase in assaults, DUls, bar fights, domestic disputes, sexual assaults, larceny and thefts, speeding and dangerous driving. Police should plan for this additional demand by increasing the number of officers on duty during evening hours when alcohol-related incidents are most likely to happen. Some counties experienced a rise in sexual assaults due to the influx of single, transient men to the region. Police should be trained on how to best deal with incidents of sexual assault and should be aware of the services available in the county to help victims.

Schools and Social Services

Increases in population, an influx of transient workers, and changes in the local economy can present challenges for public schools. Impacts on schools can include an increase in Latino students and a growing need for English as a Second Language services; an increase in transient students, an increase in the need for special education services; a decline in low-income students as parents relocate because of higher housing costs; an increase in high school drop-outs as high school students seek high-paying jobs connected to the gas industry; school bus delays due to increases in traffic; and difficulty in attracting and retaining school staff due to higher housing prices.

Gas drilling can be particularly hard on the poor, who do not benefit from royalties or increased income, but who feel the effects of higher rents and shortages of affordable housing. Social service impacts may include an increase in requests for child-care subsidies, early intervention services and housing assistance.

Conduct training for school officials on potential impacts of gas drilling on schools.

With advanced warning of potential impacts, school officials can put plans in place for dealing with potential impacts, such as an increase in ESL students, a need for more special education teachers, or an increase in high school drop-outs. Prior awareness of potential problems with school buses and increased traffic can lead to quicker resolution when incidents occur.

40 For tips see - http://www.firefighternation.com/article/professional-development/tips-recruiting-new-generation

Lessons from the research: In Tioga County, PA, the number of volunteers available to help in emergency situations decreased with the gas boom, while the need for response increased. Even paid emergency dispatchers left in search of higher paying jobs.
Conduct training for social services staff on potential impacts of gas drilling and how this may impact their programs. Invite experts to come in, including social services directors from heavily drilled counties, to discuss impacts they have seen. The more informed are social services staff, the easier it will be for them to anticipate new demands and plan and prepare for increased services. States should assist and provide resources to address social service needs.

Facilitate ongoing communication between social services departments and schools.
Strong communication systems between social service departments and schools can enhance planning and lessen problems. For example, increased requests at county social services agencies for early intervention services for young children may signal to a school district that more children may require special education services once they enter kindergarten.

Engage and Educate the Public

Educate Landowners about the Gas-Drilling Industry

Gas-drilling companies offer landowners lease deals that may include a one-time signing bonus and lease and royalty payments for the gas extracted from their land.

When drilling first starts in an area, most landowners will have little knowledge of the gas-drilling process and its opportunities and risks. Early on, landowners are often quick to jump at the first offer to lease their land because they are unaware of how valuable the gas under their land really is.

Royalty rates are based on the amount of gas produced from each well. Federal law requires a minimum of 12.5 percent for royalties, and states can set their own statutory minimum that companies must pay landowners. While there is a minimum payment required, landowners can negotiate better deals. In some cases, companies have deducted excessive transportation and processing costs from royalty payments.

Local governments can organize landowner education sessions and bring in experts from university extension services and attorneys who specialize in oil and gas leasing.

Provide public education about landowner rights and the opportunities/risks of signing leases.
Local governments can organize and conduct public education sessions to inform landowners about the process of gas drilling, negotiating a lease, the laws surrounding royalty payments and, in states where this applies, mandatory pooling rules. Local landowners will benefit from more information so they can make more informed decisions after weighing the benefits and risks.

Educate surface owners about their rights.
An individual who owns the surface rights to a property may or may not own the mineral rights underneath the property. In some parts of the country, land rights include the surface, mineral, and water rights. But in areas where drilling and mining have been more common, surface rights and mineral rights are sometimes separated. Gas companies need approval from the mineral rights owner, but must also negotiate with the surface rights owner in order to begin accessing the gas by constructing the well pad and drilling the well.

In many states, such as Pennsylvania, mineral rights trump surface rights, and surface owners who do not own mineral rights must allow drillers reasonable access to the gas even though they will not receive any compensation. Also in Pennsylvania, there is no requirement for drillers to come to any kind of agreement with surface owners that limits how they use the surface, including restrictions on location of the well pad, hours of operation, tree-cutting, etc.
**Encourage the formation of a landowner group/organization.**
Landowner groups can share information and experiences and organize when necessary. Lawyers can also read over leases to see if there are any hidden clauses that a landowner may overlook. States can provide support for landowner associations and legal services connected with negotiated leases.

**Build Civic Capacity**

Ongoing investment in social institutions should be a priority for local governments, states and foundations. Analysis of poverty-stricken towns found that the stronger a town’s civic culture, the easier it is for them to deal with economic or social crises or changes.\(^{41}\) Civic culture increases social capital, resulting in “widespread trust, inclusive participation, and long-standing investment in community organizations.”\(^{42}\) A stronger civic culture, within which individuals from all socioeconomic backgrounds from the community come together at church, social clubs, schools, etc., facilitates cross-pollination of social groups and provides a space for individuals to engage with each other about what is happening in their communities. This leads to more capacity to deal with many economic and social challenges including a gas boom and bust.

**Conclusion**

Hydrofracking technology has opened up shale deposits that underlie many parts of the country that were previously unavailable for development. The new accessibility of these sources of natural gas and oil has brought drilling to many places without (as well as some with) a history of extraction, most of them in rural areas where communities and local governments lack the capacity to deal with the intensely industrial character of unconventional drilling. Given the geographic extent of these deposits, especially the Marcellus and Utica shales, many communities will face the numerous changes drilling brings.

The recommendations in this handbook are based on the experiences of communities which have grappled with the disruptive changes that accompany the drillers and their rigs. As drilling technology changes and as drilling moves into new areas, there will be new challenges and lessons to be learned. We encourage local government officials to share their stories so that others may be better equipped to manage the changes generated by drilling.

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\(^{41}\) Duncan, 1999.

\(^{42}\) Duncan, 1999.
Works Cited


