Journal of Rural and Community Development

Using Shared Services to Mitigate Boomtown Impacts in the Bakken Shale Play: Resourcefulness or Over-adaptation?

Authors: Kristin K. Smith, Julia H. Haggerty, David L. Kay, & Roger Coupal

Citation:
Smith, K. K., Haggerty, J. H., Kay, D. L., Coupal, R. (2019). Using shared services to mitigate boomtown impacts in the Bakken Shale Play: Resourcefulness or over-adaptation? *The Journal of Rural and Community Development, 14*(2), 66–86.

Publisher:
Rural Development Institute, Brandon University.

Editor:
Dr. Doug Ramsey

ISSN: 1712-8277 © Journal of Rural and Community Development
www.jrcd.ca

Using Shared Services to Mitigate Boomtown Impacts in the Bakken Shale Play: Resourcefulness or Over-adaptation?

Kristin K. Smith
Montana State University
Bozeman, MT, United States
kristinsmith6@montana.edu

Julia H. Haggerty
Montana State University
Bozeman, MT, United States
julia.haggerty@montana.edu

David L. Kay
Cornell University
Ithaca, NY, United States
dlk2@cornell.edu

Roger Coupal
University of Wyoming
Laramie, WY, United States
coupal@uwyo.edu

Abstract

Unconventional oil and gas development frequently creates challenges for local government service provision and production. This case study unites research on shared services and energy impacts through a qualitative analysis of a suite of shared services experiments pursued in the context of the boom in unconventional oil and gas development in northwestern North Dakota, United States. The article examines how the unique circumstances of energy boomtown dynamics in remote and rural areas shape the feasibility and form of shared services as solutions to acute service provision crises. The findings demonstrate that communities can deploy substantial innovation in response to the shocks of an energy boom, complicating assumptions about social disruption and community passiveness. However, the use of shared services also reinforced unrealistic projections about the duration and long-term benefits of the boom. In some instances, the use of shared services enabled extravagant projects with questionable future sustainability.

Keywords: shared service, Bakken, shale, energy impacts, boomtown

1.0 Introduction

Energy boomtowns often exemplify local governments in crisis. During the Bakken boom in unconventional oil and gas (UOG) development the population of Watford City, North Dakota, increased over 300 percent. From 2000 to 2016, an estimated

4,300 residents and an unknown number of temporary oilfield workers flocked to this small county seat that previously had fewer than 1,500 residents. The influx stressed the city's infrastructure and services beyond capacity. Consultants estimated that Watford City needed over $193.6 million in 2012 in upgrades to its water, wastewater, and road infrastructure to meet service demand and accommodate the rapid growth (Vision West ND, 2012). The magnitude of the needs for this one city greatly exceeded available financial resources. For reference, the *entire* county's budget that year was just $53.4 million. Watford City's experience exemplifies familiar dilemmas in the boomtown impacts literature, particularly in rural regions like the Bakken (Gilmore, 1976; Guilliford, 1989).

Despite the obvious practical need for local government strategies to mitigate service impacts, the shared services and energy impacts scholarship have proceeded in isolation from one another. Previous research suggests that times of crisis can be leveraged into moments where new inter- and intra-government collaborations and shared services are possible (Alexander, 1995; Bryson, Crosby, & Stone, 2006; Kim, 2018). These arrangements may offer strategies for mitigating boom impacts. This article works to bridge the gap between the shared services and boomtown literatures by analyzing four examples of municipal development projects that reimagine service provision and production in two key hubs for the Bakken oil boom, Williston and Watford City, North Dakota. Whereas most research on shared services focuses on communities reacting to fiscal stress and/or declining populations, this case study expands the shared services literature into new geographies—specifically, the remote and rural boomtown.

The Bakken shale play has received relatively less academic research attention when compared to other regions that host unconventional oil and gas development, such as the Marcellus shale play (Walsh & Haggerty, 2019). Yet, the boom's impacts on services and infrastructure in the Bakken have been dramatic due to its relative remoteness and low population densities (Fernando & Cooley, 2016b; Haggerty, Kroepsch, Walsh, Smith, & Bowen, 2018b). This research therefore seeks to make three contributions to the scholarship at the nexus of the boomtown and shared services literatures: (1) To document how local governments mitigated impacts to their services in the Bakken shale play, (2) to draw connections between the boomtown and shared services literature with the goal of addressing gaps in both, and (3) to critique the use of shared services in the context of the rural, remote boomtown. The article begins with an overview of the shared services and boomtown literatures, followed by a description of the case study methods. Next, it offers an analysis of how local governments used shared services as solutions to short-term boom impacts and also as longer-term strategies to promote quality of life. It ends with a critique of these strategies and calls for future research into the use of shared services as a strategy for addressing rural boomtown impacts.

2.0 The Shared Services and Rural Boomtown Nexus

2.1 Shared services

The term shared services describes collaborations between a government entity and at least one or more other entities (government, non-profit, community organization, and/or private company) in the act of local government service production and/or provision (Morse & Abernathy, 2015). These strategies have become increasingly popular for rethinking service provision approaches (Blair & Janousek, 2013;

Warner, 2017), particularly during times of crisis—an economic recession, policy change, or service disruption (Alexander, 1995; Bryson, Crosby, & Stone, 2006). Much of the existing literature has been motivated by the potential for service sharing to create economic efficiencies, typically in response to fiscal stress (Bel & Warner, 2015, 2016; Jimenez & Hendrick, 2010; Raudla & Tavares, 2018).

Types of shared services range from informal 'handshake' agreements to formal contracts between and within governments (Benton, 2013; Blair & Janousek, 2013). The majority of research on shared services has focused on contracting out services to public or private entities (Bel & Warner, 2016; Morse & Abernathy, 2015). However, shared services take many forms. Examples include sharing personnel or equipment between governments and/or community organizations, co-locating departments in a common facility, creating services with joint operations between city and county governments, and consolidating departments into new joint entities, such as a fire tax district. Most shared services are negotiated *de novo* rather than from boilerplate and are thus tailored to address the local context and available resources (Hilvert & Swindell, 2013; Kim & Warner, 2016).

For rural regions, local governments' motivations for implementing shared services are often pragmatic. Rural governments face challenges with service production and provisioning due to limited capacities, higher costs stemming from low population densities and expansive coverage regions, and imperfect markets with limited competition (Brown & Schafft, 2011; Warner, 2006). Due to this "social cost of space" (Kraenzel, 1955, p. 201), shared service arrangements can allow governments to reorganize their services while avoiding politically unpopular decisions, such as full consolidation or dissolutions. Importantly, Delabbio and Zeemering (2013) highlight that not all governments are equally poised to implement shared services; local governments' abilities to collaborate with other entities are dependent on the community's institutional context, leadership capacity, and decision makers' comfort with risk, amongst other factors.

The shared services scholarship is often embedded within broader questions of the impacts of neoliberalism, austerity politics, and/or local government fragmentation. Studies have attributed the surge in shared service arrangements to a range of factors: devolved governance and/or decreased federal and state budgets (Bel, Hebdon, & Warner, 2018; Warner & Hefetz, 2009), political pressure for increased government efficiency and smaller governments (Benton, 2013; Delabbio & Zeemering, 2013), and fiscal stress stemming from recessions (Kim, 2018; Kim & Warner, 2016). Local governments may establish shared services to save money while maintaining or increasing service levels, improve decision-making capabilities, and/or strengthen their accountability to taxpayers (Benton, 2013; Zeemering & Delabbio, 2013). Shared services can also help unite previously disparate governing entities (Brenner, 2002) and strengthen social capital, such as by building trust or creating new possibilities for future collaboration through increased contact with co-workers (Morse & Abernathy, 2015; Linden, 2010).

While there is a general assumption that consolidation of services will allow local governments to capture economies of scale, emerging research complicates this belief (cf. Bel & Warner, 2016). In a longitudinal study of New York counties, Kay and Corrigan (2018) found that inter-municipal sharing did not lead to statistically significant cost savings in local governments, though they noted the collaborations may have resulted in other benefits beyond fiscal measurements. In a study of California cities that terminated interlocal contracts, Zeemering (2017) found that

the contracts were ended due to a perceived lack of local budget control, poor service levels, inadequate contract management, and insufficient community relationship management. Other challenges with inter-municipal cooperation include difficulties in monitoring partners, partner selection processes, declining service quality, and the complexity of regional coordination (Warner, 2017). To date, the shared services literature has largely ignored energy boom impacts to public services.

2.2 Energy Development Impacts on Services and Infrastructure

Beginning in the 1970s, in response to booms in industrial energy development, interest in studying boomtown effects soared (Smith, Krannich, & Hunter, 2001). These studies coalesced to form the social disruption model (also called the boomtown model) that described energy booms as "a mix of positive and negative economic impacts to local residents, contrasted with highly negative social impacts" (Jacquet, 2009, p. 8). Researchers attributed many of the boom's negative impacts, including degradations to quality of life, to the inability of local governments to manage skyrocketing demands on public services and infrastructure (e.g., Gilmore, 1976; Kohrs, 1974). The 'Shale Revolution' of the 2000s renewed research interest in analyzing the social impacts of energy development, with many researchers again noting the importance of addressing impacts to services and infrastructure (e.g., Jacquet & Kay, 2014; Measham, Fleming, & Schandl, 2016; Ruddell, 2017).

In the United States, the nature of UOG development in rural regions poses specific problems for public service production and provisioning. Due to the sprawling footprint of UOG development, a large labor force is needed to facilitate the boom. For rural geographies, this requires a massive in-migration of workers and a predictable set of impacts: housing shortages, traffic jams, rising labor and construction costs, and increased demands on water and wastewater systems, emergency services, schools, and hospitals (Haggerty et al., 2018b). While local governments will likely benefit financially from the boom due to increases in tax revenues and/or royalty or leasing payments, their expanded budgets are not always sufficient to cover costs for new and/or upgraded infrastructure and services (Newell & Raimi, 2018).

Rural regions are particularly vulnerable to boom and bust cycles due to their economic structure, the volatility of the oil industry, and the impacts of devolved governance (Haggerty et al., 2018b). Changes in global oil prices, for example, result in massive, unpredictable swings in oil activity at the local level. The corresponding increases and decreases in tax revenues and service demands create a challenging, hard-to-predict context for local government planning (Christopherson & Rightor, 2012; Keough 2015). The rapid pace of UOG development exacerbates challenges for successfully mitigating unwanted impacts and capturing potential benefits (Measham et al., 2016). Subsequently, local governments often address UOG impacts reactively as opposed to planning proactively for economic diversification, creating a risk of entrenching natural resource dependence (Freudenberg, 1992). Further, due to the devolvement of economic and community development responsibilities, local governments are forced to respond to the boom's rapid, cascading changes in service demand on their own—a steep task for any community (Haggerty, Smith, Mastel, Lapan, & Lachapelle, 2018c; Smith & Haggerty, 2018).

2.3 The Bakken Shale Play

The Bakken shale play has received less academic research attention than other shale plays (Walsh & Haggerty, 2019), despite the Bakken exemplifying the typical remote and rural boomtowns of the American West (Haggerty et al., 2018b). What social impacts research exists predominantly focuses on the social disruptions prompted by the Bakken boom, including increased crime and pressures on emergency service personnel (Dahle & Archbold, 2015; Ruddell, 2017), impacts on quality of life and how impacts vary by stakeholder group (Fernando & Cooley 2016a), and how the boom has shifted attitudes and/or perceptions towards UOG development (Fernando & Cooley, 2016b; Loder, 2016; McEvoy, Gilbertz, Anderson, Ormerod, & Bergmann 2017). Other research has focused on the fiscal challenges of the boom, including increasing debt loads from service and infrastructure investments (Newell & Raimi, 2018), as well as strategies that various stakeholders have taken to address negative impacts and leverage benefits (Haggerty et al, 2018c; Smith & Haggerty, 2018). Due to the extremity of the boom's impacts, both positive and negative, the region has attracted immense media attention, much of which focuses on the drama of the boom as opposed to offering nuanced analyses of how the boom has changed the region in the short- and long-term (Becker 2016; Rao, 2018).

Notably, the shared services scholarship has largely overlooked rural boomtowns, including those within the Bakken, with the exception of Hultquist, Harsell, Wood, and Flynn's (2017) research on the use of local government contracting in North Dakota. This study found that communities with higher oil and gas employment were more likely to provide services in-house than other communities with rapid growth. The authors hypothesized the finding was due to increases in revenues from UOG, rising costs of contract labor, and/or community leaders' beliefs that energy development would persist long-term, justifying in-house service production. Their research highlights the intersection of the boomtown and shared services literatures as a fruitful area of research. However, the authors stopped short of asking how the boom may prompt shared services and/or how shared services could be employed as a strategy to mitigate against undesired boomtown impacts. The interaction between rurality and boomtown dynamics shapes opportunities for shared services in ways that have not yet been studied.

3.0 Methods

3.1 Case Study Site: The Bakken Shale Play in Western North Dakota

From the mid-2000s to 2014, oil extraction from Bakken shale created a boom in UOG development in eastern Montana and western North Dakota (Haggerty et al, 2018b). The majority of UOG development occurred in four North Dakota counties: McKenzie, Mountrail, Dunn, and Williams. This case study focuses on two of the primary service hubs for the oil industry that experienced extensive boom impacts: Watford City (McKenzie County) and Williston (Williams County). Both McKenzie and Williams Counties experienced either stagnant or declining population growth for 25 years prior to the boom. When the boom began, Williston and Watford City experienced dramatic population growth. In response, local governments instigated efforts to expand their infrastructure and facilities as they struggled to meet demands on their public services. This study investigates four development projects that were built during the boom, as summarized in Table 1. Collectively, they illustrate a host

of collaborative strategies that local government leaders and/or community organizations pursued to mitigate boom impacts.

Table 1: *Shared Service Projects Built in Williston and Watford City during Boom*

Williston State College Foundation Apartments & DMV | Cost: $8.5 million | Completed: 2013
This 74-unit affordable housing complex was constructed for Williston State College staff and community essential services employees. The building serves as a joint facility that houses the Williston Motor Vehicle Office.
Wolf Run Village, Watford City | Cost: $6 million | Completed: 2013
The county, city, and school district collaborated to establish a 501(c)(3) nonprofit organization to build a 42-unit affordable housing complex for teachers and essential services employees. The project also included a daycare.
Williston Area Recreation Center (ARC) | Cost: $76 million | Completed: 2014
Similar to the Rough Rider Center (RRC), this is one of the largest municipally-owned recreation centers in the United States at 254,000 sq. ft. It was built on Williston State College land with significant resource sharing between the city and the college.
Rough Rider Center (RRC), Watford City | Cost: $92 million | Completed: 2016
At 268,000 sq. ft., this is one of the largest municipally-owned recreation centers in the United States. The Parks Board runs the RRC with significant resource sharing of employees and equipment between the local high school and other community organizations.

3.2 Data Collection and Analysis

The case study draws upon in-person interviews with 19 community leaders, including economic development professionals, local government representatives, and local and state government employees. The interviews occurred as part of a larger data collection effort during the summers of 2016 and 2017, a period of slowdown in oil and gas activity. Whereas existing scholarship tends to focus on the boom phase, the timing of this study helps address the gap in research on long-term impacts, as noted by Krannich (2017). Watford City and Williston were chosen as the research sites due to the extensive oil production within their vicinity and their roles as major service hubs for the oil industry.

The authors created the sample pool of interviewees by compiling a list of community leaders for McKenzie and Williams Counties and recruiting participants through email and phone calls. Nearly all contacted individuals agreed to be interviewed, and those who did not cited the heavy workloads that persisted post-boom. Interviews were in-depth, semi-structured, and conducted in person. The shortest interview lasted 39 minutes, the longest lasted 131 minutes, and the average

lasted 75 minutes. The interviews were recorded and then transcribed verbatim. The digital files were uploaded into Nvivo for coding and analysis.

During coding, the interviews were analyzed to understand the motivations community leaders revealed about their choices to implement shared services and the challenges they encountered. Codes were collapsed and expanded throughout the analysis process, which involved multiple readings, as well as comparisons and contrasts with findings from previous research (Charmaz, 2005; Lindlof & Taylor, 2011).

The projects were chosen based on input from the interviewees and the researchers' participant observations. The research began with an interest in economic development strategies. When the use of shared services arose as a recurring theme, the interviews shifted to explore shared services as a mitigation strategy for boom impacts. Community leaders identified these projects as examples of how their community reacted to the boom. The projects were extensively researched upon selection. Supplemental documents were collected and analyzed to triangulate findings, including news articles, testimony from the state legislature, and relevant board meeting minutes. The projects are not a comprehensive list of shared services within the region but rather examples of how two communities responded to perceived opportunities and/or needs prompted by the boom.

4.0 Findings: Shared Services and the Boom

The Bakken boom sparked new forms of shared services and institutional arrangements, albeit with different temporal, spatial, and economic dimensions. The first two projects highlighted in this case study represent solutions designed to mitigate against undesired but temporary boom impacts. The other two projects are larger investments designed to leverage the boom into longer-term quality of life improvements. Each project demonstrates attempts by local leaders to proactively engage with an unpredictable commodity cycle. This resourcefulness has roots in community leaders' previous experiences with boom and bust economies. Many of the interview participants remembered the depopulation, economic decline, and burden of large municipal debts that occurred after the 1980s oil boom. Community leaders repeatedly emphasized the need to extend savings to taxpayers and create efficiencies in service provision. As one leader explained with regards to government spending in the context of the boom, "I think people in northwest North Dakota have been and tried to be resourceful." This awareness and engagement with the boom-bust cycle align with recent boomtown findings that North Dakotans have "an attitude of wariness that pervades" with regards to community and economic development investments (Becker, 2016, p. 20). Given this awareness, community leaders created shared service strategies to address boom impacts with fiscal conservativism, though this goal was not always achieved.

As previous shared services research illustrates, the logistics of creating and maintaining partnerships are often complicated and time-intensive (e.g., Carr & Hawkins, 2013; Hefetz, Warner, & Vigoda-Gadot, 2012). When community leaders in Williston and Watford City were asked about the challenges of forming partnerships, many responded by emphasizing how much time they spent in community and organizational meetings. This case study focuses on the more unique challenges of creating shared services during an oil boom, but the time investment that the projects represent should not be underestimated. The following analysis describes how each project was created, the motivations for incorporating shared services, and the challenges encountered.

4.1 Shared Services as Mitigation Strategies to Temporary Boom Impacts

The shared services projects highlighted in this article are notable for their rapid formation and construction, reflective of the heightened pace of UOG development. The tremendous levels of in-migration associated with the build-up and boom phases of UOG development stressed local communities (Headwaters Economics, 2012) and, at times, forced on-the-fly decision making. The Williston State College Foundation's contract with the DMV and the Wolf Run Village in Watford City are both shared services that were created to address distinct boom impacts: the risk of the DMV closing in Williston and the lack of affordable housing and daycare in Watford City. Both projects were built during the height of the boom when impacts to services were the most acute.

4.1.1 Williston State College Foundation apartments and the DMV. The immediacy of the boom prompted unexpected collaborations. In response to housing shortages in Williston, the Williston State College Foundation assumed responsibility for building and managing an affordable housing complex, an atypical role for a college foundation. Even more surprising, the Foundation took over the management of the Williston Motor Vehicle Office when the North Dakota Department of Transportation (NDDOT) was unable to find another entity to run it. The Foundation built an office for the DMV in its affordable housing complex and managed its operations from 2011 to 2018.

The impetus behind the Foundation's decision to run the DMV offers important insights into how devolved governance compounds the impacts from UOG development. While many states have a singular DMV, North Dakota has two separate departments: the Driver's License Division and the Motor Vehicle Division (referred to in this article by its more common name, the DMV). While the Driver's License Division is run by the state, most of the Motor Vehicle Division offices are run by third-party operators, such as chamber of commerce branches, county offices, and private operators. Prior to the Bakken boom, the Williston Area Chamber of Commerce ran the DMV. In 2011, as UOG development intensified, the chamber decided to end its contract (Killelea, 2013), as it was not able to keep up with the spike in demand on its services. As an interviewee explained, "The chamber at the time had one or two employees. Then the boom hit. The lines were out into the street of people wanting to get titles, license renewals." No other entity was interested in running the DMV because of the challenges imposed by the boom, both the high demand on the office's services and the problem of finding employees given labor shortages.

The Williston State College Foundation agreed to run the DMV as an ad-hoc solution to an immediate need to keep it operating. One stakeholder involved with the project explained the origins of this shared service:

> So, we had a local legislator that I know quite well, and he called me and said, 'Do you think there's any way…the Foundation could house or manage the DMV while we're in this insane environment?'… So basically we worked with the state, Department of Transportation, our local legislators, and the college… we did it. The Foundation managed it. We housed in on the college campus, and we hired employees…

The shared service was enabled by the region's tight-knit social networks, in which a local legislator and a Foundation representative could begin to problem solve a boom impact via a phone call. This partnership also illustrates how devolved governance exacerbates boomtown problems. While third parties may be willing to run the DMV under normal circumstances, the boom decreased incentives for third-party operators. The NDDOT bid the DMV's management out multiple times but received no offers. Thus, the unexpected partnership between the Foundation and the DMV was due to the regulatory void created by North Dakota's outsourcing and privatization of its Motor Vehicle Division.

Importantly, the Foundation's management of the DMV was intentionally designed as a short-term contract. The DMV did not align with the Foundation's goals. As one organizer quipped, "None of us, including myself or the foundation board, really felt this was part of our mission." From the initiation of the shared services arrangement, the Foundation planned to end its management of the DMV by 2019. In 2018, the NDDOT again attempted to bid out the franchise to private industry and again did not receive any offers (Williston Board of City Commissioners, 2018). In response, Williams County agreed to take over the DMV's management. In the short-term, the DMV will continue to be housed in the Foundation's apartment building but is now run by the county government, creating a new iteration of the shared services arrangement. The partnership illustrates the potential for a boom to instigate unexpected but effective governance strategies to address impacts to services.

4.1.2 Wolf Run Village, Watford City. Community leaders' use of shared services transcended traditional department boundaries within local governments. The Wolf Run Village, an affordable housing complex in Watford City, demonstrates how the compounding impacts from the boom resulted in collaborative projects between different government sub-divisions. Researchers have noted that multi-organization, networked approaches like the Wolf Run Village can be effective strategies for addressing governance challenges in UOG boomtowns (Wilson, Morrison, Everingham, & McCarthy, 2017).

The Wolf Run Village was built as a solution to the housing and childcare shortages created by the boom. In Watford City, school enrollment increased 20-25% annually beginning in 2011. The school district needed more teachers and staff, but administrators struggled with recruitment. Prospective employees were skeptical of the city due to negative media portrayals of the boom, and there was a lack of affordable housing. The school district attempted to address the housing shortage by providing teachers with on-site trailers located next to the playground, but the living situation was not considered ideal. Meanwhile, city and county departments were experiencing similar challenges when recruiting government employees.

In response to perceived community needs, the city of Watford City, the school district, and the McKenzie County government collectively conducted a community assessment in 2011, and affordable housing and daycare emerged as priorities. The three entities then formed a new 501(c)(3) nonprofit organization to collaborate on building and managing the Wolf Run Village, an affordable housing complex for teachers and essential services staff that included an on-site daycare. The newly-formed joint organization was an important aspect of this project as it allowed the group to raise private funds and apply for state funding available to nonprofit organizations. The organization coordinated multiple entities who shared common needs and resulted in housing that could be used as an employee recruitment tool.

Similar to the DMV project, this collaboration was enabled by the tight-knit social structure of the small community. One interviewee explained that a core group of city, county, and school board representatives regularly met and communicated through formal community meetings and informally through social events. Additionally, stakeholders regularly described the city's leaders as "proactive" and "progressive," with the implication that their community has strong leadership capacity. They proudly noted that the city's former mayor, Brent Sanford, is now the Lieutenant Governor of North Dakota. Watford City residents' abilities to establish partnerships and leverage local resources have been celebrated by other researchers, such as by Flora and Flora (2016) in their seminal chapter on social capital. While the willingness for city, county, and school district representatives to work together is not unique to Watford City, the extent to which they collaborate is notable. This same group of leaders was also responsible for the formation of the Rough Rider Center's shared services, as will be discussed in the next section.

As the immediate impacts from the boom declined, community leaders' vision for the Wolf Run Village shifted. Initially, community leaders argued that public involvement in the housing and childcare sectors was necessary because the private sector was not sufficiently addressing regional needs. When interviewed in 2017, leaders noted that the private sector had caught up, at least with regards to housing availability. This led some leaders to rethink the government's involvement with the Wolf Run Village. As one leader explained, "Probably in the next couple years, easily, all three entities will no longer be in the housing game. We'll hand that back over to the private. People can get reasonable rent? Great! Served its purpose." Given the volatility of the UOG development, the willingness to end a shared service is potentially as important as the willingness to start a collaboration. Whether or not community leaders will actually be able to end their involvement by finding an interested buyer, however, is uncertain.

Although shared services have the potential to offer solutions to boom impacts, the volatility of oil development remains a substantial challenge to their long-term viability. On the one hand, the Wolf Run Village is an example of a shared service in which community leaders successfully reimagined their institutions to create a new approach to providing affordable housing and child care resources. However, the downturn in oil development that began in 2015 created financial problems for the apartment complex. As of 2017, the project was losing $30,000 – $50,000 per month and the county had to offer financial assistance to assist with debt payments (Shipman, 2018). This project exemplifies the distinctive challenges for creating shared services, particularly in the ongoing maintenance of the projects during slowdowns and busts. There is a substantial risk that communities will build projects that may become obsolete when development declines and/or lead to unsustainable debt loads. Even when local governments are willing to continually reimagine their services, the volatility of global markets may create constraints that are unsurmountable.

4.2 Shared Services as Long-term Development Strategies

The Williston Area Recreation Center (ARC) and the Rough Rider Center (RRC) in Watford City offer examples of local governments using shared services as long-term community and economic development strategies. In Williston, a quality of life committee helped plan the ARC, which was seen as "really a big piece of quality of life for people that moved here—a place to take your family…" A similar process

played out in the development of Watford City's RRC. A community leader noted that "we did a lot of community assessment… if we don't want to be a community where people blow in here and work for two weeks and then blow back to Denver, then what is it that make people want to live here?" Community leaders felt increasing local amenities and recreation facilities would support economic diversification. Similar strategies have been used in other communities with intensive energy development, such as Fort St. John, British Columbia (Markey, Halseth, Ryser, Argent, & Boron, 2019). These planning efforts emphasized quality of life with the subtext—at times implicit and at other times explicit—of attracting industry and retaining residents who had migrated to the region. However, they also tended towards the extravagant, creating a risk of increased municipal gross debt.

4.2.1 Williston Area Recreation Center (ARC). The Williston Area Recreation Center (the ARC) is the largest park district-owned recreation center in the United States (JLG Architects, n.d.). The ARC is located on land owned by the North Dakota Board of Higher Education, and its operations rely on extensive resource sharing between the Williston Parks and Recreation District (referred to hereafter as the Parks District) and Williston State College. The partnership was a result of the skyrocketing land prices in Williston, prompted by the boom, that made building a new recreation center prohibitively expensive for the city. As a solution, the College leased five acres of its land to the Parks District for $1 for 99 years and committed to paying an annual fee. In return, the College's students have access to the facilities and the College's employees and administration can use the public meeting rooms. The project involves ongoing negotiations between the entities. A Williston State College employee explained that the project's "…shared space, shared service, shared staff, shared equipment has kind of just evolved over time. And it keeps getting refined over time." This speaks to the Parks District's continuing reorganization of their services and to the constant innovation that the boom prompted within local governments.

The ARC demonstrates how the unique context of a UOG boom shapes shared service projects. Oil and gas development is exempt from property taxes in North Dakota, meaning that local governments' budgets primarily benefit from state allocations of severance taxes and upticks in sales tax revenues (Newell & Raimi, 2015). As UOG development surged, the Parks District decided to capitalize on the boom's increased economic activity by switching its funding source from a property tax, which saw only constrained growth due to UOG development's tax exemption, to a more lucrative sales tax. As argued by one Parks District employee, "The guy living at the hotel is not paying property tax, but he's still using the parks. So why is he not helping pay for things?" The downside of the switch, however, is that the fluctuations of UOG development result in highly unpredictable tax revenues (Raimi & Newell, 2016), as reflected in the Parks District's budget. Before the boom, the Parks District had an annual budget of roughly $1.9 million. In 2014, after the Parks District switched to being funded by a sales tax, its budget increased to $14.8 million, only to drop by 39.8% to $8.9 million in 2016. The ARC's reliance on a sales tax to repay its bonds introduced volatility into the project, a concern that would be less worrisome in communities with more predictable annual revenues.

While the ARC was designed to be a long-term investment in the community, it speaks to the risk of forming shared services in the boom context. The Parks District's original plan was to build a $36 million facility, but as its budget ballooned the board expanded the plan: "We got this funding, what do you want to do? We

want to get bigger…the original design didn't have a 50M pool in it, Olympic sized pool, didn't have a track in it, only three basketball courts, turf was not involved…" Since the Parks District had surplus revenues, the ARC was scaled up and would eventually cost $76 million. As the UOG development slowed and sales revenues plummeted, repaying the bond became challenging. The project's costs contributed to the city's growing debt, which was estimated at over $225 million as of September 2017 (Haffner, 2017). The ARC has been widely popular with community members. However, the use of shared services increased its size and costs, which directly contradicts the motivation that many community leaders describe for using shared services – to increase resourcefulness and fiscal efficiency.

4.2.2 The Rough Rider Center (RRC), Watford City. The Rough Rider Center (RRC) is a massive 268,000 square foot recreation and conference center that was built next to the new Watford City High School and includes athletic facilities originally proposed for the school. It represents a joint powers agreement between the City of Watford City, McKenzie County School District #1, and Watford City Parks and Recreation District. The project began as a discussion between the former mayor of Watford City, the city administrator, and the school superintendent. The city administrator recruited the Parks Board to manage the center's operations, and then the Parks Board collaborated with the city on the financing. When asked how the project originated, a community leader emphasized the importance of "open dialogue, letting other people know what the needs are out there" and then noted, "We all know each other. We all kind of travel in some of the same circles." Again, Watford City's tight social network proved to be an important enabler for this project.

The RRC is a unique shared service because it was designed as a workaround solution to help fund a new high school building that otherwise would have cost too much per student to be financed (Lee, 2016). According to school officials, the funding mismatch was due to a lag in population estimates. While the city's actual population may have been large enough to justify the school's projected costs, the outdated 'official' population statistics limited the amount community leaders could borrow. The failure of data to keep up with the boom's population growth was a commonly cited challenge for decision-makers and planners and has been noted elsewhere in the boomtown literature (e.g., Keough 2015). Community leaders proposed the RRC as a way to leverage additional funding sources—including loans backed by property and sales taxes and a distribution of the state's oil and gas taxes (Lee, 2016). Since the high school did not have the financing to build its own recreation facilities (e.g., football, baseball, and soccer fields), it was able to use the RRC's funding to fulfill and expand upon its original plan.

Similar to the ARC, however, the use of a sales tax proved to be a volatile funding mechanism. One interviewee explained, when the RRC was first proposed, "the gross production tax that the city was getting well covered the payments on the building." However, by 2017 the RRC had an $800,000 annual shortfall due to unanticipated decreases in revenues. A news article published in 2016 remarked that the RRC needed $200,000/month in sales tax revenues to cover bond expenses, but the city only brought in $112,321 in April of that year (Lee, 2016).

The RRC's financial troubles are related to its immense scale. Typically, governments that implement shared services in non-boom contexts must make hard compromises to ensure projects are in line with future budget projections. In

contrast, UOG development in Watford City promised new sources of tax revenues and hard compromises were seemingly not made. One community leader described how their collaborations with community organizations led to the RRC's massive size:

> In their planning, when they had talked to all these groups and what they wanted and everything else, that's kind of how it came about. Well, we need two sheets of ice. We need a fieldhouse or a big open space. We need an arena. Want the indoor pool. And the convention space. So they [the architects] started figuring, putting everything together – and voila!"

Notably, the RRC's collaboration with these community organizations unified their capital campaign projects and prevented them from competing against each other for donations. However, their participation also prompted the community to build an even larger complex, indicative of a lack of compromise during the planning phases.

Additionally, the dire need for a new high school to accommodate the growing population forced an accelerated schedule on the high school and the RRC building projects. As one county employee explained, "Most of the changes in the community take years and years of planning, but this was just such a boom that all these new things happened." He went on to say that with regards to the RRC they are still waiting "for the community to catch up and catch the vision." The lack of a vision could help explain why the Center is underutilized. Under normal circumstances, government leaders—presumably with input from the community—would decide the facility's role before construction. Instead, the Parks Board was forced to adopt an "if you build it, they will come" strategy. As one interviewee described, this has been an ongoing challenge:

> There's been a lot of growing pains. I mean it hasn't been an easy transition, you know. As you can see in the middle of an afternoon, we're the only two here. There's a few playing basketball…That's the other thing that we're… trying to figure out right now is really what do people want? What do you want us to offer?

The RRC helped to fund the high school, allowed collaboration between various community and government entities, and represented an investment in the community's long-term economic development. However, the project's gargantuan size prompts questions about whether it is a 'white elephant project.' Local leaders' ongoing struggles to define the RRC's purpose and its financial troubles raise questions about the viability of using shared services for long-term projects in the boom context.

5.0 Discussion

UOG booms in rural and remote geographies offer unique opportunities and challenges with regards to government planning for services. While many rural communities with manufacturing economies are experiencing steady population decline and shrinking tax bases, energy boomtowns often have the opposite problem

during the beginning of the boom: large influxes of workers stress government services and infrastructure beyond capacity (Measham et al., 2016). These increased demands on local governments combined with large increases in tax revenues lead to rippling booms in infrastructure development and service expansion. However, sharp downtowns in UOG development can trigger de-population, increasing the risk that the community will overbuild infrastructure and/or over-expand services. One strategy used in declining rural communities—shared service arrangements—may also be beneficial for energy boomtowns.

This research sought to address gaps in both the boomtown and shared services literatures, while documenting how local governments in two cities in the Bakken mitigated stresses to their services. Prior research suggests that shared services are often implemented to capture cost savings, capitalize on economies of scales, and maintain service levels (Kim & Warner, 2016). Other motivations include improving service quality (Bel & Warner, 2016) and/or appeasing calls for smaller governments (Benton, 2013; Zeemering & Delabbio, 2013). These motivations were also apparent within the shared services projects implemented in the context of a UOG boom. For example, the RRC allowed multiple organizations to be housed in one building as opposed to each fundraising and constructing their own facilities. Similarly, the Williston State College Foundation's takeover of the DMV allowed its operations to continue when no other entity wanted to run it. In this light, the shared services projects in the Bakken echoed those found in other communities.

However, the shared services projects that occurred in the Bakken also reflect a unique set of circumstances that serve to expand the shared services literature. As Delabbio and Zeemering (2013) argue, the local context is important for understanding the successes and failures of shared services. UOG booms in remote geographies offer short-term economic benefits and a host of short- to long-term challenges, ranging from increased traffic to economic overspecialization on a volatile commodity (Haggerty et al., 2018b). Many of these impacts are more intense during the beginning phases of the boom. Remote boomtowns face hard-to-predict and extreme swings in service demand that create an ambiguous planning space and revenue outlook (Keough 2015). Much of the previous literature on boomtowns paints local governments as overwhelmed by energy impacts or at best passive.

In this context, we offer the following readings of the findings. On the one hand, the boom prompted an immense amount of innovation at the local level, demonstrated here by community leaders' use of a wide variety of shared services. This observation challenges existing depictions of rural energy boomtowns as overwhelmed and passive. A narrative of rural innovation and local agency in response to energy impacts is often ignored within boomtown and social disruption research, though it has been noted in the shared services literature (e.g., Hilvert & Swindell, 2013). In the cases reported here, rural energy boomtowns in the Bakken responded effectively to the rapid pace and scale of impacts by filling service gaps and uniting services that were previously fragmented. The end results ranged in contract length, the amount of complexity involved, and level of shared governance. Nonetheless, all of the projects speak to a high level of inventiveness as leaders worked to address boomtown impacts.

On the other hand, shared services at times allowed for community projects to expand to the point of aggravating the risk of exposure to volatile service demand and revenue streams. In this way, their role in the success of local governments in responding to energy impacts was mixed. This was particularly true for the larger

and longer-term shared services projects in this case study. Despite their marked innovation, the projects described here suggest a tendency towards the extravagant. Whereas shared services are often employed to minimize costs, the use of shared services in the Bakken increased debt obligations. The ARC and the RRC are two of the largest municipally-owned recreation facilities in the United States, though they serve relatively small population centers. Both centers struggled to make loan payments during slowdowns in UOG development.

Here is the other dimension of an energy boom, particularly one as large in magnitude as the Bakken—the problem of forecasting service demands in the context of uncertain and/or unreliable estimates of future population change. Shared services that were created as solutions to temporary boom impacts suggest the nimbleness with which local governments can plan despite the uncertainty. The Foundation's management of the DMV was an unorthodox but practical governance solution to the DMV's pending closure. In contrast, the RRC and the ARC were financially larger and longer-term investments. Rather than mitigating against the effects of declines in population and economic activity, the shared services worked to exacerbate their exposure to decline. These projects reinforced the tendency of many community leaders to be overly optimistic about the duration and long-term benefits of the boom.

These projects hold important lessons for local governments and decision makers. First, when compared to the shared service projects that address temporary impacts, the RRC and the ARC are better poised to create long-term benefits for the two cities. However, they are also riskier. This reinforces a fundamental tension for communities that host natural resource extraction: while community leaders may desire economic diversification, their ability to actually achieve this goal is constrained (Freudenburg, 1992). Second, community leaders must take into account the high degree of uncertainty regarding different outcomes (or the timing of different outcomes) of oil development. As shown by Haggerty et al. (2018a), many community members believe that the boom will last longer than it actually does. While the boom-bust cycle was acknowledged in interviews, community leaders still tended to gravitate towards the grandiose and were willing to finance projects through revenues streams that were dependent on UOG development levels. Third, in the context of a boom, employing shared services as an impact mitigation strategy introduces a risk of overdevelopment. Shared services were used as a tool to help overcome fiscal barriers that might have limited the scale of projects. Overdevelopment can lead to long-term fiscal problems for municipalities, particularly when a bust occurs. Collectively, the findings suggest that because rural communities with UOG development are exposed to the whims of the global market, they need to approach shared services with caution.

6.0 Conclusion

This paper investigated the interaction between the context of an energy boom and the opportunities present in shared service arrangements for local governments. It sought to (1) document how local governments mitigated stresses to their services in the Bakken shale play, (2) draw connections between the boomtown and shared services literature with the goal of addressing gaps in both, and (3) critique the use of shared services in the context of the rural, isolated boomtown. A key interest was how the motivations for and outcomes of shared services strategies reflected the specific context of the Bakken oil boom. In addition to being rural and remote,

Bakken boomtowns experienced hard-to-predict, steep swings in service demands in a context of revenue shortfalls and uncertainty.

Although impacts from UOG development at times overwhelmed Williston and Watford City, the projects profiled here demonstrated a considerable amount of agency and creativity. Shared services were an important strategy in addressing the rapid increases in service demand and the associated problems of limited revenue. These projects demonstrated how shared services could be employed as a strategy to improve quality of life and the local innovation that communities can deploy in response to shocks such as an energy boom.

Nonetheless, the political economy of the UOG industry and the volatility of revenue streams makes long-term planning for service provision and production difficult. When budgets are flush, there is a risk that communities will finance projects based on volatile revenue sources, overbuild, and/or amass debt that can become burdensome during periods of slowdown in UOG activity. This study found that shared service arrangements could exacerbate these risks.

This study signals several areas for future research. The contributors to over-optimism on the part of local leaders in the specific context of UOG development merit attention from energy impact researchers. In addition, communities need practical advice on opportunities to plan and finance modular development in ways that optimize short- and long-term flexibility. This case study also demonstrates the rewards of expanding the shared services literature into geographies previously overlooked, such as boomtowns or other rural areas experiencing rapid growth.

Finally, the authors would like to end on a note of appreciation for the community leaders who live and work in communities with UOG development. The interviewees in this case study invested significant and often unacknowledged time and effort in developing the projects highlighted here. Many of them volunteered on these projects or extended their work duties far beyond normal expectations. As UOG development rises and falls alongside global oil prices, more work needs to be done at the local level to understand opportunities, risks, and adaptation strategies to improve local communities' experiences with energy development.

References

Alexander, E. R. (1995). *How organizations act together: Interorganizational coordination in theory and practice*. Amsterdam: Gordon & Breach. https://doi.org/10.4324/9781315075822

Becker, K. (2016). The paradox of plenty: Blessings and curses in the oil patch. In K. Conway, W. Caraher (Eds.), *The Bakken goes boom: Oil and the changing geographies of western North Dakota* (pp. 11–30). Grand Forks: Digital Press at the University of North Dakota.

Bel, G., & Warner, M. E. (2015). Intermunicipal cooperation and costs: Expectations and evidence. *Public Administration*, *93*(1), 52–67. https://doi.org/10.1111/padm.12104

Bel, G., & Warner, M. E. (2016). Factors explaining inter-municipal cooperation in service delivery: A meta-regression analysis. *Journal of Economic Policy Reform*, *19*(2), 91–115. https://doi.org/10.1080/17487870.2015.1100084

Bel, G., Hebdon, R., & Warner, M. E. (2018). Beyond privatisation and cost savings: Alternatives for local government reform. *Local Government Studies, 44*(2), 173–182. https://doi.org/10.1080/03003930.2018.1428190

Benton, J. E. (2013). Local government collaboration: Considerations, issues, and prospects. *State and Local Government Review, 45*(4), 220–223. https://doi.org/10.1177%2F0160323X13515683

Brenner, N. (2002). Decoding the newest 'metropolitan regionalism' in the USA: A critical overview. *Cities, 19*, 3–21. https://doi.org/10.1016/S0264-2751(01)00042-7

Blair, R., & Janousek, C. L. (2013). Collaborative mechanisms in interlocal cooperation: A longitudinal examination. *State and Local Government Review, 45*(4), 268–282. https://doi.org/10.1177%2F0160323X13511647

Brown, D. L., & Schafft, K. A. (2011). *Rural people and communities in the 21st century: Resilience and transformation*. Malden, MA: Polity Press.

Bryson, J. M., Crosby, B. C., & Stone, M. M. (2006). The design and implementation of cross-sector collaborations: Propositions from the literature. *Public Administration Review, 66*, 44–55. https://doi.org/10.1111/j.1540-6210.2006.00665.x

Carr, J. B., & Hawkins, C. V. (2013). The costs of cooperation: What the research tells us about managing the risks of service collaborations in the US. *State and Local Government Review, 45*(4), 224–239. https://doi.org/10.1177%2F0160323X13508793

Charmaz, K. (2005). Grounded theory in the 21st century: Applications for advancing social justice studies. In N. K. Denzin, & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (pp. 507–35). Thousand Oaks: Sage.

Christopherson, S., & Rightor, N. (2012). How shale gas extraction affects drilling localities: Lessons for regional and city policy makers. *Journal of Town and City Management, 2*(4), 1–20.

Dahle, T. O., Archbold, C. A. (2015). "Just do what you can […] make it work!" Exploring the impact of rapid population growth on police organizations in western North Dakota. *Police: An International Journal of Police Strategies and Management, 38*(4), 805–819. https://doi.org/10.1108/PIJPSM-03-2015-0037

Delabbio, D. J., & Zeemering, E. S. (2013). Public entrepreneurship and interlocal cooperation in county government. *State and Local Government Review, 45*(4), 255–267. https://doi.org/10.1177%2F0160323X13513272

Fernando, F. N., & Cooley, D. R. (2016a). An oil boom's effect on quality of life (QOL): Lessons from western North Dakota. *Applied Research in Quality of Life, 11*(4), 1083–1115. https://doi.org/10.1007/s11482-015-9422-y

Fernando, F. N., & Cooley, D. R. (2016b). Socioeconomic system of the oil boom and rural community development in western North Dakota. *Rural Sociology, 81*(3), 407–444. https://doi.org/10.1111/ruso.12100

Flora, C. B., Flora, J. L., & Gasteyer, S. P. (2016). Rural communities: Legacy and change. Fifth edition. Boulder, CO: Westview Press.

Freudenburg, W. R. (1992). Addictive economies: Extractive economies and vulnerable localities in a changing world economy. *Rural Sociology*, *57*(3), 305–332. https://doi.org/10.1111/j.1549-0831.1992.tb00467.x

Gilmore, J. S. (1976). Boom towns may hinder energy resource development. *Science*, *191*(4227), 535–540.

Guilliford, A. (1989). *Boomtown blues: Colorado oil shale 1885-1985*. Boulder, CO: University Press of Colorado.

Haffner, A., (2017, September 17). The boom's bill: After years of boom, oil patch cities paying off growth debt. *Bismarck Tribune, Forum News Service.* Retrieved from https://bismarcktribune.com/news/state-and-regional/the-boom-s-bill-after-years-of-boom-oil-patch/article_77d1a657-152e-52f5-871a-650e452c2ee1.html

Haggerty, J., Kelsey, T., Fahoome, A., Coupal, R., Kay, D., & Lachapelle, P. (2018a). The relationship between oil and gas development and businesses in McKenzie, Richland, Sheridan, and Tioga Counties. Retrieved from http://www.montana.edu/energycommunities/documents/BusinessFinal-PDF.pdf

Haggerty, J. H., Kroepsch, A. C., Walsh, K. B., Smith, K. K., & Bowen, D. W. (2018b). Geographies of Impact and the Impacts of Geography: Unconventional Oil and Gas in the American West. *The Extractive Industries and Society*, 5, 61–633. https://doi.org/10.1016/j.exis.2018.07.002

Haggerty, J. H., Smith, K., Mastel, T., Lapan, J., & Lachapelle, P. (2018c). Assessing, monitoring, and addressing boomtown impacts in the US: Evaluating an existing public health model. *Impact Assessment and Project Appraisal*, *36*(1), 115–127. https://doi.org/10.1080/14615517.2017.1364022

Headwaters Economics. (2012, February). *County Level Drilling Activity, 2001-2011 Rig Data by Year in Colorado, Montana, New Mexico, North Dakota, Utah, and Wyoming Counties.* Analysis summary. Bozeman, MT: Julia H. Haggerty.

Hefetz, A., Warner, M. E., & Vigoda-Gadot, E. (2012). Privatization and intermunicipal contracting: The US local government experience 1992–2007. *Environment and Planning C: Government and Policy, 30*(4), 675–692. https://doi.org/10.1068%2Fc11166

Hilvert, C., & Swindell, D. (2013). Collaborative service delivery: What every local government manager should know. *State and Local Government Review, 45*(4), 240–254. https://doi.org/10.1177%2F0160323X13513908

Hultquist, A., Harsell, D. M., Wood, R. S., & Flynn, D. T. (2017). Assessing the impacts of transaction costs and rapid growth on local government service provision and delivery arrangement choices in North Dakota. *Journal of Rural Studies*, *53*, 14–25. https://doi.org/10.1016/j.jrurstud.2017.05.003

Jacquet, J. (2009). *Energy boomtowns and natural gas: Implications for Marcellus shale local governments and rural communities. NERCRD Rural Development.* University Park, PA: Northeast Regional Center for Rural Development. Retrieved from https://www.researchgate.net/publication/281900182_Energy_Boom_Towns_and_Natural_Gas_Implications_for_Marcellus_Shale_Local_Governments_Rural_Communities

Jacquet, J., & Kay, D. L. (2014). The unconventional boomtown: Updating the impact model to fit new spatial and temporal scale. *Journal of Rural and Community Development*, *9*(1), 1–23.

Jimenez, B. S., & Hendrick, R. (2010). Is government consolidation the answer? *State and Local Government Review*, *42*(3), 258–270. https://doi.org/10.1177%2F0160323X10386805

JLG Architects. (n.d.). Williston Area Recreation Center: Williston, North Dakota. Accessed March 16, 2019, from https://jlgarchitects.com/projects/williston-area-recreation-center/

Kay, D., & Corrigan, B. (2018, November 16). *An empirical analysis of intermunicipal service sharing and its effects on local government spending in New York State.* Community and Regional Development Institute, Cornell University. Retrieved from https://cardi.cals.cornell.edu/sites/cardi.cals.cornell.edu/files/shared/documents/KayCorrigan_EmipricalAnalysisSharedServicesNYS_2016.pdf

Keough, S. B. (2015). Planning for growth in a natural resource boomtown: Challenges for urban planners in Fort McMurray, Alberta. *Urban Geography*, *36*(8), 1169–1196. https://doi.org/10.1080/02723638.2015.1049482

Kim, Y. (2018). Can alternative service delivery save cities after the Great Recession? Barriers to privatisation and cooperation. *Local Government Studies*, *44*(1), 44–63. https://doi.org/10.1080/03003930.2017.1395740

Killelea, Eric. (2013, December 13). DMV to move office to WSC apartments. *Williston Herald*. Retrieved from https://www.willistonherald.com/news/dmv-to-move-o%F4%80%82%A3ce-to-wsc-apartments/article_e6cc416c-640f-11e3-ba18-001a4bcf887a.html

Kim, Y., & Warner, M. E. (2016). Pragmatic municipalism: Local government service delivery after the great recession. *Public Administration*, *94*(3), 789–805. https://doi.org/10.1111/padm.12267

Kohrs, E. V. (1974, April 24–26). *Social consequences of boom growth in Wyoming.* Paper presented at the Rocky Mountain American Association of the Advancement of Science Meeting, Laramie, Wyoming. Retrieved from http://www.sublettewyo.com/Archive/ViewFile/Item/97

Kraenzel, C. F. (1955). *The Great Plains in transition.* Norman, OK: University of Oklahoma Press.

Krannich, R. S. (2017, July 26). *Déjà vu…or something new? Community impacts of 21st century energy development through the lens of 'boom town disruption' studies*. Plenary lecture at Energy Impacts 2017 Symposium, Energy Impacts Research Coordination Network, Columbus, Ohio.

Lee, M. (2016, November 1). A sports complex and the downside of debt in the oil patch. *E&E News*. Retrieved from https://www.eenews.net/special_reports/busted/stories/1060045063

Linden, R. M. (2010). *Leading across boundaries: Creating collaborative agencies in a networked world*. San Francisco, CA: John Wiley & Sons.

Lindlof, T. R., & Taylor, B. C. (2011). *Qualitative communication research methods*. Thousand Oaks, CA: Sage.

Loder, T. (2016). Spaces of consent and the making of fracking subjects in North Dakota: a view from two corporate community forums. *The Extractive Industries and Society, 3(3),* 736–743. https://doi.org/10.1016/j.exis.2016.04.004

Markey, S., Halseth, G., Ryser, L., Argent, N., & Boron, J. (2019). Bending the arc of the staples trap: Negotiating rural resource revenues in an age of policy incoherence. *Journal of Rural Studies, 67*, 25–36. https://doi.org/10.1016/j.jrurstud.2019.02.002

McEvoy, J., Gilbertz, S. J., Anderson, M. B., Ormerod, K. J., Bergmann, N. T. (2017). Cultural theory of risk as a heuristic for understanding perceptions of oil and gas development in Eastern Montana. USA. *The Extractive Industries & Society*, *4* (4), 852–859. https://dx.doi.org/10.1016%2Fj.exis.2017.10.004

Measham, T. G., Fleming, D. A., & Schandl, H. (2016). A conceptual model of the socioeconomic impacts of unconventional fossil fuel extraction. *Global Environmental Change*, *36*, 101–110. https://doi.org/10.1016/j.gloenvcha.2015.12.002

Morse, R. S., & Abernathy, C. R. (2015). Mapping the shared services landscape. In A. Henderson (Ed.), *Municipal shared services and consolidation: A public solutions handbook* (pp. 143–160). New York: Routledge.

Newell, R. G., & Raimi, D. (2015). *Oil and gas revenue allocations to local governments in eight states*. National Bureau of Economic Research, Working Paper 21615. Retrieved from https://www.nber.org/papers/w21615.pdf

Newell, R. G., & Raimi, D. (2018). The fiscal impacts of increased US oil and gas development on local governments. *Energy Policy*, *117*, 14–24. https://doi.org/10.1016/j.enpol.2018.02.042

Raimi, D., & Newell, R. G. (2016). *Dunn County and Watford City, North Dakota: A case study of the fiscal effects of Bakken shale development*. Durham, NC: Duke University Energy Initiative.

Rao, M. (2018). *Great American outpost: Dreamers, mavericks, and the making of an oil frontier*. New York: Hachette Book Group.

Raudla, R., & Tavares, A. F. (2018). Inter-municipal cooperation and austerity policies: Obstacles or opportunities? In R. Hulst, & A. Van Montfort (Eds.), *Inter-municipal cooperation in Europe: Governance and public management* (pp. 17-41). New York: Palgrave Macmillan.

Ruddell, R. (2017). *Oil, gas, and crime: The dark side of the boomtown*. New York: Palgrave/Macmillan.

Shipman, N. A. (2018, January 17). City asks county to help with housing debt. *McKenzie County Farmer*. Retrieved from http://www.watfordcitynd.com/latest-news/city-asks-county-to-help-with-housing-debt/

Smith, K. K., & Haggerty, J. H. (2018). Devolved governance & alternative dispute resolution programs: An example from the Bakken. In K. Brasier, M. Cotton, and J. Whitton (Eds.), *Governing shale gas: Development, citizen participation and decision making in the US, Canada, Australia and Europe* (184–197). London: Routledge.

Smith, M. D., Krannich, R. S., & Hunter, L. M. (2001).Growth, decline, stability, and disruption: a longitudinal analysis of social well-being in four western rural communities. *Rural Sociology, 66 (3),* 425–450. https://doi.org/10.1111/j.1549-0831.2001.tb00075.x

Vision West ND. (2012). City of Watford City, ND: Municipal Infrastructure Needs Assessment.

Walsh, K. B., & Haggerty, H. H. (2019). *Social science research in energy communities.* Bozeman, MT: Montana State University, Resources and Communities Research Group.

Warner, M. E. (2006). Market-based governance and the challenge for rural governments: US trends. *Social Policy & Administration*, *40*(6), 612–631. https://doi.org/10.1111/j.1467-9515.2006.00523.x

Warner, M. (2017). *Lessons learned from ICMA's alternative service delivery survey.* Unpublished paper presented at the 2017 ICMA Conference, San Antonio, Texas.

Warner, M., & Hefetz, A. (2009). *Trends in public and contracted government services from 2002–2007.* Policy Brief 80. Los Angeles, CA: Reason Foundation. Retrieved from https://web.extension.illinois.edu/lgien/pdf/events/2012-01-19_trends.pdf

Williston Board of City Commissioners. (2018, September 25). City Commission Meeting. Williston, North Dakota. Retrieved from https://www.cityofwilliston.com/09.25.18%20Minutes.pdf

Wilson, C. E., Morrison, T. H., Everingham, J.-A., & McCarthy, J. (2017). Steering social outcomes in America's energy heartland: State and private meta-governance in the Marcellus shale, Pennsylvania. *American Review of Public Administration*, *47*(8), 929–944. https://doi.org/10.1177%2F0275074016654012

Zeemering, E. S. (2017). Why terminate? Exploring the end of interlocal contracts for police service in California cities. *American Review of Public Administration*, *48*(6), 596–609. https://doi.org/10.1177%2F0275074017701224

Zeemering, E. S., & Delabbio, D. (2013). *A county manager's guide to shared services in local government.* Washington DC: The IBM Center for the Business of Government.