

Analysis of Act 13 Spending

by Pennsylvania Municipalities and Counties

By: Shailendra N. Gajanan, MA, Ph.D. and Stephen F. Robar, MPA, Ph.D.

University of Pittsburgh – Bradford

July 2016

Executive Summary

Act 13 of 2012, the Unconventional Gas Well Impact Fee Act, amended Title 58 of the Pennsylvania Consolidated Statutes to implement an unconventional gas well impact fee on unconventional natural gas wells. It also established an Unconventional Gas Well Fund to be administered by the Public Utility Commission (PUC). Act 13 provided statutory guidelines for the use and distribution of impact fee funds to state agencies, counties, and municipalities. The guidelines assigned 60 percent of the Unconventional Gas Well Funds to be distributed to eligible counties and municipalities.

The scale and scope of Pennsylvania's Marcellus natural gas drilling activity, and the impact fee resources generated and distributed, have generated interest in how counties and municipalities are allocating and using the Act 13 funds. This study reviewed Act 13 impact fee monies disbursed for 2012, 2013 and 2014 to describe the overall dynamics and shape of disbursements to counties and municipalities and to analyze their spending/allocation priorities. The study also identified trends and significant patterns in county and municipal expenditures as a result of Marcellus natural gas activity and Act 13 funding.

The first goal of the study, which was conducted in 2015, was to number and describe Act 13 funds received by the 37 county and 1,487 municipal governments in the Marcellus region of Pennsylvania for 2012, 2013 and 2014. The second goal was to identify and analyze county and municipal expenditure and

allocation trends, if any, relative specifically to Act 13 impact fee monies. The third goal was to identify any discernable impacts on and changes in county and municipal budget priorities and spending patterns over time as a result of Marcellus natural gas drilling and the receipt of Act 13 resources.

This research used secondary data published by the Pennsylvania Public Utility Commission (PUC) regarding Act 13 impact fee distributions and self-reported usage report data, as well as county and municipal financial data from the Department of Community and Economic Development (DCED). To augment this secondary data, the study generated primary data through a set of surveys of counties and municipalities.

The research found that:

1. A very significant and substantial portion of Act 13 impact fee resources are being disbursed to a relatively concentrated set of counties and municipalities.
2. In regard to impact fee allocations, counties tended to place a priority on Emergency Preparedness and Public Safety, and municipalities tended to place a priority on Public Infrastructure.
3. Unlike earlier research efforts, discernable trends in county and municipal expenditures are beginning to take shape, and these trends are becoming visible in annual financial reporting data.

Based on the study findings, the researchers offered the following policy considerations:

- 1.) Develop a financial accounting system that gathers more specific and detailed information on how counties and municipalities are using Act 13 resources.
- 2.) Support additional research on how the budgets of counties and municipalities on the periphery of Marcellus development are being impacted.
- 3.) Gather more detailed information on how county and municipal governments are using Legacy funds.
- 4.) Support additional research on the impact of Marcellus development and Act 13 funding in the areas of health and human services.
- 5.) Recognize the importance of Act 13 or other revenues to county and municipal governments because Marcellus activity is having an impact in local communities.

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This project was sponsored by a grant from the Center for Rural Pennsylvania, a legislative agency of the Pennsylvania General Assembly.

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Introduction

Act 13 of 2012, the Unconventional Gas Well Impact Fee Act, which was signed into law on Feb. 14, 2012, amended Title 58 (Oil and Gas) of the Pennsylvania Consolidated Statutes. It provided for the imposition of an impact fee on unconventional natural gas wells, and the establishment of an Unconventional Gas Well Fund to be administered by the Public Utility Commission (PUC). In 2013, Pennsylvania ranked second in marketed natural gas produced in the U.S. (U.S. Energy Information Administration, 2015), the bulk of the production coming from four counties in northeastern Pennsylvania and two counties in southwestern Pennsylvania. However, there are 37 counties in Pennsylvania with varying degrees of Marcellus activity taking place. According to the PUC, in 2013, there were 57 producers and a total of 6,274 unconventional gas wells in production (PUC, 2014). Impact fees collected from producers for 2013 totaled \$225,752,000. Since the implementation of Act 13, including the most recent 2014 distribution, a total of \$855,934,000 in impact fee monies have been collected (PUC, 2015).

Act 13 impact fees are structured based on a 15-year fee schedule. The fee per well is based primarily on the average annual price of natural gas, as well as the number of years the well has been in production, and takes into account the regional CPI for natural gas. There is a five-tier rate scale used to designate the price of natural gas component, as well as the 15-year chronological schedule, where the impact fee per well is reduced over the 15-year life of the well. Act 13 provides for no well impact fees beyond 15 years, and the impact fee is essentially not affected by the level of production of the well.

Act 13 provides statutory guidelines [Section 2314 of Act 13] as to the use and distribution of impact fee funds to various state governmental entities, counties and municipalities, and the Marcellus Legacy Fund [Section 2315]. Prior to the distribution of funds to county and municipal governments, which are intended to mitigate the local impacts of drilling, a number of state entities receive funding for a variety of purposes. These include: the PUC; the State Conservation Commission and County Conservation Districts; the Pennsylvania Fish and Boat Commission; the Department of Environmental Protection (DEP); the Pennsylvania Emergency Management Agency (PEMA); the Office of State Fire

Commissioner; the Pennsylvania Department of Transportation (PennDOT); and the Natural Gas Energy Development Program (2012-2014).

After the primary and initial allocation of funds to the above entities takes place, 60 percent of the remaining funds are assigned to the Unconventional Gas Well Fund (these funds will be referred to in this report as UGW or Spud funds) to be distributed to eligible counties and municipalities, and 40 percent of the remaining funds are allocated to the Marcellus Legacy Fund for state-level programs and initiatives, a portion of which are specifically set aside for all counties. Twenty-five percent of the Marcellus Legacy Fund is allocated to the Highway Bridge Improvement Fund, with each county receiving funds based on a population percentage, though each county is guaranteed a minimum of \$40,000 (the monies are released relative to an approved renovation plan). Fifteen percent of the Marcellus Legacy Fund is allocated for Environmental Initiatives, including the planning, acquisition, development and rehabilitation of greenways, recreational trails, and a variety of conservation efforts. Here as well, the distribution of funds is based on a population percentage, with each county guaranteed a minimum of \$25,000, to the extent funds are available.

Of the 60 percent of the UGW funds that go to counties and municipalities, 36 percent (of the 60 percent) is distributed to counties with spud wells. The amount each county receives is determined as a function of the percentage of spud wells located in the county relative to the total number of spud wells in the state. Thirty-seven percent (of the 60 percent) is distributed separately to municipalities, with spud wells using the same percentage formula – the percentage of wells in the municipality relative to the state total.

The remaining 27 percent (of the 60 percent) is distributed to all municipalities in counties with wells. The 27 percent is first “allocated” proportionally by county, and then one half is distributed to: (a) municipalities with spud wells, or (b) to municipalities that are either contiguous with a municipality with spud wells, or are located within 5 miles of a municipality with spud wells. The other half is distributed to all municipalities within an eligible county. This remaining 27 percent is calculated based on population and highway miles within the municipality.

Act 13 also provides for restrictions on the amount allocated to each municipality. The actual distribution to each municipality shall not exceed \$500,000 or 50 percent of the municipality's operating budget of the prior fiscal year, whichever is greater. Monies in excess of these restrictions are placed into the Housing Affordability and Rehabilitation Enhancement Fund. Twenty-two municipalities were subject to the restriction for 2012 distributions (production year 2011), 16 in 2013 and 19 in 2014, all from the top six producing Marcellus counties, for a 3-year total of \$13,789,731.86.

Act 13 also establishes provisions regarding how the impact fee funds distributed to counties and municipalities must be used. These include: maintenance and repair of public infrastructure; water, stormwater and sewer systems; emergency preparedness; environmental programs; preservation of surface and groundwater systems; tax reductions; affordable housing projects; information technology and GIS; social service delivery; judicial services; capital reserve funds; oil and gas workforce development; and local and regional planning. Counties and municipalities are required to submit to the PUC annual "Usage Reports" indicating how these funds have either been used, or are intended to be used. The counties and municipalities that receive these funds are expected to use these funds in ways that attempt to meet the needs of the local citizenry and communities affected by the gas drilling activity in Pennsylvania.

The first Marcellus gas well came on-line in Washington County in 2004 (Jacobson and Kelsey, 2011) and the Marcellus Shale industry in Pennsylvania has now fully entered its second decade. In a commonwealth with an economic history long-associated with natural resource extraction, there exists a robust body of literature and research regarding the social, economic and environmental impacts of the traditional dynamics of "boom-bust" extractive economies like coal, oil, and mining (Jacquet, 2009; Jacquet and Kay, 2014). Given, however, the enormity and significance of the Marcellus industry, there now exists a growing body of research on the relatively contemporary effects of the industry.

Research over the past decade has sought to examine and describe the effects of natural gas drilling on human health, crime dynamics (Kowalski, L. and G. Zajac, 2012), the education system, the environment,

public and private infrastructure, county and municipal governments, social and individual economics¹, general personal well-being and quality of life dynamics², and it continues to be generated.³ This study, however, is not directly interested in these types of impacts per se. Rather, previous research literature serves to help develop the context within which state, county and municipal allocation decisions might be examined relative to the structure of Act 13 and the impact fee.

The scale and scope of Pennsylvania's Marcellus natural gas drilling activity, and the impact fee resources generated and distributed over the past 4 years as a result, have of course generated interest in terms of how counties and municipalities (and perhaps those groups and organizations who might ultimately be recipients of these funds through their counties) are choosing to allocate and use these resources. Whether the interests or concerns regard the tangible impacts of Marcellus activity, or the processes by which local governments and public officials respond to those dynamics, these are issues central to public discourse, governance and policy making, specifically because Act 13 impact fee resources are intended to be directed to the various impacts and challenges faced by local governments affected by drilling. While there is, as indicated, a significant body of research attempting to address the various impacts of Marcellus activity (and these research efforts will be referenced and used in the conclusion and policy consideration sections of this report), there is a limited body of research that examines specifically how Marcellus activity generally, and Act 13 specifically, have affected county and municipal fiscal decision-making (Jacobson, M. and T. Kelsey; 2011; Kelsey, T, M. Shields, J. Ladlee, and M. Ward et. al., 2011; Brasier, K., L. Davis, L. Glenna, T. Kelsey, D. McLaughlin, K. Schafft, K. Babbie. C. Biddle, A. Delessio-Parson and D. Rhubarb, 2014; Raimi, D. and R. Newell, 2014a; Raimi, D. and R. Newell, 2014b). This research contributes to the understanding of just how Marcellus drilling activity in general, and how Act 13 UGW fiscal resources in particular, have affected county and municipal governments in the 37 county Marcellus natural gas drilling region.

¹See Kelsey, T., M. Shields, J. Ladlee, and M. Ward in cooperation with T. Brundage, J. Lorson, L. Michael and T. Murphy, 2011.

²See Brasier, K., M. Filteau, D. McLaughlin, J. Jacquet, R. Stedman, T. Kelsey, and S. Goetz, 2011; Williamson, J. and B. Kolb, 2011.

³Refer to Schafft, K., Y. Borlu, and L. Glenna, 2013; Brasier, K., L. Davis, L. Glenna, T. Kelsey, D. McLaughlin, K. Schafft, K. Babbie. C. Biddle, A. Delessio-Parson and D. Rhubarb, 2014; Price, M., S. Herzenberg, D. Polson, S. Ward, E. Wazeter and L. Baserto, 2014.

Goals and Objectives

Though Act 13 impact fee resources have been determined now through production year 2014, this study, conducted in 2015, examined Act 13 impact fee monies that have been disbursed for the production years 2011, 2012, 2013 (received by counties and municipalities in 2012, 2013 and 2014). Further, its primary focus was on the 37 counties and the municipalities therein, that were experiencing Marcellus activity and received Act 13 monies, both UGW and Legacy during the study time period. It looked to describe the overall dynamics and shape of disbursements to counties and municipalities, as well as their spending/allocation priorities. This study, additionally, identified trends and significant changes in county and municipal expenditures as a result of Marcellus natural gas activity and Act 13 funding.

The study's first goal was to enumerate and describe the Act 13 funds received by the 37 county and 1,487 municipal governments in the Marcellus region of Pennsylvania for the 2011, 2012 and 2013 production years (2012, 2013 and 2014 reporting). The second goal was to identify and analyze county and municipal expenditure and allocation trends, if any, relative to Marcellus activity and the receipt of Act 13 impact fee monies (primarily and substantially UGW). The third goal was to identify any discernable impacts on and changes in county and municipal budget priorities and spending patterns over time as a result of Marcellus natural gas drilling in general, as well as in conjunction with the receipt of Act 13 resources.

Methodology

Contemporary research projects focusing particularly on, or including, local government dynamics associated with Marcellus activity and Act 13 have used a variety of methods. Jacobson and Kelsey used focus groups in conjunction with DCED financial data from 2001 to 2009 for two counties, Susquehanna and Washington (Jacobson, M. and T. Kelsey; 2011). Kelsey et. al. surveyed 494 municipalities in the then 12 most active Marcellus counties (Kelsey, T, M. Shields, J. Ladlee, and M. Ward et. al., 2011). The Brasier et. al. research focused on four counties – Bradford, Lycoming, Greene and Washington – and was structured as a presentation of nine topical reports. Report #7, focused on impacts for local

governments, and used two focus groups and DCED financial data from 2007 to 2010 (Brasier, K., L. Davis, L. Glenna, T. Kelsey, D. McLaughlin, K. Schafft, K. Babbie. C. Biddle, A. Delessio-Parson and D. Rhubart, 2014). And finally, the two Raimi and Newell projects relied on interviews with municipal and industry officials, as well as reported secondary data (Raimi, D. and R. Newell, 2014a; Raimi, D. and R. Newell, 2014b).

This research used several methodologies, including the analysis of secondary data published by the Pennsylvania Public Utility Commission (PUC) on Act 13 impact fee distributions and self-reported usage report data, as well as county and municipal financial data from DCED. To augment the secondary data, the researchers surveyed counties and municipalities.

Since the receipt of impact fee resources is a direct function of the level of drilling activity (number of wells) in the county, and since the various levels of drilling activity produce different sets and scales of impact, the researchers used a six-tier classification structure, based on 3-year averages of impact fee distribution, for counties as follows:

C1: \$ 3,000,000 or above (of a 3-year average of fee distributions);

C2: \$ 2,999,999 - \$ 900,000 (3-year average of fee distributions);

C3: \$ 899,999 - \$200,000 (3-year average of fee distributions);

C4: \$199,999 - \$100,000 (3-year average of fee distributions);

C5: \$99,999 – and under (3-year average of fee distributions); and

C6: No Receipt of UGW (used for Marcellus Legacy reporting).

The researchers also classified municipalities based on the way that impact fee resources are allocated to municipalities as follows:

M1: Municipalities with spud wells;

M2: Municipalities that are contiguous (or 5 miles) to municipalities with wells; and

M3: Municipalities in counties with spud wells.

Additionally, the researchers used the structure of the mandated spending reports that all municipalities and counties must complete and report to PUC. The eligible categories of spending established in Act 13 and are:

1. Public Infrastructure Construction
2. Storm Water/Sewer Systems
3. Emergency Preparedness/Public Safety
4. Environmental Programs
5. Water Preservation and Reclamation
6. Tax Reductions
7. Housing
8. Information Technology
9. Social Services
10. Judicial Services
11. Capital Reserve Fund
12. Career and Technical Centers
13. Planning Initiatives

To address the project's second goal, the researchers used the PUC data to identify any correlations relative to both county and municipal level profile data. At the county level, the researchers used the following variables: estimated population (2012); percent population change (2010-2012); population per square mile; number of urban municipalities; 3-year unemployment average (2011-2013); serious crimes per 100,000 population (2012); total miles of highway (2011); and percent of local highways. At the municipal level, the variable included: municipal population (2012); population per square mile (2010); county serious crimes per 100,000 (2012); total county miles of highway (2011); and percent of local highways. These particular demographic categories were selected because of their potential relevance to the usage report categories.

Additionally, the researchers used data from the county and municipal surveys, examining the survey data for correlations with the data reported by counties and municipalities to the PUC in the form of the usage reports.

The researchers developed two separate surveys, one for counties and one for municipalities. Surveys were distributed by mail to all 37 counties receiving impact fee resources, and to all 1,487 municipalities within those counties. Additionally, the researchers established on-line surveys for both the counties and municipalities.

Finally, the researchers used county and municipal financial data from 2007 – 2013, collected by DCED in the Municipal Statistics Reports (Pennsylvania Governor’s Center for Local Government Services and DCED, 2015), to identify trends in and effects on historical county and municipal expenditures, if any, as a result of Marcellus activity and/or Act 13.

The research also looked to identify trends and impacts by looking for such dynamics both within counties and municipalities receiving Act 13 resources, and among those rural Marcellus municipalities and counties that have received resources and those rural counties and municipalities that have not. Rural counties were defined as counties with a population density of less than 284 persons per square mile, and rural municipalities were defined as municipalities with a population density of less than 284, or, the municipality’s total population is less than 2,500, with no more than 50 percent of the population in an urban area.

To examine if there were significant changes in expenditure patterns over time, the study generally used a standard longitudinal “pre – post” structure. The 5 years of financial data from 2007 – 2011 were used to define the “pre” Act 13 impact fee period, and the 2 years of data from 2012 and 2013 were used to define the “post” Act 13 period for the analysis.⁴ Selected reporting categories from both the county and municipal financial reporting structures were examined based on their relevance and identity as compared to the Usage Report structure.

Counties and municipalities received their first actual disbursement of Act 13 funds in the fall of 2012, allowing for potential impact to their 2012 financial reports, which are reported on a calendar year. The 2013 annual financial reports would certainly be reflective of impact, though unfortunately, the 2014 annual reports were not available for this study.

Chronologically, the county financial statistics were examined using several approaches. First, the data were structured by generating averages for 2007-2008, 2009-2011, and 2012-2013. Percent changes were generated for these three groupings, allowing for some identification of rates of increase or decrease within the examined categories. Second, the percent change between 2012 and 2013 was examined. Third, when

⁴ Figures were not adjusted for inflation over the time periods. Since the analysis was concerned with percent changes within various spending categories across the time periods and not on raw actual spending increases across the periods, adjusting for inflation would not affect the analysis.

comparing rural Marcellus counties to rural non-Marcellus counties, the data were organized into two tiers, one averaging 2009-2011 and the other averaging 2012-2013. The same basic methodology was used to examine the municipal statistics, except that the groupings were 2008-2011, and 2012-2013. Finally, the difference-in-difference (DD) methodology was used to examine the data. The DD method is a technique that measures the causal effect of some non-random intervention (Angrist and Krueger, 1999; Wooldridge, 2002; Stock and Watson, 2011): in this case, the receipt of Act 13 funds.

While the examination of the financial data within counties and municipalities required no restructuring of the data, in the case of the comparative examination of counties and municipalities it was necessary to specifically design comparative groups based on the designation of rural counties and municipalities. In other words, the research removed the four urban counties of Allegheny, Beaver, Lackawanna and Westmoreland from the 37 “Marcellus” counties. The comparison group then became the 15 rural counties that are not experiencing Marcellus activity. In this way, all rural counties that have wells and received impact fees were positioned against all rural counties that have not. The researchers essentially structured the data for municipalities the same way. The research then sought to identify if there were any significant and identifiable trends.

Results

Disbursement of Act 13 Impact Fee Revenues

With respect to the 37 counties and 1,487 municipalities that received the 60 percent Spud monies for production years 2011, 2012 and 2013, a total of \$313,105,290.74 was disbursed: \$100,800,438.78 in 2012 (for production year 2011), \$98,860,813.75 in 2013 (2012), and \$113,444,038.21 for 2014 (2013). In total, \$117,741,743.41 went to counties, and \$195,363,547.33 went to municipalities (See Table 1). All Pennsylvania counties received Legacy monies (40 percent) based on population. The total statewide Legacy allocation for 2011-2013 was \$33,956,039.99, with \$11,751,265.17 going to the 37 Marcellus counties, and \$22,204,774.82 going to the remaining counties. Moving forward in this report, all tables

and text will refer to the years 2012, 2013 and 2014, the years when the impact fee monies were actually dispersed.

	2012	2013	2014	Total
Counties (37) Total	\$38,241,359.79	\$36,965,951.82	\$42,534,431.80	\$117,741,743.41
Municipal (1487) Total	\$62,559,078.99	\$61,894,861.93	\$70,909,606.41	\$195,363,547.33
C&M Total	\$100,800,438.78	\$98,860,813.75	\$113,444,038.21	\$313,105,290.74

Data Source: Pennsylvania Public Utility Commission.

Analysis of Counties

Six counties were identified as fitting the C1 classification of a 3-year average of annual fee distributions of \$3 million or more: Bradford, Greene, Lycoming, Susquehanna, Tioga, and Washington. These six counties received the overwhelming bulk of Act 13 distributions with 73.90 percent of the total county distribution, and 27.79 percent of total overall UGW (spud) monies from 2012 to 2014 (See Table 2a).

County	Type	2012	2013	2014	Total
Bradford	C1	\$8,375,502.10	\$7,244,219.19	\$6,993,829.50	\$22,613,550.79
Greene	C1	\$3,097,788.45	\$2,873,957.75	\$3,591,074.94	\$9,562,821.14
Lycoming	C1	\$3,927,395.61	\$4,277,978.39	\$4,987,243.32	\$13,192,617.32
Susquehanna	C1	\$3,900,918.79	\$4,159,328.76	\$5,415,834.54	\$13,476,082.09
Tioga	C1	\$4,757,002.77	\$4,350,486.50	\$4,363,837.90	\$13,471,327.17
Washington	C1	\$4,253,943.11	\$4,521,869.30	\$5,915,857.64	\$14,691,670.05
C1 Totals		\$28,312,550.83	\$27,427,839.89	\$31,267,677.84	\$87,008,068.56
County Total		\$38,241,359.79	\$36,965,951.82	\$42,534,431.80	\$117,741,743.41
Percentage		74.04%	74.20%	73.51%	73.90%

Data Source: Pennsylvania Public Utility Commission.

Five counties were identified under the C2 classification of a 3-year average of annual distributions of \$2,999,999 - \$900,000 as follows: Butler, Westmoreland, Fayette, Clearfield and Wyoming. These five

counties received 14.36 percent of the county distributions, and 5.40 percent of the total Spud distribution (See Table 2b).

County	Type	2012	2013	2014	Total
Butler	C2	\$741,351.08	\$1,001,930.22	\$1,571,501.15	\$3,314,782.45
Clearfield	C2	\$1,076,724.19	\$929,422.11	\$915,626.70	\$2,921,773.00
Fayette	C2	\$1,332,666.82	\$1,232,637.84	\$1,331,230.31	\$3,896,534.97
Westmoreland	C2	\$1,412,097.29	\$1,272,187.72	\$1,357,205.54	\$4,041,490.55
Wyoming	C2	\$856,083.98	\$725,081.08	\$1,149,403.73	\$2,730,568.79
C2 Totals		\$5,418,923.36	\$5,161,258.97	\$6,324,967.43	\$16,905,149.76
County Total		\$38,241,359.79	\$36,965,951.82	\$42,534,431.80	\$117,741,743.41
Percentage		14.17%	13.96%	14.87%	14.36%

Data Source: Pennsylvania Public Utility Commission.

These two tables alone indicate quite clearly that the overwhelming bulk of unconventional natural gas drilling is occurring in the six dominant counties. For the 5-year period of 2010-2014, 2,984 gas drilling permits were issued for Bradford County, 1,262 for Greene, 1,520 for Lycoming, 1,930 for Susquehanna, 1,479 for Tioga, and 1,656 for Washington, totaling 10,831. By comparison, Butler had 673, Clearfield had 348, Fayette had 302, Westmoreland had 362 and Wyoming had 509, for a total of 2,193. Taken together, the C1 and C2 counties represent more than 88 percent of the total county allocations. Tables 2c, 2d, and 2e, present the spud distributions for the remaining county classifications.

County	Type	2012	2013	2014	Total
Armstrong	C3	\$511,885.27	\$533,923.34	\$597,430.18	\$1,643,238.79
Centre	C3	\$529,536.48	\$408,682.06	\$305,208.90	\$1,243,427.44
Clinton	C3	\$706,048.64	\$606,431.45	\$513,010.70	\$1,825,490.79
Elk	C3	\$370,675.54	\$283,440.78	\$350,665.54	\$1,004,781.86
Indiana	C3	\$282,419.45	\$217,524.32	\$259,752.25	\$759,696.02
McKean	C3	\$379,501.14	\$316,399.01	\$396,122.19	\$1,092,022.34
Potter	C3	\$529,536.48	\$382,315.48	\$376,640.77	\$1,288,492.73
Sullivan	C3	\$361,849.93	\$435,048.65	\$532,492.12	\$1,329,390.70
C3 Totals		\$3,671,452.93	\$3,183,765.09	\$3,331,322.65	\$10,186,540.67
Percent County		9.60%	8.61%	7.83%	8.65%
Percent Overall		3.64%	3.22%	2.94%	3.25%

Data Source: Pennsylvania Public Utility Commission.

County	Type	2012	2013	2014	Total
Allegheny	C4	\$79,430.47	\$145,016.21	\$201,307.99	\$425,754.67
Beaver	C4	\$52,953.64	\$151,607.86	\$207,801.80	\$412,363.30
Clarion	C4	\$123,558.51	\$98,874.69	\$110,394.70	\$332,827.90
Jefferson	C4	\$158,860.94	\$184,566.09	\$194,814.19	\$538,241.22
Lawrence	C4	\$17,651.21	\$131,832.92	\$201,307.99	\$350,792.12
Somerset	C4	\$114,732.90	\$125,241.27	\$123,382.32	\$363,356.49
C4 Totals		\$547,187.67	\$837,139.04	\$1,039,008.99	\$2,423,335.70
Percent County		1.43%	2.26%	2.44%	2.06%
Percent Overall		0.54%	0.85%	0.92%	0.77%

County	Type	2012	2013	2014	Total
Bedford	C5	\$8,825.60	\$6,591.64	\$6,493.80	\$21,911.04
Blair	C5	\$52,953.64	\$39,549.87	\$38,962.83	\$131,466.34
Cambria	C5	\$44,128.04	\$32,958.23	\$38,962.83	\$116,049.10
Cameron	C5	\$97,081.68	\$72,508.10	\$103,900.90	\$273,490.68
Columbia	C5	\$17,651.21	\$13,183.29	\$12,987.61	\$43,822.11
Crawford	C5	\$0.00	\$19,774.93	\$19,481.41	\$39,256.34
Forest	C5	\$26,476.82	\$92,283.04	\$116,888.51	\$235,648.37
Huntingdon	C5	\$8,825.60	\$6,591.64	\$6,493.80	\$21,911.04
Lackawanna	C5	\$8,825.60	\$6,591.64	\$6,493.80	\$21,911.04
Mercer	C5	\$0.00	\$26,366.58	\$168,838.96	\$195,205.54
Venango	C5	\$8,825.60	\$26,366.58	\$32,469.03	\$67,661.21
Warren	C5	\$17,651.21	\$13,183.29	\$19,481.41	\$50,315.91
C5 Totals		\$291,245.00	\$355,948.83	\$571,454.89	\$1,218,648.72
Percent County		0.76%	0.96%	1.34%	1.04%
Percent Overall		0.29%	0.36%	0.50%	0.39%

Data Source: Pennsylvania Public Utility Commission.

Analysis of Municipalities

A total of \$195,363,547.33 was dispersed to municipalities in 2012, 2013 and 2014 (for production years 2011, 2012 and 2013). Of this total, \$140,891,259.80, or 72.12 percent, went to the 274 municipalities in the six C1 counties. Of the total going to all 274 C1 municipalities, \$119,541,201.50 went to 154 M1 municipalities, or municipalities with spud wells within their jurisdiction. The amount of impact fee monies going to C1M1 municipalities accounted for 61.19 percent of total municipal distributions, and 38.18 percent of total UGW distributions. The total for the 239 municipalities within C2 counties was \$30,053,583.94, or 15.38 percent of total municipal disbursements, and 9.60 percent of total UGW disbursements (See Table 3 for all municipal disbursements). The significant differential in

disbursements between M1 and M2 municipalities, overall, despite the ratios of the number of municipalities, is a function of the Act 13 formula to determine disbursements.

C/M Type	Number of Municipalities	60% Spud 2012	60% Spud 2013	60% Spud 2014	Total 2012-2014
C1M1	154	\$38,224,025.54	\$38,282,086.55	\$43,035,089.41	\$119,541,201.50
C1M2	111	\$6,558,712.01	\$6,624,827.53	\$7,745,483.81	\$20,929,023.35
C1M3	9	\$125,144.65	\$136,481.50	\$159,408.80	\$421,034.95
C2M1	82	\$7,565,259.66	\$7,197,106.10	\$8,849,700.18	\$23,612,065.94
C2M2	150	\$2,031,262.86	\$1,946,391.16	\$2,349,584.96	\$6,327,238.98
C2M3	7	\$37,114.03	\$32,069.25	\$45,095.74	\$114,279.02
C3M1	75	\$5,007,397.54	\$4,314,375.37	\$4,631,517.21	\$13,953,290.12
C3M2	113	\$1,269,952.08	\$1,038,657.63	\$1,065,693.62	\$3,374,303.33
C3M3	36	\$249,673.47	\$201,833.81	\$164,998.57	\$616,505.85
C4M1	43	\$666,474.74	\$998,536.96	\$1,243,898.17	\$2,908,909.87
C4M2	168	\$264,872.57	\$418,357.87	\$517,457.69	\$1,200,688.13
C4M3	119	\$41,425.58	\$71,346.73	\$85,765.27	\$198,537.58
C5M1	37	\$363,829.98	\$468,033.62	\$738,935.43	\$1,570,799.03
C5M2	167	\$120,779.13	\$133,539.19	\$238,450.02	\$492,768.34
C5M3	216	\$33,155.15	\$31,218.66	\$38,527.53	\$102,901.34
Total	1487	\$62,559,078.99	\$61,894,861.93	\$70,909,606.41	\$195,363,547.33

Data Source: Pennsylvania Public Utility Commission.

County and Municipal Allocation of Act 13 Impact Fee Revenues

Act 13 requires counties and municipalities receiving 60 percent spud monies to submit annual usage reports indicating how they have used or intend to use these resources according to the 13 specific categories. These reports are posted online by the PUC and are available for public review, and counties and municipalities are required to post the information as well. Act 13 provides for no separate reporting or auditing beyond the submission of the usage reports, and counties are not required to engage in any kind of reporting of the Legacy monies that they receive. Table 4 shows the aggregate 3-year totals by approved spending category of counties and municipalities combined.

Category	Amount
Amount Not Reported	\$33,777,337.42
Public Infrastructure Construction	\$82,907,684.40
Storm Water/Sewer Systems	\$5,242,569.22
Emergency Preparedness/Public Safety	\$38,047,020.14
Environmental Programs	\$2,723,476.15
Water Preservation and Reclamation	\$55,346.30
Tax Reductions	\$2,496,342.96
Housing	\$1,450,000.00
Information Technology	\$7,692,644.30
Social Services	\$3,953,831.08
Judicial Services	\$4,399,939.19
Capital Reserve Fund	\$129,168,835.03
Career and Technical Centers	\$270,449.96
Planning Initiatives	\$919,814.59
Total:	\$313,105,290.74

Data Source: Pennsylvania Public Utility Commission.

The “Amount Not Reported” category is not one of the 13 designated categories in Act 13, and PUC uses the category in one of two ways. First, counties or municipalities not submitting a usage report for a given reporting year have their distributions recorded by the PUC as “not reported.” Secondly, if a county or municipality submits a usage report and the report is incorrect, that county or municipality has its entire allocation recorded as “not reported.” Of the \$33,777,337.42 recorded as “not reported,” \$4,187,500.25 is attributable to the 37 counties, with nearly the entire county total amount being recorded for the 2011 production year. The municipal total of \$29,589,837.17 represents 15.15 percent of the total 3-year municipal allocation (to 1,487 municipalities), with \$16,118,224.12 recorded in 2012, \$4,340,861.85 recorded in 2013 and \$9,130,751.20 recorded in 2014.

Analysis of Counties

Over the 3 allocation years, as reported, the top three county allocation categories were Capital Reserve, Emergency Preparedness and Public Safety, and Public Infrastructure. The 37 counties, in aggregate, reported allocating 51.43 percent to Capital Reserve, 18.06 percent to Emergency Preparedness and Public Safety, and 9.62 percent to Public Infrastructure (Table 5). According to Act 13, monies allocated to Capital Reserve are to subsequently be used for one or more of the established designated

uses. Since Act 13 does not include separate reporting and accounting requirements of funds designated as Capital Reserve, the researchers note that the overall analysis is impacted by the variability of this category. Furthermore, a number of counties (and municipalities) reported in their survey responses as using and approaching “reserve” resources as “investment” resources, either saving or leveraging these resources in pursuit of specific goals.

	Total Allocations	Percent
Amount Not Reported	\$4,187,500.25	3.56%
Public Infrastructure	\$11,323,861.94	9.62%
Water and Sewer	\$1,078,101.60	0.92%
Emergency and Public Safety	\$21,269,865.52	18.06%
Environmental Programs	\$797,632.88	0.68%
Water Reclamation	\$13,296.00	0.01%
Tax Reductions	\$1,817,128.91	1.54%
Housing	\$1,270,000.00	1.08%
Information Technology	\$7,299,845.36	6.20%
Social Services	\$3,794,650.46	3.22%
Judicial Services	\$3,904,313.75	3.32%
Capital Reserve	\$60,556,141.57	51.43%
Career and Technical Centers	\$215,000.00	0.18%
Planning Initiatives	\$214,405.17	0.18%
Total Reported Allocations	\$117,741,743.41	

Data Source: Pennsylvania Public Utility Commission.

Identifiable patterns emerged when examining the allocations across the 3 reporting years, and when examining the allocations across the various county typologies. Table 6 provides a breakdown of annual aggregate county spending and percentages. While Capital Reserve remains the single largest annual allocation category all 3 years, spending in 2013 and 2014 on Emergency Preparedness and Public Safety increased noticeably, as did expenditures on Public Infrastructure and Construction. Also noticeable are increases in allocations for Information Technology. It would be reasonable to suggest at this level of examination (only the self-reporting PUC data) that as local government officials and communities made more specific allocation decisions as they became more familiar with Act 13 and the impacts of Marcellus activity in their areas.

Table 6: Annual Aggregate County Spending by Category 2012-2014

Category	2012	%	2013	%	2014	%
Amount Not Reported	\$4,174,512.64	10.92%	\$0.00	0.00%	\$12,987.61	0.03%
Public Infrastructure Construction	\$2,858,555.54	7.48%	\$3,764,894.82	10.18%	\$4,700,411.58	11.05%
Storm Water/Sewer Systems	\$8,825.60	0.02%	\$805,000.00	2.18%	\$264,276.00	0.62%
Emergency Preparedness/Public Safety	\$5,255,426.58	13.74%	\$8,017,566.32	21.69%	\$7,996,872.62	18.80%
Environmental Programs	\$157,651.21	0.41%	\$285,411.87	0.77%	\$354,569.80	0.83%
Water Preservation and Reclamation	\$0.00	0.00%	\$3,296.00	0.01%	\$10,000.00	0.02%
Tax Reductions	\$1,052,424.21	2.75%	\$376,933.29	1.02%	\$387,771.41	0.91%
Housing	\$330,000.00	0.86%	\$740,000.00	2.00%	\$200,000.00	0.47%
Information Technology	\$1,770,763.50	4.63%	\$2,167,766.40	5.86%	\$3,361,315.46	7.90%
Social Services	\$1,052,601.87	2.75%	\$1,537,584.20	4.16%	\$1,204,464.39	2.83%
Judicial Services	\$635,000.00	1.66%	\$581,350.95	1.57%	\$2,687,962.80	6.32%
Capital Reserve Fund	\$20,865,598.64	54.56%	\$18,576,147.97	50.25%	\$21,114,394.96	49.64%
Career and Technical Centers	\$0.00	0.00%	\$110,000.00	0.30%	\$105,000.00	0.25%
Planning Initiatives	\$80,000.00	0.21%	\$0.00	0.00%	\$134,405.17	0.32%
Total	\$38,241,359.79		\$36,965,951.82		\$42,534,431.80	

Data Source: Pennsylvania Public Utility Commission.

After examining the various county typologies, the research revealed additional identifiable patterns. For example, Capital Reserve accounted for 51.43 percent of county spending in aggregate. However, among C1 counties, it represented 56.92 percent, or \$49,525,337.31, of their allocations, with Bradford, Susquehanna and Tioga counties accounting for \$42,892,058.65 or 86.61 percent. Among C2 counties, Capital Reserve represented 36.66 percent, or \$6,196,900.73 of allocations and for the remaining C3 through C5 counties, it represented 31.61 percent, 51.82 percent and 29.35 percent respectively. While only Greene County (C1) and Clearfield County (C2) reported no Capital Reserve for any of the 3 allocation years, eight C3-C5 counties reported no Capital Reserve, and three counties did not report Capital Reserve for 2 out of 3 years. Table 7 provides the allocation percentages for Capital Reserve, Emergency Preparedness and Public Safety, and Public Infrastructure by county type.

Table 7: County 3-Year Total Spending by County Type for Capital Reserve, Emergency and Public Safety, and Public Infrastructure

	Capital Reserve	Emergency and Public Safety	Public Infrastructure	Total Reported Allocations
Total County	\$60,556,141.57	\$21,269,865.52	\$11,323,861.94	\$117,741,743.41
Percent	51.43%	18.06%	9.62%	
C1 Counties	\$49,525,337.31	\$10,202,731.44	\$9,789,728.97	\$87,008,068.26
Percent	56.92%	11.73%	11.25%	
C2 Counties	\$6,196,900.73	\$6,937,253.97	\$991,757.91	\$16,905,149.76
Percent	36.66%	41.04%	5.87%	
C3 Counties	\$3,220,316.90	\$3,191,765.45	\$392,675.54	\$10,186,540.67
Percent	31.61%	31.33%	3.85%	
C4 Counties	\$1,255,858.41	\$669,181.76	\$63,987.84	\$2,423,336.00
Percent	51.82%	27.61%	2.64%	
C5 Counties	\$357,728.22	\$268,932.90	\$85,711.68	\$1,218,648.72
Percent	29.35%	22.07%	7.03%	

Data Source: Pennsylvania Public Utility Commission.

In the category Emergency Preparedness and Public Safety, the overall allocation percentage was 18.06 percent: C1 counties allocated 11.73 percent, or \$10,202,731.44; C2 counties allocated \$6,937,253.97 or 41.04 percent; C3 counties allocated \$3,191,765.45 or 31.33 percent; and C4 and C5 counties allocated 27.61 percent and 22.07 percent, respectively. For all categories of counties other than C1, Emergency Preparedness and Public Safety represented a much greater percentage of their allocations. This was, however, not universal within all categories in terms of an annual commitment. While four out of the six C1 counties, all of the C2 counties, and five out of the eight C3 counties allocated monies here at least 2 out of the 3 years, the C4 and C5 counties did not. Nonetheless, Emergency Preparedness and Public Safety emerged here, and will again within the survey data, as one of the top two allocation categories.

The category of Public Infrastructure, though aggregately the third highest allocation total, was driven – in terms of percentages – almost entirely by the allocations of the C1 counties. Overall allocations in this category were \$11,323,861.94, of which \$9,789,728.97 was allocated by C1 counties, and which represented 11.25 percent of total C1 spending. C2 counties allocated just 5.87 percent of their total

allocations, or \$991,757.91, to Public Infrastructure, with C3, C4 and C5 counties allocating 3.85 percent, 2.64 percent and 7.03 percent, respectively. Here, too, however, overall percentages do not provide a complete representation. Three of the six C1 counties reported no allocations to Public Infrastructure for any of the 3 years, with Greene, Lycoming and Washington accounting for the entire \$9,789,728.97. Three of five C2 counties, six of eight C3 counties, five of six C4 counties, and nine of 12 C5 counties reported no allocations to Public Infrastructure for any of the 3 reporting years. Despite the data at this level, the survey data will show Public Infrastructure as one of the top two allocation categories.

In addition to examining county allocations across county typologies and across allocation categories, the researchers compared six spending categories with county and municipal profile data generated by the Center for Rural Pennsylvania (2015) to measure any statistical relationship between the two sets of data. The six spending categories were Capital Reserve, Emergency Preparedness and Public Safety, Public Infrastructure, Information Technology, Judicial Services and Social Services. All six were analyzed relative to: estimated population (2012); percent change in population (2010-2012); population per square mile; number of urban municipalities; 3-year unemployment average (2011-2013); serious crimes per 100,000 population (2012); total miles of highway (2011); and percent of local highways. Correlations for all spending categories and all profile data categories included the entire population of 37 counties, and the subset C1 and C2 county typology groups.

The analysis did not find any strong relationship for the aggregated 37-county population. In the C1 subgroup, however, several potentially significant correlations arose. The first two involved Information Technology and Social Services and the potential correlation with population and number of urban municipalities. In both cases there were strong positive correlations, with both Lycoming and Washington counties allocating far more in these two categories, and also having larger and more urban, populations. The third was in the area of Emergency Preparedness and Public Safety and the potential correlation with crime rates. In this particular case, there was a modestly strong correlation, driven by the allocations of Bradford, Lycoming and Washington counties, all of which had higher crime profiles than the other three C1 counties. Finally, in the C2 typology, there was a fairly strong and positive correlation in terms of

Emergency Preparedness and Public Safety, population and number of urban municipalities. Here the dynamics were driven by Fayette, Butler and Westmoreland counties, each of which has significantly higher populations and numbers of urban municipalities than either Clearfield or Wyoming counties. In all cases, however, the analyses were merely suggestive and not definitive given the nature of both the reporting of the PUC data, and the statistical method employed.

Survey data were also gathered and examined to augment the secondary PUC data. Surveys were sent to all 37 Marcellus counties, with a total of 16 responses available for analysis for an overall response rate of 43 percent.⁵ The 16 responses were evenly distributed over the five county typologies, with four C1 counties responding (Greene, Lycoming, Susquehanna, and Washington), three C2 counties (Fayette, Westmoreland, and Wyoming), three C3 counties (Armstrong, Clinton, and McKean), two C4 counties (Jefferson and Lawrence), and four C5 counties (Blair, Columbia, Forest, and Warren) responding. While the overall response rate of 43 percent is a strong response rate, allowing for a strong discussion at the overall county level, the response rates within each county category (C1 = 66.6 percent; C2 = 60 percent; C3 = 37.5 percent; C4 = 33.3 percent; and C5 = 33.3 percent) and the overall number of counties in those categories limited the strength of the survey data with respect to the individual categories.

Respondents were asked to rank the top three uses to which they were allocating Act 13 revenues based on the annual usage report, and were given the option of indicating only one or two if appropriate (See Table 8). Respondents were also asked to provide examples of projects within allocation priorities. Among the 16 respondents, Emergency Preparedness and Public Safety, Public Infrastructure, and Social Services were the categories receiving the most “top three” indicators. Given the 16 counties responding to the survey, this survey data, when compared to the data from the annual usage reports, serve to support several of the patterns previously identified by the research.

First, the PUC data indicated that C1 counties allocated 11.73 percent in the Emergency Preparedness and Public Safety category, while C2 counties allocated 41.04 percent and C3 counties allocated 31.33 percent, suggesting a higher prioritization in the C2 and C3 counties. In the survey data, of the nine

⁵ With $n=16$ and $N=37$, and with a p of .5, the 95 percent confidence interval margin of error was 18.71 for the overall county survey set.

responses prioritizing Emergency Preparedness and Public Safety, five were generated by either C2 or C3 counties. Examples of priority projects in this category cited by C2 and C3 counties were: 911 centers and costs associated with upgrading and training, public safety, and sheriff's departments. Both the PUC data and survey data would seem to suggest a pattern of prioritization in this category for the C2 and C3 counties. In the categories of Public Infrastructure and Storm Water/Sewer Systems, of the combined seven reported prioritizations, four came from C1 counties, with written responses that included replacing county bridges, repairing county roads, connecting water and sewer services, and replacing/repairing county owned bridges. Again, both the PUC data and survey data would seem to suggest a pattern of prioritization in this category for the C1 counties.

Category	#1	#2	#3	Total
Public Infrastructure Construction	3	1	2	6
Storm Water/Sewer Systems	1	0	0	1
Emergency Preparedness/Public Safety	4	5	0	9
Environmental Programs	2	2	0	4
Water Preservation and Reclamation	0	0	0	0
Tax Reductions	2	0	0	2
Housing	0	0	1	1
Information Technology	1	2	1	4
Social Services	2	1	3	6
Judicial Services	1	0	2	3
Capital Reserve.	0	0	0	0
Career and Technical Centers	0	1	1	2
Planning Initiatives	0	2	2	4
Total Responses (N) = 16	16	14	12	

Data Source: Survey of Counties.

Given the nature of the Capital Reserve category, the survey asked respondents to indicate their top three uses and any future intended uses of Capital Reserve resources (See Tables 9 and 10). Though no commanding pattern emerged, the current and future priorities of Emergency Preparedness and Public Infrastructure may be identified.

Category	#1	#2	#3	Total
Public Infrastructure Construction	2	2	0	4
Storm Water/Sewer Systems	0	0	0	0
Emergency Preparedness/Public Safety	2	2	1	5
Environmental Programs	2	2	0	4
Water Preservation and Reclamation	0	0	0	0
Tax Reductions	2	0	1	3
Housing	0	1	0	1
Information Technology	1	1	0	2
Social Services	2	1	0	3
Judicial Services	0	0	2	2
Career and Technical Centers	0	0	0	0
Planning Initiatives	1	1	0	2
Total Responses (N) = 12	12	10	4	

Data Source: Survey of Counties.

Category	#1	#2	#3	Total
Public Infrastructure Construction	4	0	1	5
Storm Water/Sewer Systems	0	1	0	1
Emergency Preparedness/Public Safety	2	3	3	8
Environmental Programs	1	2	0	3
Water Preservation and Reclamation	0	0	0	0
Tax Reductions	2	0	0	2
Housing	0	0	0	0
Information Technology	1	0	2	3
Social Services	1	2	0	3
Judicial Services	0	1	1	2
Career and Technical Centers	0	0	0	0
Planning Initiatives	0	1	0	1
Total Responses (N) = 11	11	10	7	

Data Source: Survey of Counties.

Finally, survey respondents were asked how they used Legacy Funds. Fourteen of the total 16 respondents provided responses, which included conservation district and farmland preservation, streetscape design plan, developing, upgrading and maintaining recreational facilities, supporting nature-based and agricultural education programs.

Analysis of Municipalities

Over the 3 allocation years, the top three municipal allocation categories, not including Amount Not Reported, were Public Infrastructure, Capital Reserve, and Emergency Preparedness and Public Safety. As shown in Table 11, the 1,487 municipalities in aggregate reported allocating 36.64 percent to Public Infrastructure, 35.12 percent to Capital Reserve, and 8.59 percent to Emergency Preparedness and Public Safety. Additionally, 2.13 percent was allocated to Storm Water and Sewer Systems, with all other categories under 1.00 percent.

Category	Amount	Percent
Amount Not Reported	\$29,589,837.17	15.15%
Public Infrastructure Construction	\$71,583,822.46	36.64%
Storm Water/Sewer Systems	\$4,164,467.62	2.13%
Emergency Preparedness/Public Safety	\$16,777,154.62	8.59%
Environmental Programs	\$1,925,843.27	.99%
Water Preservation and Reclamation	\$42,050.30	.02%
Tax Reductions	\$679,214.05	.35%
Housing	\$180,000.00	.09%
Information Technology	\$392,798.94	.20%
Social Services	\$159,180.62	.08%
Judicial Services	\$495,625.44	.25%
Capital Reserve Fund	\$68,612,693.46	35.12%
Career and Technical Centers	\$55,449.96	.03%
Planning Initiatives	\$705,409.42	.36%
Total Reported Allocations	\$195,363,547.33	

Data Source: Pennsylvania Public Utility Commission.

Identifiable trends began to emerge across the 3 reporting years, and across the various typologies. Table 12 provides a breakdown of reported annual aggregate municipal spending and percentages.

In the case of Capital Reserve, reported allocations decreased significantly over the 3 years, from a high of 45.78 percent in 2012, to 32.74 percent in 2013 and 27.79 percent in 2014. Emergency Preparedness and Public Safety increased from 6.19 percent in 2012 to 10.62 percent in 2013 and 8.93 percent in 2014. Most significant, however, were the increase in allocations in Public Infrastructure and Construction from 18.96 percent, or \$11,860,317.23, in 2012 to 43.54 percent, or \$26,948,667.15, in 2013 and to 46.22 percent, or \$32,774,838.08, in 2014. It would be reasonable to suggest that as local

government officials and communities became more familiar with Act 13 and the impacts of Marcellus activity in their areas, they were able to make specific allocation decisions.

Category	2012	%	2013	%	2014	%
Amount Not Reported	\$16,118,224.12	25.76%	\$4,340,861.85	7.01%	\$9,130,751.20	12.88%
Public Infrastructure Construction	\$11,860,317.23	18.96%	\$26,948,667.15	43.54%	\$32,774,838.08	46.22%
Storm Water/Sewer Systems	\$915,384.27	1.46%	\$1,883,744.10	3.04%	\$1,365,339.25	1.93%
Emergency/Public Safety	\$3,873,128.98	6.19%	\$6,571,440.42	10.62%	\$6,332,585.22	8.93%
Environmental Programs	\$672,302.27	1.07%	\$725,817.95	1.17%	\$527,723.05	0.74%
Water Preservation	\$0.00	0.00%	\$4,000.00	0.01%	\$38,050.30	0.05%
Tax Reductions	\$203,735.03	0.33%	\$284,009.27	0.46%	\$191,469.75	0.27%
Housing	\$50,000.00	0.08%	\$90,000.00	0.15%	\$40,000.00	0.06%
Information Technology	\$60,660.40	0.10%	\$121,095.60	0.20%	\$211,042.94	0.30%
Social Services	\$73,637.79	0.12%	\$66,912.48	0.11%	\$18,630.35	0.03%
Judicial Services	\$11,103.65	0.02%	\$467,520.14	0.76%	\$17,001.65	0.02%
Capital Reserve Fund	\$28,636,514.45	45.78%	\$20,267,123.09	32.74%	\$19,709,055.92	27.79%
Career and Technical Centers	\$0.00	0.00%	\$0.00	0.00%	\$55,449.96	0.08%
Planning Initiatives	\$84,070.80	0.13%	\$123,669.88	0.20%	\$497,668.74	0.70%
Total	\$62,559,078.99		\$61,894,861.93		\$70,909,606.41	

Data Source: Pennsylvania Public Utility Commission.

When examined across the various municipal typologies, unlike the counties, the researchers found little variation across typologies relative to spending categories. In the case of Capital Reserve allocations, the three municipal types within the C1, C2 and C3 counties ranged in allocation percentages of 22.86 percent to 41.20 percent, with the remaining seven ranged between 27.31 percent and 36.15 percent. There was little identifiable difference until the C4 and C5 categories, where the M1 municipal types had significantly higher allocation percentages than the rest.

Table 13 provides municipal allocation amounts and percentages (by total type allocations) for Public Infrastructure, Emergency Preparedness and Public Safety, and Storm Water and Sewer. But for several of the M3 categories, little significant difference emerged. The overall trend in municipal allocation was to Public Infrastructure and Emergency Preparedness and Public Safety across all municipal types.

C/M Type	Public Infrastructure	% of Type Total	Emergency/ Public Safety	% of Type Total	Storm Water/ Sewer	% of Type Total
C1M1	\$43,592,611.00	36.47	\$11,296,437.38	9.45	\$2,248,668.18	1.88
C1M2	\$6,842,494.27	32.69	\$1,326,992.95	6.34	\$1,117,674.14	5.34
C1M3	\$42,425.87	10.08	\$20,024.07	4.76	\$0.00	0.00
C2M1	\$9,287,173.71	39.33	\$1,540,106.93	6.52	\$344,079.75	1.46
C2M2	\$2,808,305.80	44.38	\$559,866.75	8.85	\$152,966.70	2.42
C2M3	\$4,024.19	3.52	\$43,872.76	38.39	\$4,987.68	4.36
C3M1	\$5,649,178.46	40.49	\$1,235,769.87	8.86	\$151,023.73	1.08
C3M2	\$1,006,903.12	29.91	\$366,528.82	10.89	\$61,136.37	1.82
C3M3	\$220,466.13	35.32	\$48,918.22	7.84	\$5,364.53	.86
C4M1	\$846,606.73	29.10	\$147,611.67	5.07	\$9,265.75	.32
C4M2	\$479,405.93	39.93	\$64,045.77	5.33	\$18,941.75	1.58
C4M3	\$31,896.20	16.07	\$29,801.72	15.01	\$6,593.27	3.32
C5M1	\$593,928.98	37.81	\$51,235.05	3.26	\$24,869.90	1.58
C5M2	\$150,643.99	30.57	\$42,930.73	8.71	\$14,008.61	2.84
C5M3	\$28,758.08	27.95	\$3,011.92	2.93	\$4,887.26	4.75
Total	\$71,584,822.46		\$16,777,154.62		\$4,164,467.62	

Data Source: Pennsylvania Public Utility Commission.

The researchers also compared the spending categories with county and municipal demographic profile data from the Center for Rural Pennsylvania (2015). The spending categories of Public Infrastructure, Emergency Preparedness and Public Safety, and Storm Water and Sewer were compared to: municipal population (2012); population per square mile (2010); county serious crimes per 100,000 population (2012); total county miles of highway (2011); and percent of local highways. Correlations were made on the entire population of 1,487 municipalities, and then on the C1M1, C1M2 and C2M1 subsets. The analysis found no significant correlations.

Municipal survey data were also gathered. Surveys were sent to all 1,487 municipalities located within Marcellus activity counties. A total of 562 surveys were returned for a response rate of 38 percent.⁶ Of the responses, 376 (67 percent) were received from townships, 177 from boroughs (31 percent), and nine from cities (2 percent). The survey respondents were evenly distributed (See Table 14). The greater number of surveys from the C5 counties is a function of there being 11 C5 counties.

⁶ With n=562 and N=1,487, and with a p of .5, the 95 percent confidence interval margin of error was 3.26 for the overall municipal survey set.

Type	Total Townships	Total Boroughs	Total Cities	Total Municipalities	% of Total
C1	67	22	0	89	15.84%
C2	58	29	2	89	15.84%
C3	67	25	1	93	16.55%
C4	66	49	3	118	21.00%
C5	118	52	3	173	30.78%
Total	376	177	9	562	

Data Source: Survey of Municipalities.

Municipal respondents also were asked to rank the top three uses of Act 13 revenues and were given the option of indicating only one or two, if appropriate. Respondents were also asked to provide examples of projects within allocation priorities. Among the 562 respondents, 512 valid responses were available. Public Infrastructure was ranked number one, followed by Emergency Preparedness and Public Safety, and Storm Water and Sewer Systems (See Table 15). The municipal survey data, when compared to the PUC annual usage reports data, served to support the ranking of Public Infrastructure and Construction as the overwhelming priority for municipalities.

Category	#1	#2	#3	Total
Public Infrastructure Construction	328	55	12	395
Storm Water/Sewer Systems	28	67	23	118
Emergency Preparedness/Public Safety	58	50	31	139
Environmental Programs	11	16	11	38
Water Preservation and Reclamation	0	1	5	6
Tax Reductions	1	7	4	12
Housing	0	2	0	2
Information Technology	6	3	4	13
Social Services	2	1	3	6
Judicial Services	2	0	0	2
Capital Reserve	74	34	30	138
Career and Technical Centers	0	0	0	0
Planning Initiatives	2	0	0	2
Total Responses (N) = 512	512	236	123	

Data Source: Survey of Municipalities.

In addition to the 512 categorical ranking responses received, 387 responses were received providing examples of how municipalities were allocating funds. These responses were analyzed using text analysis software to identify broad themes (See Table 16). In the table, the more general themes are on the right, followed by the frequency of theme and more specific attributes associated with the theme. Public Infrastructure was again identified as a priority.

Facet	Facets Count	Attribute	Attributes Count	Theme	Themes Count
Road	36	future	2	road repair	14
Road	36	gravel	2	road maintenance	12
Road	36	township	12	township road	11
Road	36	resurface	2	capital reserve	10
Fund	23	general	6	dump trucks	8
Equip	13	new	9		
Money	13	road	2		
Township	13	new	2		
Amount	11	small	8		
Truck	11	plow	2		
Truck	11	heavy	3		
Truck	11	new	3		
Repair	8	road	2		
Fire	7	local	4		
Police	6	new	2		
Project	6	future	2		
Safety	6	public	6		

Data Source: Survey of Municipalities.

With respect to the use of Capital Reserve, the survey data indicated that the municipal spending priority is in the area of Public Infrastructure. Tables 17 and 18 provide the breakdown of municipal responses in regard to Capital Reserve allocations. In terms of both past and intended fund allocations, Public Infrastructure received the overwhelming number of “top priority” uses.

Category	#1	#2	#3	Total
Public Infrastructure Construction	229	34	6	269
Storm Water/Sewer Systems	25	43	9	77
Emergency Preparedness/Public Safety	41	27	23	91
Environmental Programs	8	7	11	26
Water Preservation and Reclamation	0	0	2	2
Tax Reductions	2	6	3	11
Housing	0	1	0	1
Information Technology	3	1	3	7
Social Services	2	0	2	4
Judicial Services	0	0	0	0
Career and Technical Centers	0	0	0	0
Planning Initiatives	3	0	2	5
Total Responses (N) = 313	313	119	61	

Data Source: Survey of Municipalities.

Category	#1	#2	#3	Total
Public Infrastructure Construction	282	27	5	314
Storm Water/Sewer Systems	21	67	12	100
Emergency Preparedness/Public Safety	31	35	24	90
Environmental Programs	11	8	19	38
Water Preservation and Reclamation	0	0	2	2
Tax Reductions	1	8	3	12
Housing	0	1	0	1
Information Technology	4	1	4	9
Social Services	2	0	1	3
Judicial Services	0	0	0	0
Career and Technical Centers	0	0	0	0
Planning Initiatives	1	1	1	3
Total Responses (N) = 353	353	148	71	

Data Source: Survey of Municipalities.

In addition to the responses seen in Table 18, another 111 written responses were provided, and clearly indicated that road repair, road repair equipment, and supplies were top priorities.

Analysis of County and Municipal Financial Data

Analysis of Counties

The researchers examined county financial data⁷ to compare post Act 13⁸ resources on county expenditures. The analyses consisted of the C1, C2 and C3 counties (the most active of the Marcellus counties by far), as well as the rural Marcellus/rural non-Marcellus counties.

The first county-level analysis used eight financial reporting categories and data by generating averages⁹ for each of the Marcellus county groupings for 2007-2008, 2009-2011, and 2012-2013. The selected categories were: Total Expenditures; General Administrative; Judicial; Public Safety; Highways and Streets; Health and Welfare; Culture and Recreation; and Conservation. Percentage changes between time periods were generated to identify any rates of increase or decrease within the examined categories. The researchers also examined the percentage change between 2012 and 2013. Table 19a presents the analysis for the first four categories.

⁷ Figures were actual figures and were not adjusted for inflation (up or down) to any single year. The researchers believed that whatever individual county or municipal comparative examination might take place in the wake of the report would benefit from actual annual figures.

⁸ As mentioned earlier, given the timing of the disbursement of Act 13 resources, there would have been only potential impact on the 2012 and 2013 financial years.

⁹ The mean (average) was selected as opposed to the median after an initial review of the data suggested that annual changes in budgets were generally regular, with no significant outliers. Additionally, as the mean is more sensitive to deviations, it was felt that significant changes in the 2012-2013 data grouping would be more evident.

Table 19a: County Financial Report Analysis

	Governmental Funds - Total Expenditures	Governmental Funds - General Government- Administrative	Governmental Funds - General Government- Judicial	Governmental Funds - Public Safety
C1 Counties (6)				
2007-2008 Average	60,523,631.00	6,291,782.42	4,539,026.92	8,347,196.50
2009-2011 Average	54,379,733.56	6,723,773.33	4,587,421.61	8,363,106.17
% Change (7/8 - 9/11)	-10.15%	6.87%	1.07%	0.19%
2012 Average	55,102,113.00	6,512,248.50	5,833,886.00	9,052,146.33
2013 Average	50,185,268.33	7,194,618.67	6,010,085.83	8,431,858.00
2012-2013 Average	52,643,690.67	6,853,433.58	5,921,985.92	8,742,002.17
% Change (9/11 - 12/13)	-3.19%	1.93%	29.09%	4.53%
% Change (12 -13)	-8.92%	10.48%	3.02%	-6.85%
C2 Counties (5)				
2007-2008 Average	92,946,504.00	7,402,824.40	10,624,800.70	14,105,137.50
2009-2011 Average	90,569,689.27	8,055,245.20	11,859,398.33	14,099,260.80
% Change 1	-2.56%	8.81%	11.62%	-0.04%
2012 Average	86,930,526.20	8,755,001.20	12,811,160.80	14,527,137.60
2013 Average	79,305,949.40	8,936,400.00	12,515,800.20	15,343,149.00
2012-2013 Average	83,118,237.80	8,845,700.60	12,663,480.50	14,935,143.30
% Change 2	-8.23%	9.81%	6.78%	5.93%
% Change 3	-8.77%	2.07%	-2.31%	5.62%
C3 Counties (8)				
2007-2008 Average	34,616,255.13	5,077,884.19	3,588,658.56	6,137,300.94
2009-2011 Average	32,071,019.67	4,825,245.25	4,060,995.33	5,260,346.00
% Change 1	-7.35%	-4.98%	13.16%	-14.29%
2012 Average	37,489,828.88	4,737,113.25	4,405,454.00	5,406,980.00
2013 Average	32,071,630.75	4,699,046.13	4,258,066.13	3,560,534.75
2012-2013 Average	34,780,729.81	4,718,079.69	4,331,760.06	4,483,757.38
% Change 2	8.45%	-2.22%	6.67%	-14.76%
% Change 3	-14.45%	-0.80%	-3.35%	-34.15%

Data Source: DCED Annual Financial Data.

Within county types C1 and C2, there were overall decreases in reported total expenditures, and in the C3 type, a fairly level expenditure pattern. This does not hold true, however, for other individual expenditure categories. For example, while there was a modest reduction in general administrative expenditures for C3 counties, there were noticeable increases in both the C1 and C2 counties. Prior research efforts (Brasier et.al., 2014; Raimi and Newell, 2014a and b) identified the impact Marcellus activity has had, or may have had, in the area of general administration and staffing, and the above results would suggest some support for this conclusion. Furthermore, except for small decreases from 2012 to 2013, reported judicial expenditures also

demonstrated steady increases. This observation was generally consistent with prior research and was also consistent with the various roles counties play in the administration of justice, including both judicial and law enforcement functions, as well as the expected increase in activity related to Marcellus drilling. Finally, with respect to public safety expenditures, a mixed picture emerged, with C1 county expenditures appearing flat, C2 counties demonstrating a small increase, and C3 counties showing a reduction in public safety spending. Table 19b presents the remaining four categories.

Table 19b: County Financial Report Analysis				
	Governmental Funds- Highway and Streets	Governmental Funds- Health and Welfare	Governmental Funds- Culture- Recreation	Governmental Funds- Conservation
C1 Counties (6)				
2007-2008 Average	1,664,911.25	24,025,182.75	1,119,109.08	414,390.67
2009-2011 Average	667,657.94	22,210,760.89	877,250.39	487,295.00
% Change (7/8 - 9/11)	-59.90%	-7.55%	-21.61%	17.59%
2012 Average	606,978.50	21,881,805.83	719,940.33	752,950.50
2013 Average	1,075,056.67	14,184,148.67	733,549.00	546,981.67
2012-2013 Average	841,017.58	18,032,977.25	726,744.67	649,966.08
% Change (9/11 - 12/13)	25.97%	-18.81%	-17.16%	33.38%
% Change (12 -13)	77.12%	-35.18%	1.89%	-27.35%
C2 Counties (5)				
2007-2008 Average	811,108.80	25,782,219.90	940,979.50	237,570.50
2009-2011 Average	708,913.00	19,442,615.07	936,805.73	211,039.33
% Change 1	-12.60%	-24.59%	-0.44%	-11.17%
2012 Average	605,782.00	16,439,801.60	784,402.00	254,186.60
2013 Average	1,278,896.40	9,409,538.40	758,185.80	234,464.20
2012-2013 Average	942,339.20	12,924,670.00	771,293.90	244,325.40
% Change 2	32.93%	-33.52%	-17.67%	15.77%
% Change 3	111.11%	-42.76%	-3.34%	-7.76%
C3 Counties (8)				
2007-2008 Average	523,258.56	12,129,198.50	387,333.69	507,565.50
2009-2011 Average	335,488.33	9,348,318.29	397,966.63	770,988.79
% Change 1	-35.88%	-22.93%	2.75%	51.90%
2012 Average	253,075.00	8,215,041.00	445,084.13	790,397.63
2013 Average	956,069.63	6,962,667.13	386,484.75	756,290.13
2012-2013 Average	604,572.31	7,588,854.06	415,784.44	773,343.88
% Change 2	80.21%	-18.82%	4.48%	0.31%
% Change 3	277.78%	-15.24%	-13.17%	-4.32%

Data Source: DCED Annual Financial Data.

The data relative to these expenditure categories present a mixed picture. In terms of highway and street expenditures, there was a noticeable spike in expenditures for 2013, yet an earlier overall decrease in reported expenditures. This may be a function of the timing of the receipt of Act 13 resources. The most noticeable trend in the data can be found with expenditures on health and welfare: here the data suggest a clear, overall

and steady reduction in reported expenditures. While it was beyond the scope of this research, and quite possibly influenced by other governmental policy, reporting decisions, or demographic dynamics, the reported reductions in this area deserve further consideration since there is such variability in the types of functions reported in this category. Finally, except for 2013, there were modestly noticeable increases in conservation spending. However, given the timing of the receipt of Act 13 resources, a relational influence with respect to Act 13 would be difficult to discern.

The second county-level analysis compared rural Marcellus counties (the 37 Marcellus counties minus Allegheny, Beaver, Lackawanna and Westmoreland) to rural non-Marcellus counties¹⁰, though again, the results for just C1, C2 and C3 counties are reported. The data were organized into two tiers, one averaging 2009-2011 and the other averaging 2012-2013. Table 20a provides the first set of expenditure categories.¹¹

Table 20a: Rural Marcellus vs. Rural Non-Marcellus Analysis					
	Total Expenditures	General Administrative	Judicial	Public Safety	Highway and Streets
Non-Marcellus Rural					
2009-2011 Average	41,071,766.31	7,076,618.56	5,883,056.82	6,204,217.27	866,580.18
2012-2013 Average	40,661,437.27	6,037,120.70	6,238,162.20	5,408,974.90	784,474.60
% Change	-1.00%	-14.69%	6.04%	-12.82%	-9.47%
C1 Marcellus % Change	-3.19%	1.93%	29.09%	4.53%	25.97%
C2 Marcellus % Change	-8.23%	9.81%	6.78%	5.93%	32.93%
C3 Marcellus % Change	8.45%	-2.22%	6.67%	-14.76%	80.21%

Data Source: DCED Annual Financial Data.

The data here potentially revealed several significant trends. First, while general administrative expenditures dropped 14.69 percent between the two time period averages for the aggregated rural non-Marcellus counties, C1 and C2 counties saw an increase, again suggesting that Marcellus activity has increased the demand for administrative and personnel expenditures. Further, while rural non-Marcellus

¹⁰ The 15 designated rural counties used in this research were: Adams, Carbon, Franklin, Fulton, Juniata, Mifflin, Monroe, Montour, Northumberland, Perry, Pike, Schuylkill, Snyder, Union, and Wayne.

¹¹ The analysis did not attempt to control for the potential impact of significant deviations to such specific intergovernmental transfers as the liquid fuels tax on expenditure categories. Roughly 20 percent of total revenues reported for counties and municipalities were from transfers from the state. Combined fund transfers from the federal government and other municipalities equaled roughly 4 percent on average for both counties and municipalities. However, the percentage of funds transferred from these sources remained constant for the exam period, and indeed the standard deviation of the percent of transfers to total revenue from these sources was close to zero, and was considered not to affect inferences relative to the share analyses.

counties saw a 12.82 percent reduction in public safety expenditures, both C1 and C2 counties experienced modest increases. And perhaps most significantly, while rural non-Marcellus counties saw a 9.47 percent decrease in expenditures for highways and streets, all three Marcellus county types experienced significant increases.

Table 20b presents additional expenditure category data. Of note here are the expenditure patterns with respect to health and welfare. While rural non-Marcellus counties saw a modest reduction in reported spending, significant reductions occurred in all three Marcellus county types. As mentioned previously, while there may be many factors influencing this dynamic, it deserves additional exploration. Further, while reported expenditures on conservation dropped by 23.63 percent in rural non-Marcellus counties, noticeable increases were seen in the Marcellus counties. In all areas, there were significant reductions in reported expenditures on community redevelopment and housing, with a mixed presentation for economic development expenditures.

	Health and Welfare	Culture & Recreation	Conservation	Community Redevelopment and Housing	Economic Development and Assistance
Non-Marcellus Rural					
2009-2011 Average	13,256,950.89	959,258.64	1,553,345.89	238,031.00	105,576.24
2012-2013 Average	12,741,991.40	705,076.37	1,186,255.37	162,484.27	160,427.63
% Change	-3.88%	-26.50%	-23.63%	-31.74%	51.95%
C1 Marcellus % Change	-18.81%	-17.16%	33.38%	-50.09%	-64.81%
C2 Marcellus % Change	-33.52%	-17.67%	15.77%	-38.19%	25.28%
C3 Marcellus % Change	-18.82%	4.48%	0.31%	-38.94%	92.69%

Data Source: DCED Annual Financial Data.

The third county-level analysis used total annual spending figures for all rural Marcellus (represented by the dotted line) and all rural non-Marcellus (represented by the solid line) counties,¹² rather than using percentage averages. Figures 1, 2, 3, 4, and 5 present the spending trends, from 2007 to 2013, for Total

¹² The data were not adjusted for inflation. Here the primary rationale, however, was based on the very low CPI over the general period, coupled with several decreases during the timeframe.

Expenditures, General Administrative, Judicial, Public Safety, Highways and Streets, and Health and Welfare.

Figure 1: Administrative Expenditures

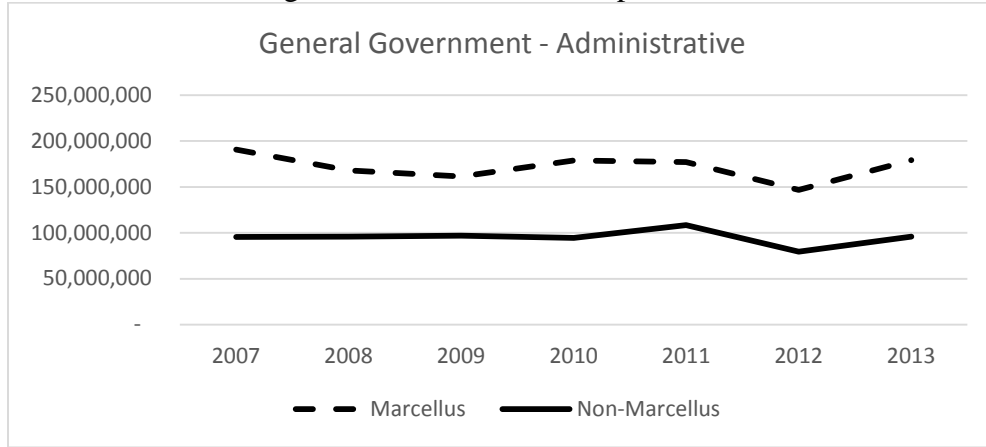


Figure 2: Judicial Expenditures

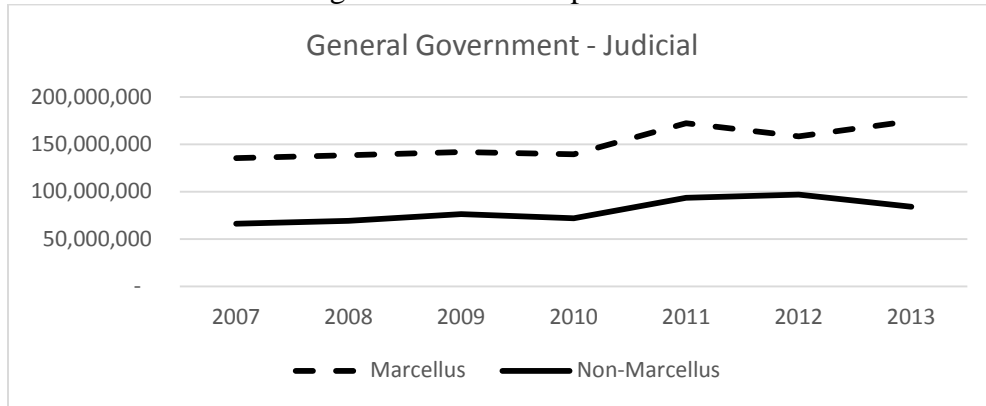


Figure 3: Highways and Streets Expenditures

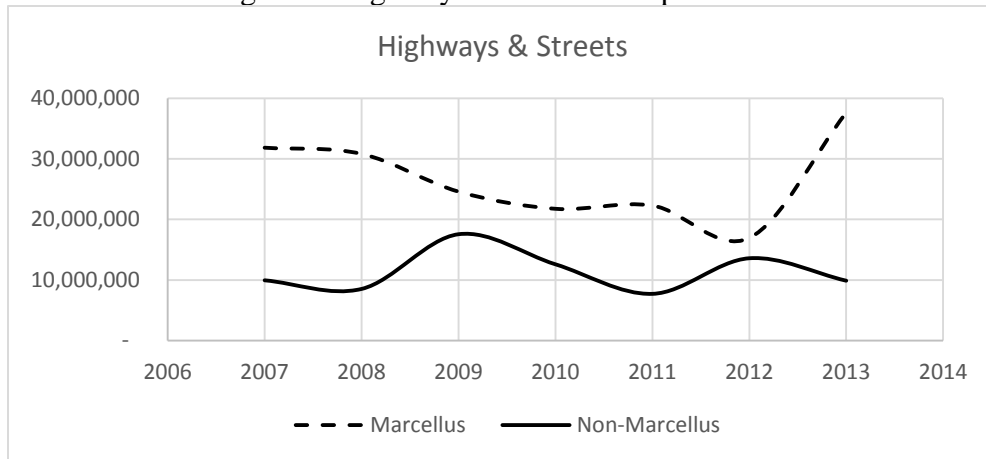


Figure 4: Health and Welfare

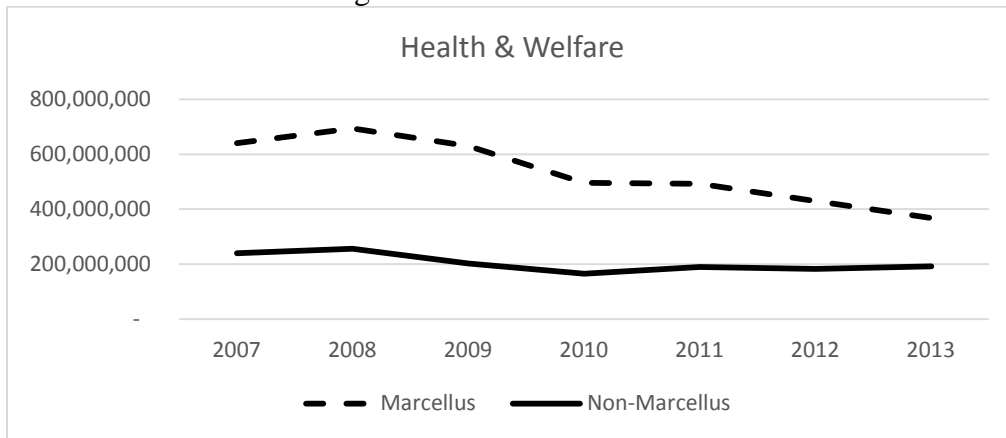
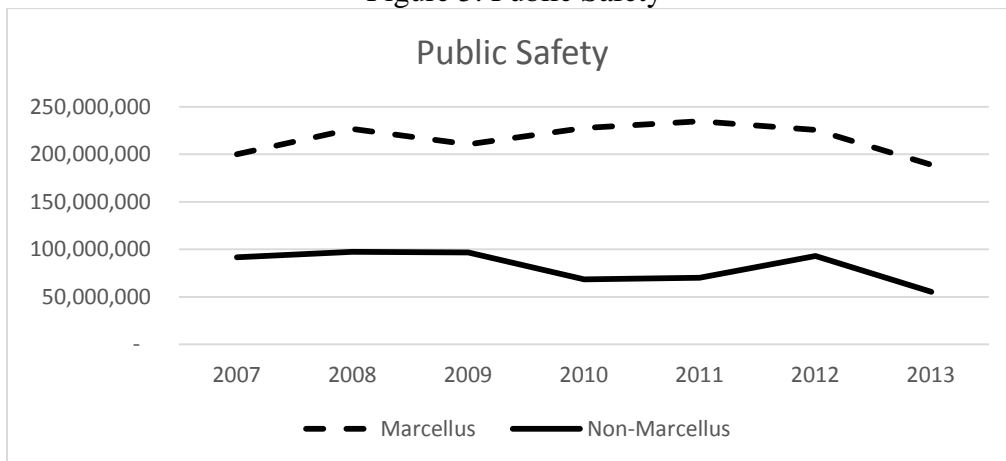


Figure 5: Public Safety



Taken together, the results so far suggest and support several observations regarding trends in county expenditure behavior and patterns. First is the emerging trend of increased expenditures in the area of public infrastructure (Highways and Streets). The second involves the position of Emergency Preparedness and Public Safety. While this category was indicated as a top priority in both the PUC data and the survey data, the trajectory of the annual financial expenditure data in the category of public safety do not seem to reflect this level of priority. As indicated earlier, this may be due to several factors, most potentially the way in which counties choose to post expenditures within the reporting structure, and therefore the degree to which this category captures all of the expenditures in this area. Third is the apparently steady increase in both judicial expenditures and general administrative expenditures.

The final county-level analysis involved examining selected expenditure categories relative to total county expenditures for C1, C2, and C3 Marcellus counties, and as compared to the aggregate of rural non-Marcellus counties. While this research has examined select categories of expenditures, it has done so relative to the dynamics of the categories themselves, and not in relation to overall expenditures. An examination of the relative share of an expenditure category offers yet another perspective on the relative priority of expenditures. Table 21 presents the percentage share of three expenditure categories – general administrative, judicial, and public safety – as a mean percentage for two chronological groupings: 2009-2011 and 2012 to 2013.

Table 21: Percent Shares Total Expenditures 2009-2011 & 2012-13

County Types	C1		C2		C3		NM	
	09-11	12-13	09-11	12-13	09-11	12-13	09-11	12-13
Gen Administrative	0.191	0.204	0.149	0.179	0.202	0.221	0.173	0.173
Judicial	0.131	0.154	0.207	0.229	0.160	0.173	0.181	0.193
Public Safety	0.224	0.214	0.233	0.285	0.216	0.224	0.186	0.166

Data Source: DCED Annual Financial Data.

With respect to general administrative expenditures, while the aggregate share of expenditures for this category remained the same between the two time periods for rural non-Marcellus counties, they increased for all three Marcellus county types. Judicial expenditures as a share of total expenditures increased for all county group types, and the results were mixed for public safety expenditures, with only the C2 counties demonstrating an increase in share from 23.3 percent to 28.5 percent and the rural non-Marcellus counties decreasing from 18.6 percent to 16.6 percent. Figures 6, 7 and 8 plot the percentage shares of each of the above categories, combining the C1, C2, and C3 county types (represented by the dotted line), and comparing the grouping to the rural non-Marcellus counties (represented by the solid line).

Figure 6: Annual Share General Administrative

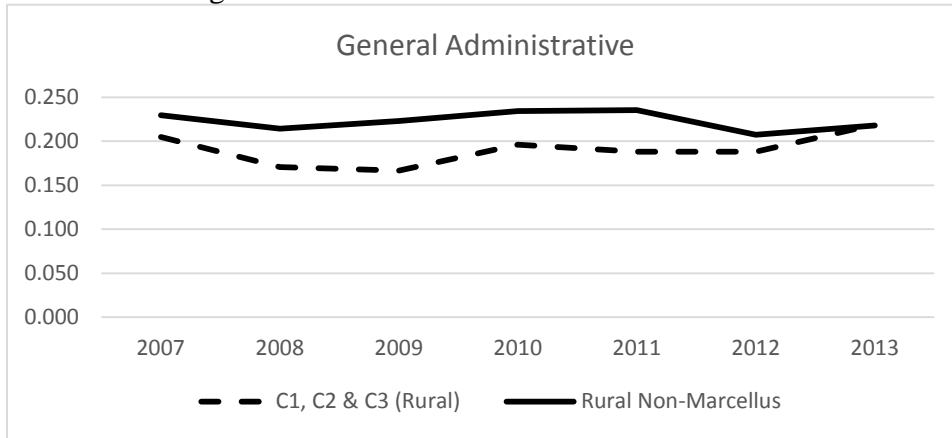


Figure 7: Annual Share Judicial

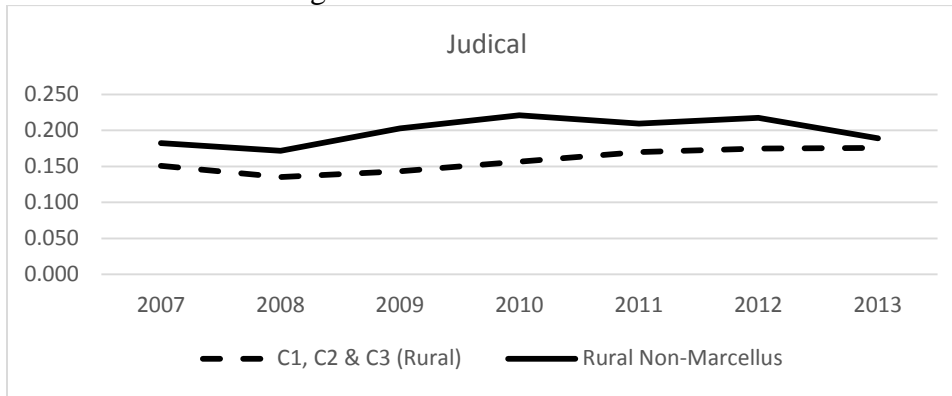
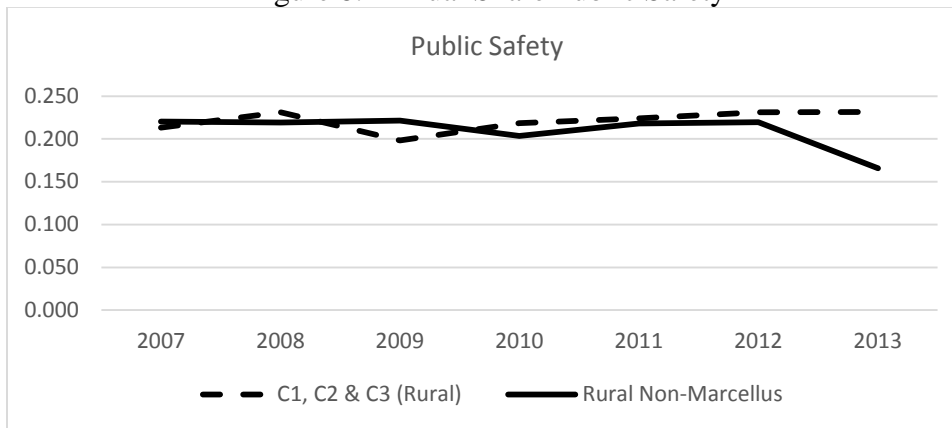


Figure 8: Annual Share Public Safety



Analysis of Municipalities

The first municipal-level analysis looked at select annual financial categories and data by generating averages for the C1M1, C1M2, C2M1, and C2M2 municipal groupings for 2008-2011 and 2012-2013. These four municipal types were selected because these municipalities received \$170,409,529.77, or 87.23 percent, of the total municipal disbursement of \$195,363,547.33. The financial reporting categories selected were: Total Expenditures; General Government Expenditures; Police; Health and Human Services; Public Works, Highways and Streets; and Culture and Recreation (See Tables 22a and 22b).

Table 22a: Select Municipal Grouping Financial Report Analysis

	Total Expenditures	General Government Expenditures	Police Expenditures
C1M1 2008-2011 Average (N=592)	602,124.45	82,171.30	41,893.51
C1M1 2012-2013 Average (N=296)	875,314.38	100,733.60	50,402.96
% Difference	45.37%	22.59%	20.31%
C1M2 2008-2011 Average (N=416)	1,812,289.02	169,254.44	239,986.86
C1M2 2012-2013 Average (N=208)	2,222,792.89	172,477.03	274,816.76
% Difference	22.65%	1.90%	14.51%
C2M1 2008-2011 Average (N=314)	1,253,237.04	160,137.35	99,600.34
C2M1 2012-2013 Average (N=157)	1,339,341.89	155,885.82	106,595.96
% Difference	6.87%	-2.65%	7.02%
C2M2 2008-2011 Average (N=572)	2,032,538.74	197,557.05	295,633.25
C2M2 2012-2013 Average (N=286)	2,180,740.53	220,533.88	334,298.90
% Difference	7.29%	11.63%	13.08%

Data Source: DCED Annual Financial Data.

	Health and Human Services Expenditures	Public Works- Highways and Streets Expenditures	Culture and Recreation Expenditures
C1M1 2008-2011 Average (N=592)	300.42	274,444.65	7,139.55
C1M1 2012-2013 Average (N=296)	354.18	421,027.83	14,883.53
% Difference	17.90%	53.41%	108.47%
C1M2 2008-2011 Average (N=416)	209.83	330,331.44	75,348.93
C1M2 2012-2013 Average (N=208)	208.61	344,181.70	68,742.91
% Difference	-0.58%	4.19%	-8.77%
C2M1 2008-2011 Average (N=314)	1,164.32	539,549.41	31,842.92
C2M1 2012-2013 Average (N=157)	1,371.50	579,944.68	29,009.48
% Difference	17.79%	7.49%	-8.90%
C2M2 2008-2011 Average (N=572)	2,079.85	403,865.35	99,517.86
C2M2 2012-2013 Average (N=286)	2,066.55	435,541.91	92,525.93
% Difference	-0.64%	7.84%	-7.03%

Data Source: DCED Annual Financial Data.

Unlike the general overall downward trend in total county expenditures, the trend for these four municipal typologies demonstrates a clear upward trajectory, especially in the C1M1 and C1M2

municipalities, with percent changes of 45.37 percent and 22.65 percent, respectively. The overall largest expenditure categories as a share of total expenditures for municipalities were public works, which represented the largest municipal expenditure category, followed by government administration and police expenditures. In each of these categories, there are clear trends of increased expenditures, especially in the C1M1 municipalities. These annual financial reporting figures were consistent with the PUC and survey data analyses.

The second municipal-level analysis used the same basic percentage change approach, but split the 2008-2011 time period in two, allowing for comparisons between 2008/09 and 2010/11, and 2010/11 and 2012/13. In addition to the four primary municipal types, the research generated two additional typologies by combining all of the other Marcellus municipalities (minus those from the four urban counties) into “other Marcellus,” and including all municipalities from the 15 rural non-Marcellus counties into the type “non-Marcellus.” Table 23 presents the mean percentage increases for these three time periods for the categories of General Government, Police, and Public Works/Highways and Streets.

Table 23: Mean Expenditure Percentage Changes by Municipal Type

Years	C1M1	C1M2	C2M1	C2M2	Other Marcellus	Non-Marcellus
General Government Expenditures						
2008/09 - 2010/11	4.43	-9.06	9.69	0.09	15.07	-3.70
2010/11 - 2012/13	20.94	15.17	-6.97	11.08	22.59	3.37
Police Expenditures						
2008/09 - 2010/11	9.41	-4.56	1.97	10.95	10.65	3.59
2010/11 - 2012/13	-30.45	7.19	-28.26	-17.22	-21.21	-34.14
Public Works-Highways and Streets Expenditures						
2008/09- 2010/11	6.41	5.66	-4.33	16.67	11.86	2.23
2010/11 - 2012/13	48.60	8.14	10.50	-0.40	14.46	-1.76

Data Source: DCED Annual Financial Data.

Under general government expenditures, a mixed pattern occurred in the first time period, but showed a modest increase in reported expenditures for Marcellus municipalities. This same time period demonstrated an aggregate and overall decrease in general government expenditures for the non-

Marcellus municipalities. The second time period demonstrated generally significant percentage increases, with only a modest increase for the non-Marcellus municipalities.

Under police expenditures, the reported expenditures for the first time period generally showed modest increases across all but one typology. The second time period presented a very different dynamic, with overall significant percentage decreases in expenditures. This same pattern holds true for the non-Marcellus municipalities.

Public works/highways and streets indicated a very different, yet consistent, pattern. For Marcellus municipalities, during the first time period, all but one municipal type saw modest to significant increases in expenditures, at the same time that the non-Marcellus municipalities demonstrated marginal expenditure increases. Marcellus municipalities in the second time period, except for one municipal type, demonstrated modest to significant increases in expenditures at a time when non-Marcellus municipalities were experiencing a small decrease in this expenditure category.

The third municipal analysis examined these three expenditure categories as a mean share of total expenditures using the time periods 2008/11 compared to 2012/13. Table 24 presents the mean percentage “share” increases for the two time periods.

Table 24: Mean Shares 2008-11 & 2012-13

Categories	Years	C1M1	C1M2	C2M1	C2M2	RM	RNM
General Administrative	2008-2011	0.146	0.176	0.161	0.180	0.165	0.170
	2012-2013	0.135	0.172	0.150	0.151	0.153	0.170
Police Expenditures	2008-2011	0.089	0.124	0.099	0.089	0.111	0.109
	2012-2013	0.076	0.115	0.105	0.077	0.112	0.119
Public Works, Highways & Streets	2008-2011	0.529	0.415	0.486	0.498	0.499	0.452
	2012-2013	0.565	0.438	0.512	0.518	0.513	0.449

Data Source: DCED Annual Financial Data.

Though generally there were percentage increases in the category of general government expenditures, as a share of total municipal expenditures, there was a slight decrease in the Marcellus municipalities. While there were fairly significant decreases in police expenditures in the 2010/11 to 2012/13 time period, these occurred after a time period of modest increases. The share analysis suggests that expenditures in this category as an overall percentage share have decreased only slightly.

In the public works/highways and streets category, the analysis showed a consistent trajectory in terms of expenditures. There were consistent percentage increases within the category over time and noticeable increases in the budget share percentages of these expenditures. Figures 9, 10, and 11 present the annual percentage trends for these three categories from 2007 to 2013.

Figure 9: Annual Share General Administrative

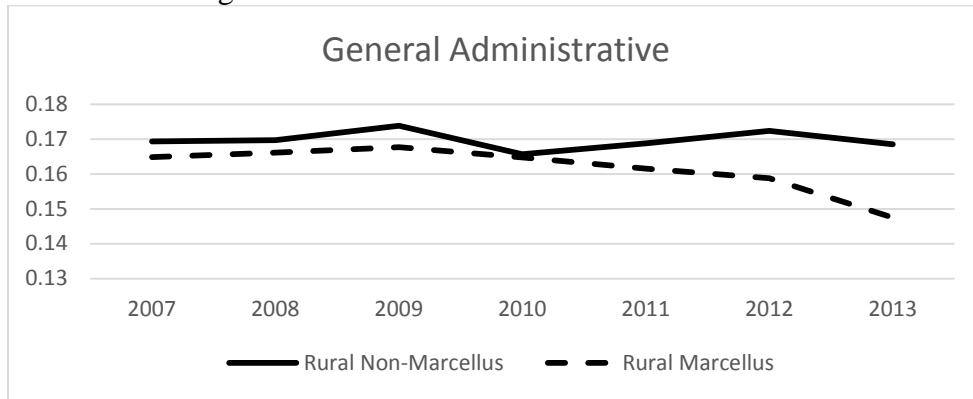


Figure 10: Annual Share Police Expenditure

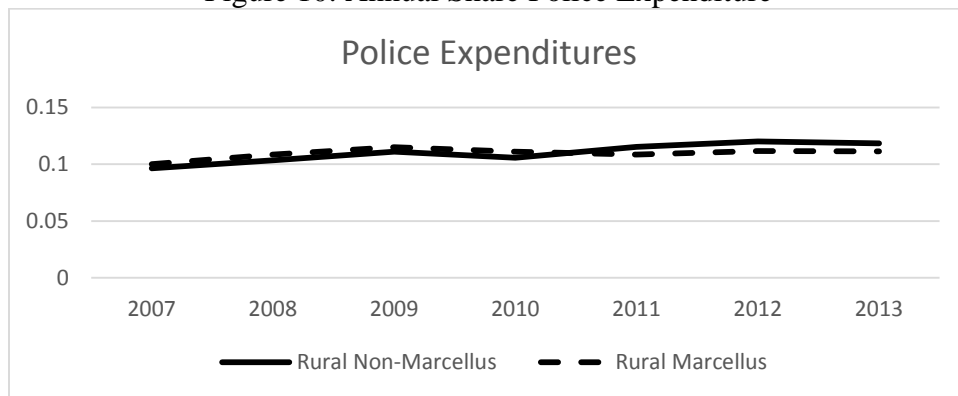
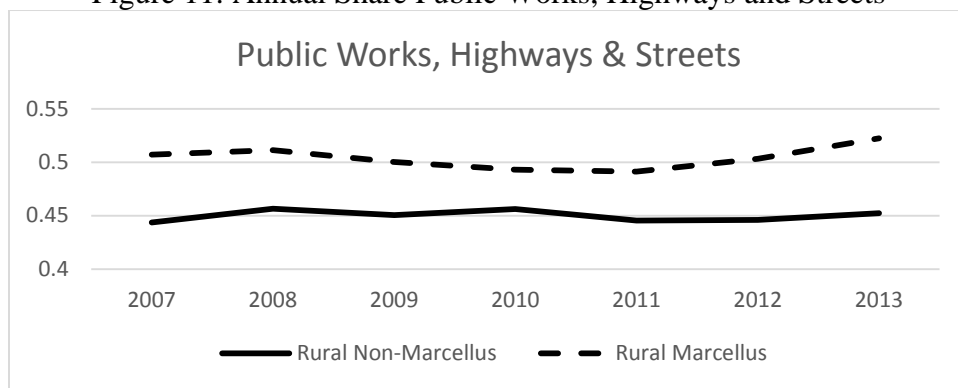


Figure 11: Annual Share Public Works, Highways and Streets



Difference-in-Difference Analysis

The researchers attempted to estimate how Act 13 disbursements and funding have impacted county and municipal budgets and spending longitudinally within counties and municipalities receiving Act 13 resources, and among municipalities and counties that have received resources and those that have not. The previous sections of this study provided details on contemporary patterns of expenditures to establish and identify changes, relative to prior spending patterns, within and across counties and municipalities. However, the question as to whether Act 13 funds have made an impact on local budgets of the Marcellus counties and municipalities has not yet been investigated. Therefore, the researchers examined the DCED data to find out if local budgets have been impacted after the disbursement of Act 13 monies.

To do so, the researchers used the difference-in-difference procedure, which helps answer the counterfactual question: what would have happened to local budgets if Act 13 funds had not been disbursed? If the counterfactual question can be answered, it can be compared to the factual situation where Act 13 funds have been distributed. The true impact of Act 13 funds would then be the difference between the factual values and the answer to the counterfactual question.

The difference-in-difference strategy is often employed in policy analysis with natural experiments. A natural experiment arises when some participants are exposed to a policy intervention, while others are not. The group that is exposed to the intervention is called the treatment group, and the group that is not exposed is the control group. The intervention is expected to have some outcomes. By exposing the intervention to the treatment group only, the researchers can learn the true impact of the intervention by examining the differences in the outcomes from both groups. Significant differences in outcomes between the treatment and control group indicate that the intervention had the necessary impact.

To apply the difference-in-difference method, the researchers had to ensure that some version of a natural experiment could be undertaken and had to have a clear idea about the intervention that has to be put in place. They had to identify the treatment and control groups and the intervention timeline for beginning and ending points. The timelines helped identify the characteristics of both the groups, before the intervention, and also after the intervention. Consequently, at the end of the intervention, four pieces of information emerged:

1. The features of the control group before the intervention;
2. The features of the treatment group before the intervention;
3. The features of the control group after the treatment; and
4. The features of the treatment group after the treatment.

The difference-in-difference method captures the significant differences in outcomes across the treatment and control groups, which occur between pre-treatment and post-treatment periods.

The difference-in-difference method is an appropriate modeling procedure for this study. The intervention in this case is the introduction of Act 13 funds in 2007. The funds were disbursed only to the spud counties, so these specific counties were considered as the treatment group. The control group included all of the other counties that did not receive any such financial benefit. The 2007 – 2011 time period was “pre”, or the period “before impact fees were disbursed.” The budget allocations for 2012 and 2013 were the “post” part of the analysis. Consequently, the introduction of Act 13 funds were thought of as a natural experiment, and the difference-in-difference method was suitable to study if the financial disbursements had any differential impact across the treatment and control groups.

The researchers again used the DCED budgetary data. The DCED data used in the previous section was used to determine whether there was a statistically significant difference in allocation patterns across municipal budgets. To examine if there were statistically significant changes in expenditure patterns, the study used the information in the DCED budget data for two time periods (“pre” and “post”) for the purpose of statistical estimation.

Next, the DCED data were also useful to identify the two groups: the control group and the treatment group. The control group was the set of counties that did not receive any Act 13 funds, or the non-Marcellus counties and municipalities in this study. The treatment group was the Marcellus counties and municipalities. Further, the treatment group and the control group were indistinguishable in the pre-treatment period. The groups were treated differently only during the treatment period, and hence the difference in this intervention can be observed in the “post” treatment period. If the treatment has any effects, then this difference would be evident in the “post treatment” period for the treatment group.

The econometric methodology that applies the difference-in-difference (DD) can be applied to the DCED data for the two groups, using information from both time periods.¹³ The researchers implemented the DD method by estimating the specific regression equation:

$$s_{it} = \alpha + a_1 Year + b_1 M_i + b_2 T + \delta M_i * T + \varepsilon_{it}$$

In the above equation, the level of the outcome variable, s_{it} , is the budgetary share for an expenditure category in a county i at time t . The variable $Year$ on the right-hand-side is a time trend, which serves as an independent variable. M_i is a dummy variable taking the value of 1 if the county is in the treatment group (has received Act 13 funds; or a Marcellus county) and 0 if it is in the control group, and T is a dummy variable taking the value of 1 in the post-disbursement period (2012, 2013) and 0 otherwise.¹⁴

The other terms in the equation are the coefficients (α, a_1, b_1, b_2 & δ), of the regression model. The above regression is useful in deriving the “difference-in-difference” effects, namely, whether Act 13 funds made a difference to budget allocations to the treatment group after 2012. The regression coefficients help in deriving the four effects that were listed before for the control and the treatment groups:

- “pre” effect for the control group (Non-Marcellus counties): $\alpha + a_1 Year$
- “post” effect for the control group (Non-Marcellus counties): $\alpha + a_1 Year + b_2$
 - Difference: b_2
- “pre” effect for the treatment group (Marcellus counties): $\alpha + a_1 Year + b_1$
- “post” effect for the control group (Marcellus counties): $\alpha + a_1 Year + b_1 + b_2 + \delta$
 - Difference: $b_2 + \delta$
 - Difference-in-Difference effect: δ

The important coefficient that provides the DD effect is δ , or the coefficient of the interaction between

¹³ The DD method is a quasi-experimental technique that measures the causal effect of some non-random intervention (Angrist and Krueger 1999; Stock and Watson 2011 p.493; Wooldridge 2002).

¹⁴ ε_{it} is the error term assumed to be i.i.d. normal.

M_i and T . Note that this interaction term is a dummy variable that takes the value of 1 only for the treatment group in the post-promotion period.

Table 25 includes the results of the estimation for overall county levels. The parameter estimates are provided for each share regression in different categories, along with the number of observations in each case in the last column (n).

Table 25: Parameter Estimates of the DD Model (1) for County Data

S_{it}	α	a_1	b_1	b_2	δ	n
General Government - Administrative	0.165	0.003	0.008	-0.006	0.012	439
General Government - Judicial	0.148 ^a	0.007 ^a	-0.021 ^a	-0.002	0.009	419
Public Safety	0.184	-0.001	0.036 ^a	-0.006	0.019	425
Highways and Streets	0.020	0.000	0.016 ^a	-0.006	0.009	324
Health and Welfare	0.502	-0.005	-0.070 ^a	0.016	-0.049	382
Sanitation	0.037	0.002	-0.018 ^a	-0.013	0.007	287
Community/Urban Redev & Housing	0.023	0.002	0.014 ^a	-0.008	-0.001	171
Economic Dev & Assistance	0.011	0.001	0.023 ^a	0.009	-0.015	167
Economic Opportunity	0.006	0.001	0.074	-0.003	-0.014	18

Note: the superscript a represents parameter estimates that are statistically significant at 99%. The last column presents the number of observations in each share equation.

Table 25 indicates there were significant effects if the county belongs to the treatment group. The coefficient that captures the difference-in-difference effect is δ for each share equation. Since the estimate of δ is not significant in any regression equation, the study cannot provide any conclusions, regarding the DD effects.

The coefficient b_1 captures the difference between Marcellus and Non-Marcellus groups in the “pre” treatment period. A positive sign indicates that in the “pre” period, the share of the treatment group is higher on average than the share of the category in the non-treatment group. The higher level of shares for the treatment group is indicated by positive and significant parameter estimates of b_1 for Public Safety, Highways and Streets, Community/Urban Redevelopment and in Economic Development. However, the

treatment group also has smaller effects on shares for Judicial, Health and Welfare and Sanitation categories.

The above model was also applied just to the counties that are located in the rural areas (See Table 26).

Table 26: Parameter Estimates of the DD model for Counties: Rural Data (2007–2013)

S_{it}	α	a_1	b_1	b_2	δ	n
Gen Govt – Admin	0.22^a	0.00	-0.04^a	-0.01	0.02	322
Gen Govt – Judicial	0.18^a	0.01^a	-0.05^a	-0.01	0.02	310
Public Safety	0.23^a	-0.004	0.003	-0.002	0.03	316
Highways & Streets	0.03^a	0.00	0.01	-0.01	0.01	243
Health & Welfare	0.40^a	-0.01	0.03	0.03	-0.06	275
Sanitation	0.04^a	0.00	-0.02^a	-0.01^a	0.01	257
Co/Urban Redev & House	0.03^a	0.00	0.00	-0.01	0.00	124
Econ Dev & Assistance	0.00	0.00	0.03^a	0.01	-0.02	120
Economic Opportunity	0.02	-0.01	0.11	0.05	-0.02	11

Note: the superscript *a* represents parameter estimates that are statistically significant at 99%. The last column presents the number of observations in each share equation.

As mentioned, the DD effects are captured by the coefficient δ , and the results indicated that this coefficient was not statistically significant for any of the share equations. However, the coefficient b_1 is negative and significant for three categories: Administrative Expenditures, Judicial and Sanitation Expenditures. This indicates that during the overall time period, the shares of these categories are, on average, lower for Marcellus counties. Likewise, coefficient b_2 is positive for Economic Development and Assistance, which indicates that the share of this category is higher on average for the treatment group. However, whether there were changes after the treatment in the Marcellus group relative to the non-Marcellus group was not conclusive, because the coefficient that captures this effect, δ , was not statistically significant.

The estimates indicated that the shares of these categories differ between these counties. However, whether there were any significant effects after the treatment, and whether there were any differences between the two groups could not be statistically validated with the results.

The same sets of regressions and results were replicated for the DCED data on municipalities. Model (1) is estimated for data on municipalities, and in this case, M_i is a dummy variable taking the value of 1 if an observed municipality is in the treatment group, and 0 if it is in the control group, and T is a dummy variable that takes the value of 1 in the post-disbursement period and 0 otherwise. Once again, the DD coefficient is δ , which is of interest, since it captures the DD effects in the data. Table 27 presents the results for the municipality share regression equations below.

Table 27: Parameter Estimates of the DD model (1) for Municipality Data

S_{it}	α	a_1	b_1	b_2	δ	n
General Government Expenditures	0.160^a	-0.0013	0.0077^a	-0.0006	-0.0004	17139
Police Expenditures	0.168^a	0.0021^a	-0.0317^a	0.0029	-0.0023	9401
Public Works-Highways & Streets	0.267^a	0.0002	0.1140^a	-0.0051	0.0013	17129
Sewer Expenditures	0.122^a	0.0000	-0.0021	0.0045	-0.0014	7328
Water Expenditures	0.084^a	-0.0009	0.0309^a	0.0012	0.0006	2983
Electric System expenditures	0.217^a	0.0139	-0.0684^a	-0.0039	-0.0436	441
Debt Service Expenditures	0.077^a	0.0012	-0.0011	0.0056	-0.0068^a	10366
Other Expenditures	0.090^a	0.0011	0.0127^a	0.0022	-0.0023	16495
Other Financing Uses Expenditures	0.083^a	-0.0002	0.0037	-0.0036	0.0042	11393

Note: The superscript a represents parameter estimates that are statistically significant at 99%. The last column presents the number of observations in each share equation.

DD effects were statistically significant only in the case of Debt Service Expenditures. In particular, the δ parameter estimate was negative and significant, which implies that Marcellus counties' share of Debt-Service expenditures decreased. From the DCED data, the research indicated that while Debt-Service outlays had increased dramatically for C1M1 and C1M2 municipalities, all other municipalities had a decline in this category. Consequently, the δ parameter captured the overall tendency in the post-spud-disbursement time period. As in the figures displayed in the previous section, Highways and Streets were positive and significant for all municipalities in the treatment group. These results suggest that there was partial statistical evidence indicating budgetary effects in Marcellus regions, but no statistical evidence exists for DD effects.

The regression models and the share equations for municipalities were also estimated for a sub-sample of observations that cover rural areas. Table 28 presents the results from this estimation.

Table 28: Parameter Estimates of the DD model (1) for Municipalities: Rural Data

S_{it}	α	a_1	b_1	b_2	δ	n
General Government Expenditures	0.173^a	-0.002	-0.004	0.005	-0.010	6797
Police Expenditures	0.096^a	0.003	0.005	0.002	-0.012	1588
Public Works-Highways & Streets	0.448^a	0.001	0.051^a	-0.008	0.007	6790
Sewer Expenditures	0.067^a	-0.003	0.010	0.007	0.006	2267
Water Expenditures	0.024^a	-0.002	0.045^a	0.013	-0.015	712
Electric System expenditures	0.003	0.003	0.044	-0.01	-0.009	90
Debt Service Expenditures	0.061^a	0.002	0.004	-0.003	-0.001	3155
Other Expenditures	0.108^a	0.000	0.002	0.006	-0.004	6623
Other Financing Uses Expenditures	0.060^a	0.003^a	0.012^a	-0.013	0.008	3627

Note: the superscript *a* represents parameter estimates that are statistically significant at 99%. The last column presents the number of observations in each share equation.

Overall, there were no DD effects observed in this version of the estimation as well. In particular, the sign of b_1 estimate for Highways and Streets, indicated that a municipality in the treatment group located in a rural area had a significantly higher share for this category when compared with non-Marcellus municipalities.

An important aspect of the estimation in Tables 28 and 29 was that the data include all municipality types. To obtain a better comparison, the next table presents the estimates of the same model, with data for just the top Marcellus municipalities (C1M1, C1M2, C2M1, C2M2) and the non-Marcellus regions (See Table 29).

Table 29: Parameter Estimates of the DD model (1) for Major Marcellus Municipalities and Non-Marcellus Municipalities: Rural Data

S_{it}	α	a_1	b_1	b_2	δ	N
Gen Govt Expenditures	0.171^a	-0.00043	-0.01^a	0.00172	-0.016^a	3479
Police Expenditures	0.099^a	0.00217	-0.01	0.00618	-0.015	884
Highways & Streets	0.443^a	0.00352	0.049^a	-0.0163	0.0237^a	3479
Sewer Expenditures	0.074^a	-0.00494	-0.01	0.01557	0.0101	1066
Water Expenditures	0.028^a	-0.00348	0.041^a	0.0197	-0.019	393
Electrical Expenditures	0.013^a	-0.00163	0.009	0.01014	-0.017^a	44
Debt Service Expenditures	0.063^a	0.00144	0.004	-0.0004	0.0026	1648
Other Expenditures	0.107^a	0.00086	0.007^a	0.00429	-0.011^a	3403
Other Financing Uses	0.06^a	0.00339	0.013^a	-0.0137	0.0097	1944

Note: the superscript *a* represents parameter estimates that are statistically significant at 99%. The last column presents the number of observations in each share equation.

Unlike the previous results, Table 29 produced estimates that indicate statistically significant difference-in-difference effects for four share categories: General Government Expenditures, Highways and Streets, Electrical Expenditures and Other Expenditures. In three of the expenditure categories, the sign of the DD-coefficient δ was negative, indicating that in the “post-disbursement” period, the expenditure share for these categories fell in rural Marcellus municipalities, when compared to the control group. These results correspond to the graphs from the previous section in this study. Most importantly, the sign of δ was significant and positive for Highways and Streets, which implies that the share of expenditure for this category increased in the “post-disbursement” period for the major Marcellus municipalities when compared to the control group. This result is significant because it echoes the observations made in the previous sections from the DCED data, PUC usage reports and survey responses. Overall, when the data are compartmentalized to include just the major municipality types, the DD-effects from the regression produced results that were reasonable and statistically significant. Act 13 monies impact municipal budgets by increasing the share of expenditure on Highways and Streets in the major rural Marcellus municipalities when compared to the rural non-Marcellus municipalities, which was the control group in this section of the study.

About the Data

This research used three primary sets of data: the Annual Usage Reports and subsequent PUC reporting of that data; the data generated by both the county and municipal surveys; and, the DCED annual financial reports.

With respect to the PUC usage report data, the results generated in this research and any conclusions drawn relative to those results, were done with the understanding that the amount of monies reported in the categories of Amount Not Reported (ANR) and Capital Reserve (CR) may in fact have significant impact on the actual and ultimate allocations of those resources. With 15.15 percent of municipal allocations being designated as ANR and 35.12 percent as CR over a 3-year period, more than 50 percent of municipal monies are not accounted for in this framework. For counties, the combined total was 55

percent. Additionally, even as counties and municipalities submit the usage reports, there is still the possibility that their ultimate and actual allocation choices will differ, as there is no statutory requirement for a separate accounting for the actual allocations.

Regarding the survey data, while there were 562 municipal surveys and 16 county surveys received in time for analysis, generating good response rates, some individual question responses were not valid, mostly and primarily for reasons having to do with improper response form relative to the question. Still, the data from the survey represent a solid data set, with good response rates for the textual questions as well.

In terms of the county and municipal DCED data used for this report, several dynamics need to be reported. First, with respect to the percentage analyses, occasional gaps existed in the data, with some reporting years not available for some counties and municipalities. In constructing the datasets in advance of analysis, if there were one or two missing years within the analytic reporting period, the researchers used/inserted the data for the next, more contemporary year in place of the missing year. If a municipality was missing 3 years within a period, then all of the municipality's financial reporting was removed from the analysis for that particular period.¹⁵ Second, while there is one financial reporting structure for counties, and the financial reporting structures are the same for all counties, and one for all municipalities, the use of the financial reporting structures is not the same across all local governments; there is, in other words, interpretive and use flexibility in terms of just where counties and municipalities might post certain expenditures. The scope and extent of the variability is unknown, yet may, in some areas, have effects not discernable in this study.

¹⁵ Municipal percentage analysis using DCED financial data was conducted on only C1M1, C1M2, C2M1 and C2M2 municipalities, generating an overall potential N of 2,982 reporting years for the years 2008-2013. Total observations/reporting years equaled 2,841, with 141 municipal reporting years removed from the analysis.

Conclusions

Distribution of Act 13 Impact Fee Resources

With respect to the distribution of Act 13 Impact Fee resources, the results from this study indicate clearly that a very significant portion of the impact fee revenues are going to the six C1 counties, as well as 154 M1 municipalities within the C1 jurisdictions. This, of course, is a result of the design of Act 13. Overall, 73.90 percent of the county allocation portion of Act 13 went to the six C1 counties, and 14.36 percent went to the five C2 counties, for a combined total county disbursement of 88.26 percent. Of the total municipal distribution, 72.12 percent went to the 274 municipalities in the six C1 counties, with 85 percent of this total being distributed to the 154 M1 municipalities, or municipalities with spud wells, within their jurisdiction. Similar observations regarding the distribution pattern of these resources have also been generated by previous studies on Pennsylvania's Marcellus industry (Raimi, D. and R. Newell, 2014a and 2014b).

Trends in Impact Fee Allocations

In aggregate, the top three county allocation categories were Capital Reserve, Emergency Preparedness and Public Safety, and Public Infrastructure Construction, with the 37 counties allocating 51.43 percent to Capital Reserve, 18.06 percent to Emergency Preparedness and Public Safety, and 9.62 percent to Public Infrastructure Construction. Reported allocations, however, for 2013 and 2014 on Emergency Preparedness and Public Safety increased noticeably, as did expenditures on Public Infrastructure Construction.

The survey results indicated that, at least in terms of those 16 counties that responded, Emergency Preparedness and Public Safety, Public Infrastructure Construction, and Social Services were ranked as the top three priorities for allocation.

As noted earlier, there were several noticeable trends that emerged when examining county typologies in the allocation of impact fee resources across the designated and approved categories. Specifically, county allocations of impact fee resources are consistent with the general governmental functions of

county government in Pennsylvania. Also, Legacy funds are used for a variety of development projects, ranging from conservation to farmland preservation. Previous studies have not made any inquiries into the use of these funds.

Municipalities, in aggregate, allocated 36.64 percent to Public Infrastructure Construction, 35.12 percent to Capital Reserve, and 8.59 percent to Emergency Preparedness and Public Safety. Over the 3 years of allocations, however, Capital Reserve reported allocations decreased significantly, while Emergency Preparedness and Public Safety increased noticeably. Most significantly, however, was the increase in allocations in the area of Public Infrastructure Construction. Additionally, municipal survey results indicated that the top three priorities for impact fee monies were Public Infrastructure Construction, Emergency Preparedness and Public Safety, and Storm Water and Sewer Systems. Given that road and infrastructure maintenance is a central function of local governments in Pennsylvania, this study concludes that allocation trends are consistent with municipal functions.

Impacts and Trends in County and Municipal Financial Expenditures

Previous studies have identified little to no direct impact of Marcellus activity on county or municipal financial reporting. The Brasier et al. (2014) study examined DCED financial data from 2007 through 2010 and did not identify any effects of Marcellus development on local government budgets. The report did, however, through the use of focus groups with local officials, produce some anecdotal evidence about the impacts on roads from truck traffic, housing problems, and spending impact fee resources on new equipment and infrastructure. The Jacobson and Kelsey (2011) study examined DCED financial data from 2001 to 2009 for two counties, Susquehanna and Washington, and found no clear indications of impact in the data. Kelsey and Ward (2011), relying not on DCED financial data but rather on survey responses from 494 municipalities, also found that little impact on local finances was occurring, with 71 percent of the respondents indicating no effect. These studies, however, were based on data and dynamics representative of the early stages of Marcellus development.

In contrast, this study determined that there were observed identifiable patterns of impact on county and municipal expenditures, and that this impact can be observed in county and municipal financial reports.

As this research suggests, county expenditures in the categories of general administrative, judicial, public safety, and highways and streets all demonstrate observable impact, especially for the C1, C2, and C3 typologies, and additionally when rural Marcellus counties are compared with rural non-Marcellus counties. The same is true for municipalities in the categories of total expenditures, general government, police, and especially public works/highways and streets, and again, most clearly for the four select Marcellus municipal typologies, and in comparison to rural non-Marcellus municipalities.

Difference in Difference Analysis

The research estimates indicated statistically significant difference-in-difference effects for four categories: General Government Expenditures, Highways and Streets, Electrical Expenditures and Other Expenditures. Previous research (Jacobson and Kelsey, 2011) did not establish any clear relationships with the level of Marcellus Shale activity in jurisdictions, mainly due to the lack of relevant data in the research time-frame, which was 2001-2009. Further, Jacobson and Kelsey (2011) considered only the municipal spending and revenues in Susquehanna and Washington counties. In contrast to other research, this study used data in the pre- and post-disbursement time period for all counties and municipalities.

When the data for major municipality types (C1M1, C1M2, C2M1, C2M2) from the rural areas were compared with non-Marcellus rural municipalities, the study found significant post-treatment effects. For instance, in terms of post-disbursements, there was a statistically significant increase in the share of expenditure in Highways and Streets in the major rural Marcellus municipalities when compared to the non-Marcellus municipalities. Likewise, there was a statistically significant decrease in the shares of General Government Expenditures and Other Financing Uses categories in the treatment group, post-disbursement. These results are consistent with the trends from the DCED data, the PUC usage reports, and the study's survey responses. Act 13 monies impact municipal budgets by increasing the share of

expenditures on Highways and Streets in the major rural Marcellus municipalities when compared to the rural non-Marcellus municipalities, which is the control group in this section of the study.

Almost all of the previous researchers observed the lack of data, particularly in the post-disbursement period, and concluded that their observations were relatively early in the development of Marcellus Shale. This research concurred with these observations, and noted that it is important to continue monitoring development of Shale activity and to identify if or when impacts on local governments occur.

Policy Considerations

Given the current and most likely future importance of Marcellus Shale development to Pennsylvania, and the direct economic consequences Marcellus and other natural gas development will have on different constituencies within the region, this research offers the following policy considerations:

- 1.) Develop a financial accounting system that gathers more specific and detailed information on how counties and municipalities are using Act 13 resources.

To obtain a better understanding of how Act 13 funds are being used, the state should consider developing a more accurate and discreet financial accounting of Act 13 funds within DCED's reporting structure, or through a separate reporting process. Under the current structure, there is no specific formulation that allows policymakers, analysts or researchers to effectively discern the use of Act 13 resources. Future policymakers, analysts or researchers would benefit greatly from clarified reporting and financial records. County and municipal officials would also benefit from such reporting, as they will be in a much better position to address needs for continued future funding. Additionally, future analysis would benefit from clarified reporting processes involving the "Capital Reserve" category found in the current structure. Given the current structure, there is no mechanism available to provide reconciliation between the annual usage reports, and the annual financial reports.

Also, this research indicated clearly that the bulk of Act 13 resources are being distributed to a relatively concentrated set of counties and municipalities. If future policy development were to consider a formula under which more developed reporting processes would occur, it may also consider exempting

counties and municipalities that receive relatively “insignificant” (however that might be defined) resources from the more rigorous reporting requirements.

2.) Support additional research on how the budgets of counties and municipalities on the periphery of Marcellus development are being impacted.

Significant research has been produced in recent years regarding the effect of Marcellus development in the commonwealth. However, more research and information are critical, particularly in helping policymakers, analysts and researchers understand the widespread financial, social and environmental impacts of Marcellus development. In terms of understanding more fully the impacts of Act 13 funds on local budgets, future research should be directed towards those counties – C3, C4 and C5 or future others – currently on the periphery of Marcellus activity to have an information foundation moving forward, in anticipation of future development.

3.) Gather more detailed information on how county and municipal governments are using Legacy funds.

As reporting currently stands, there is no mechanism to understand the importance of Legacy funds to the commonwealth. Future policymaking and research will benefit if a more developed reporting system is implemented. Policy development will be less than optimal and research findings partial in the absence of this information.

4.) Support additional research on the impact of Marcellus development and Act 13 funding in the areas of health and human services.

County governments are charged with delivering health and social services to residents and these governments are using Act 13 resources to support those services. Therefore, the most appropriate state and/or county agencies should consider examining the dynamics of Marcellus development and the use of Act 13 resources in this area.

5.) Recognize the importance of Act 13 or other revenues to county and municipal governments because Marcellus activity is having an impact in local communities.

The researchers recommend that future policy considerations and development regarding commonwealth revenues generated relative to Marcellus development be conducted in a way that recognizes the importance of current impact fee revenues to the rural counties and municipalities within which these activities are taking place. While taking into account the dynamics raised in the two previous policy considerations – that policy may benefit from a clearer understanding of the nature and scope of impact – this study, along with earlier research, points to the significant level of impact associated with Marcellus activity, and thus the importance of revenues available to respond to that impact.

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Appendix A

Survey of Counties: Utilization of Act 13 Impact Fee Revenues
Sponsored by the Center for Rural Pennsylvania
Dr. Shailendra Gajanan and Dr. Stephen Robar, Principal Investigators

1.) County: _____

2.) Overall Allocations:

Using the structure of the Unconventional Gas Well Usage Report below, please mark to the right – using “1” “2” and “3” – the top three uses (#1 being your top use) to which your county is utilizing Act 13 Impact Fee (60% spud) revenues. If fewer uses then simply indicate 1, 2, etc...

USE OF UNCONVENTIONAL GAS WELL FUNDS

Construction, reconstruction, maintenance and repair of roadways, bridges and public infrastructure.	
Water, storm water and sewer systems, including construction, reconstruction, maintenance and repair	
Emergency preparedness and public safety, including law enforcement and fire services, hazardous material response, 911, equipment acquisition and other services	
Environmental programs, including trails, parks and recreation, open space, flood plain management, conservation districts and agricultural preservation	
Preservation and reclamation of surface and subsurface waters and water supplies	
Tax reductions, including homestead exclusions	
Projects to increase the availability of safe and affordable housing to residents	
Records management, geographic information systems and information technology	
The delivery of social services	
Judicial services	
Career and technical centers for training of workers in the oil and gas industry	
Local or regional planning initiatives under the act of July 31, 1968 (P.L. 805, No. 247), known as the Pennsylvania Municipalities Planning Code	
Capital Reserve/Investment	

3.) Please provide as best you can, some of the more significant examples of the types of uses, or projects, or equipment, etc. that your county is directing resources towards **WITHIN** those “**Top Three**” categories identified above. Please be as specific as possible.

4.) Using the DCED Annual Financial reporting categories below, please indicate using the scale to the right, with “0” being **no impact** and “5” being **high impact** the degree to which shale-related natural gas drilling or development has impacted public services and expenditures in your county in these areas.

USE OF UNCONVENTIONAL GAS WELL FUNDS

1. Judicial Service	0	1	2	3	4	5
2. Public Safety	0	1	2	3	4	5
3. Highways and Streets	0	1	2	3	4	5
4. Sanitation	0	1	2	3	4	5
5. Health and Welfare	0	1	2	3	4	5
6. Culture and Recreation	0	1	2	3	4	5
7. Conservation	0	1	2	3	4	5
8. Community Redevelopment and Housing	0	1	2	3	4	5
9. Economic Development and Assistance	0	1	2	3	4	5
10. Economic Opportunity	0	1	2	3	4	5
11. Capital Outlays	0	1	2	3	4	5
12. Other Expenditures If “other” is significant, please give some significant examples:	0	1	2	3	4	5

Capital Reserve Allocations:

According to Unconventional Gas Well Usage Reports, as reported on the Public Utility Commission’s (PUC) web site, many counties and municipalities during the first year of distribution chose to allocate the Impact Fee (60% spud) resources received to “capital reserve.” Given the current structure and operation of the Act 13 Usage Reports, little information exists as to the ultimate utilization of funds that were/are being placed in “capital reserve.”

However, when Act 13 was first implemented, many local governments were still on the whole deciding how to invest these funds for community projects and needs. In fact, this category may perhaps more accurately, in some cases, be labeled “**capital investment.**” Additionally, some counties and municipalities continue to allocate to capital reserve in order to accumulate resources for future projects, using perhaps the funds to leverage other funding efforts.

There are two questions addressing this issue:

5.) Referencing now **capital reserve/investment allocations**, please mark to the right – using “1” “2” and “3” – the top three uses (#1 being your top use) to which your county **has already utilized** funds that were designated as “capital reserve” funds. If fewer uses then simply indicate 1, 2, etc...

USE OF UNCONVENTIONAL GAS WELL FUNDS	
Construction, reconstruction, maintenance and repair of roadways, bridges and public infrastructure.	
Water, storm water and sewer systems, including construction, reconstruction, maintenance and repair	
Emergency preparedness and public safety, including law enforcement and fire services, hazardous material response, 911, equipment acquisition and other services	
Environmental programs, including trails, parks and recreation, open space, flood plain management, conservation districts and agricultural preservation	
Preservation and reclamation of surface and subsurface waters and water supplies	
Tax reductions, including homestead exclusions	
Projects to increase the availability of safe and affordable housing to residents	
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The delivery of social services	
Judicial services	
Career and technical centers for training of workers in the oil and gas industry	
Local or regional planning initiatives under the act of July 31, 1968 (P.L. 805, No. 247), known as the Pennsylvania Municipalities Planning Code	

6.) Referencing now **capital reserve/investment allocations**, please mark to the right – using “1” “2” and “3” the top three uses (#1 being your top use) to which your county **intends to utilize** capital reserve or investment funds. If fewer uses then simply indicate 1, 2, etc...

USE OF UNCONVENTIONAL GAS WELL FUNDS

Construction, reconstruction, maintenance and repair of roadways, bridges and public infrastructure.	
Water, storm water and sewer systems, including construction, reconstruction, maintenance and repair	
Emergency preparedness and public safety, including law enforcement and fire services, hazardous material response, 911, equipment acquisition and other services	
Environmental programs, including trails, parks and recreation, open space, flood plain management, conservation districts and agricultural preservation	
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Career and technical centers for training of workers in the oil and gas industry	
Local or regional planning initiatives under the act of July 31, 1968 (P.L. 805, No. 247), known as the Pennsylvania Municipalities Planning Code	

7.) Please indicate, should you wish to, the types of uses, or projects, or equipment, etc. that your county is planning on directing capital investment resources towards.

8.) Act 13 provides all counties with **Legacy Fund** monies that are to be dedicated to **open space and greenway projects**. Please indicate how your county is utilizing these resources to further these purposes.

9.) **Open Comment:** Please provide, if you wish to, general comments as to how shale-related natural gas drilling or development has affected your county. If “no impact,” please simply indicate “no impact.”

Thank You

Your timely completion and submission of this survey would be very valuable and appreciated.

Appendix B

Survey of Municipalities: Utilization of Act 13 Impact Fee Revenues
 Sponsored by the Center for Rural Pennsylvania
 Dr. Shailendra Gajanan and Dr. Stephen Robar, Principal Investigators

1.) Please indicate whether or not you are responding on behalf of a township, borough, or city:

Township: _____ Borough: _____ City: _____

2.) Name of Municipality: _____

3.) County: _____

4.) Overall Allocations:

Using the structure of the Unconventional Gas Well Usage Report below, please mark to the right – using “1” “2” and “3” – the top three uses (#1 being your top use) to which your municipality is utilizing Act 13 Impact Fee (60% spud) revenues. If fewer uses then simply indicate 1, 2, etc...

USE OF UNCONVENTIONAL GAS WELL FUNDS

Construction, reconstruction, maintenance and repair of roadways, bridges and public infrastructure.	
Water, storm water and sewer systems, including construction, reconstruction, maintenance and repair	
Emergency preparedness and public safety, including law enforcement and fire services, hazardous material response, 911, equipment acquisition and other services	
Environmental programs, including trails, parks and recreation, open space, flood plain management, conservation districts and agricultural preservation	
Preservation and reclamation of surface and subsurface waters and water supplies	
Tax reductions, including homestead exclusions	
Projects to increase the availability of safe and affordable housing to residents	
Records management, geographic information systems and information technology	
The delivery of social services	
Judicial services	
Career and technical centers for training of workers in the oil and gas industry	
Local or regional planning initiatives under the act of July 31, 1968 (P.L. 805, No. 247), known as the Pennsylvania Municipalities Planning Code	
Capital Reserve/Investment	

5.) Please provide as best you can, some of the more significant examples of the types of uses, or projects, or equipment, etc. that your municipality is directing resources towards **WITHIN** those “**Top Three**” categories identified above. Please be as specific as possible.

6.) Using the DCED Annual Financial reporting categories below, please indicate using the scale to the right, with “0” being **no impact** and “5” being **high impact** the degree to which shale-related natural gas drilling or development has impacted public services and expenditures in your municipality in these areas.

USE OF UNCONVENTIONAL GAS WELL FUNDS

General Government	0	1	2	3	4	5
Police	0	1	2	3	4	5
Fire	0	1	2	3	4	5
Code Enforcement	0	1	2	3	4	5
Other Public Safety	0	1	2	3	4	5
Health and Human Services	0	1	2	3	4	5
Public Works: Highways and Streets	0	1	2	3	4	5
Sewer	0	1	2	3	4	5
Water	0	1	2	3	4	5
Solid Waste	0	1	2	3	4	5
Other Public Works	0	1	2	3	4	5
Culture and Recreation	0	1	2	3	4	5
Community Development	0	1	2	3	4	5

Capital Reserve Allocations:

According to Unconventional Gas Well Usage Reports, as reported on the Public Utility Commission’s (PUC) web site, many counties and municipalities during the first year of distribution chose to allocate the Impact Fee (60% spud) resources received to “capital reserve.” Given the current structure and operation of the Act 13 Usage Reports, little information exists as to the ultimate utilization of funds that were/are being placed in “capital reserve.”

However, when Act 13 was first implemented, many local governments were still on the whole deciding how to invest these funds for community projects and needs. In fact, this category may perhaps more accurately, in some cases, be labeled “**capital investment.**” Additionally, some counties and municipalities continue to allocate to capital reserve in order to accumulate resources for future projects, using perhaps the funds to leverage other funding efforts.

There are two questions addressing this issue:

5.) Referencing now **capital reserve/investment allocations**, please mark to the right – using “1” “2” and “3” – the top three uses (#1 being your top use) to which your municipality **has already utilized** funds that were designated as “capital reserve” funds. If fewer uses then simply indicate 1, 2, etc...

USE OF UNCONVENTIONAL GAS WELL FUNDS	
Construction, reconstruction, maintenance and repair of roadways, bridges and public infrastructure.	
Water, storm water and sewer systems, including construction, reconstruction, maintenance and repair	
Emergency preparedness and public safety, including law enforcement and fire services, hazardous material response, 911, equipment acquisition and other services	
Environmental programs, including trails, parks and recreation, open space, flood plain management, conservation districts and agricultural preservation	
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The delivery of social services	
Judicial services	
Career and technical centers for training of workers in the oil and gas industry	
Local or regional planning initiatives under the act of July 31, 1968 (P.L. 805, No. 247), known as the Pennsylvania Municipalities Planning Code	

6.) Referencing now **capital reserve/investment allocations**, please mark to the right – using “1” “2” and “3” – the top three uses (#1 being your top use) to which your municipality **intends to utilize** capital reserve or investment funds. If only one or two, indicate so.

USE OF UNCONVENTIONAL GAS WELL FUNDS

Construction, reconstruction, maintenance and repair of roadways, bridges and public infrastructure.	
Water, storm water and sewer systems, including construction, reconstruction, maintenance and repair	
Emergency preparedness and public safety, including law enforcement and fire services, hazardous material response, 911, equipment acquisition and other services	
Environmental programs, including trails, parks and recreation, open space, flood plain management, conservation districts and agricultural preservation	
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7.) Please indicate, should you wish to, the types of uses, or projects, or equipment, etc. that your municipality is planning on directing capital investment resources towards.

8.) **Open Comment:** Please provide, if you wish to, general comments as to how shale-related natural gas drilling or development has affected your county. If “no impact,” please simply indicate “no impact.”

Thank You

Your timely completion and submission of this survey would be very valuable and appreciated.

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The Center for Rural Pennsylvania
625 Forster St., Room 902
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(717) 787-9555
www.rural.palegislature.us
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