

Winter is Coming:
Pennsylvania Department of Transportation
Budgeting for Winter Road Maintenance in Rural and Urban Counties

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Abstract

The purpose of this paper is to explore whether urban or rural counties are underfunded in terms of budgeted public goods. The paper utilizes data from the Pennsylvania Department of Transportation's Winter Service Guide from 2017 and 2018 to look at transportation funding. This paper argues that the resources budgeted to both urban and rural areas do not appear to be a political calculation, but rather a function of service delivery based on non-political factors. The paper also calls into question the justification of resentment from rural and urban residents to their respective counterparts.

Introduction

Growing up in a rural Pennsylvania farming town has given me a unique perspective on almost every aspect of life. With only 300 people in the town—all of whom have similar backgrounds, economic status, and political ideas—there is not much variety to the opinions on major issues. The few who differ from the majority tend to hold their opinions closely, and those growing up in such an area tend to get a one-sided view of the issues at hand.

While there are some differences in opinion on important political subjects, the universal truth to members of rural communities revolves around the use of taxpayer dollars. For most members of rural communities, it is assumed that tax money paid to the state capitol each year is not given back fairly and is instead used to benefit more populated areas of the state. After 18 years in the echo chamber of my small town, I quickly discovered that rural communities were not the only groups that felt this way. My new friends who had come from major cities all throughout the country also had the same complaints, but this time, about rural areas needlessly taking money from the areas that have a population to be taken care of.

A major component to this double-sided argument is resentment of “the other group.” Rural dwellers cannot understand why their roads are dilapidated, they have extremely limited access to public transportation, and simply do not see the benefits of paying taxes. Instead, the members feel they have been neglected by the government entirely and left to survive without the help of others. In urban areas, the situation appears very similarly. The roads are still in poor condition, and the services that are provided are far from flawless. For people living in urban areas, the money sent to rural areas would be better spent in improving the facilities they use on a daily basis, and not sent to the small farm towns of the state to help such a small portion of the population.

Resentment for “the other”, to use Cramer Walsh’s term for opposing groups, is deep seeded in the idea that the opposing group brings the issues they have onto themselves, and money could be allocated more fairly if only they would behave differently—ideally, more like “us”. While this attitude is no helpful to the issue at hand, blaming others for under-serviced and poorly provided goods is a quick fix that allows groups to move on and accept that there is nothing they can do on their own to fix the issues.

Wondering if the resentment felt by either group was justified, I decided to use data regarding state level budgeting given to rural and urban counties. Focusing on transportation maintenance specifically, I considered the population density of each county, and the money budgeted to each area to find out which, if either, group has been justified in their feelings toward the other.

While I admittedly came to this project with a bias, hoping those in my hometown had been right all along, the literature supported both my own ideas and the reality for those in urban areas (Duncan 2001; Fuchs, Shapiro, and Minnite 2001; Wilson 1987). Instead of a clear-cut

answer to my questions about state-level allocation, I found a far more complicated picture of how the government distributes resources. Instead of a corrupted and blatant bias in either direction, I found a largely apolitical system in place for allocation and a surprising lack of bias. Reviewing the literature on the topic will provide a better understanding of the perceived biases assumed by both rural and urban groups throughout the United States before data on the topic is presented and explained.

Review of the Literature

The United States is made up of an interesting mixture of bustling urban cities and vast expanses of rural farmland. With these differences in population density come differences in culture, core values, and political affiliations. While these differences influence many aspects of the lives of individuals in either rural or urban areas, one of the most notable differences in rural and urban areas is the way individuals feel toward the government. In many cases, those in rural areas feel as though they are neglected when comparing themselves to their urban counterparts. Due to the social expectations of rural areas throughout the United States, rural areas appear to be underfunded and ignored by assistance programs and the provision of public goods, influencing the way individuals view and respond to the government.

Rural towns throughout the United States are suffering financial ruin and the loss of economic opportunities. As small farming towns become overshadowed by the industrialization and mass production of once-local produce by corporate companies, the towns that were once dependent on the agriculture markets for economic prosperity are suffering and fizzling out (Carr and Kefalas). Rural poverty is equally as prevalent as urban poverty, however, less attention is paid to small towns as they suffer (Weber et. al). The trend of small towns dying out

is not new, and historically not a permanent result (Conn 2014). For decades, small towns have seen a steady decline in both population and economic development; however historical context suggests that rural areas boom for short periods of time, followed by a steady decline for several years until a second economic boom takes place (Conn 2014; Meckler 2014). This was seen in the 1970s, as groups reverted to the country and small towns were rejuvenated, followed by intense decline and abandonment of the same towns through the 1980s. In the 1990s and early 2000s, there was another “rural boom” with large numbers of people moving away from the city and into the country (Conn 2014). Today, the small towns seem to be suffering through the abandonment phase of the cycle. As people migrate from small towns to metro areas, it reflects a personal acceptance that the way of life in small towns is unlikely to change and the lack of technological, economic, or social development is a permanent characteristic of the area (Barkley 1974, Wuthnow 2013).

As rural areas continue to suffer economic losses, there is little that can be done to help the small towns stay on the map. Some of the best hope rural areas possess is found in the young people that leave the towns to become educated (Carr and Kefalas). However, after leaving the rural areas they grew up in for better opportunities, many youths realize the lack of opportunity present at home, and choose to leave the areas for better jobs, better opportunity, and better development (Carr and Kefalas). While in some cases, this “helps small towns stay small,” it also endangers the already fragile economic state, as these areas are made up largely of the elderly and other non-working groups (Carr and Kefalas). With the loss of educated working-age citizens, the towns that are already suffering continue to lose the only chance they have to recover themselves from complete economic depletion. More often than not, rural citizens leave their small towns for the working years of their lives, and return to the slow pace of the

farmland in their later years for retirement (Pied 2011). While this movement allows for a maintained population, the model still does not provide development of any type to the areas in question, allowing rural poverty to continue to sweep through the nation (Pied 2011).

Many people, rural or urban dwelling, do not realize the importance or significance that rural poverty has on the lives of American citizens. There are multiple reasons the general public is not as aware of rural poverty, but one of the most significant is the lack of media attention to rural areas (Meckler 2014). Rural poverty does not have the same shocking imagery that is seen in stories and coverage of urban poverty. Factories clad with broken and boarded windows are received differently than a picturesque abandoned barn, though both images portray the same message—a loss of economic contribution and a failure of a business (Weber et. al 2005). The political aspects of small towns are also largely ignored at the national level (Knoke and Henry 1977). While the mayors of major cities like New York and Chicago become household names, the leaders and interests of small towns do not concern the larger public (Knoke and Henry 1977). This leaves rural areas and their specific issues out of the national political conversation, and fosters the idea that rural areas are under-represented in elections and polling, as the rest of the country is not concerned with their thoughts, opinions, or problems as they are being faced (Knoke and Henry 1977).

There is more to rural areas than the depletion of economic resources, however. Rural areas and small towns are known for having a sense of community that is not found in more urban settings. Knowing the new family in town is a high priority for those in rural areas, while those in more urban settings may not even be aware there has been a change in the residents next door at all. The social structure in rural places strays from that of urban areas because the mentality of the groups that live there is different (Bell 1992). Overall, there tends to be a

difference in the values that are held by those that live in small towns compared to those that live in dense urban areas. Old-fashioned, simplistic values are held, while new developments and major changes are not well-received (Bell 1992). Even those that move into rural areas are not received without proper vetting, and an understanding of their previous rural experiences (Bell 1992). Those with strong or consistent rural experiences will be better received than those moving from a large city, as rural experiences are seen to be universal and wholly different than the experiences of those that live in urban spaces (Bell 1992).

This concept of who is accepted and who is considered “the other” can fuel contention between individuals, as well as continue to influence the interactions between groups. The groups see their differences as greater than their similarities, and assume their core values to be different (Cramer 2012; Bell 1992). This concept plays a major role between rural and urban groups, as rural citizens tend to blame their disadvantages on the “urban elites” that have more say in government and a larger societal pull than rural groups (Cramer 2012; Carr and Kefalas 2011). In rural areas, personal connections and relationships are extremely important, as banding together against Washington and large government is a priority of the residents of these areas (Wuthnow 2013). Put simply, knowing who in the town is on the same side of the fight is more important for the people that live in rural areas than developing the town or working to solve the economic crises taking place (Wuthnow 2013).

The tight-knit communities and the simplistic way of life are not the only differences rural areas have compared to urban settings. Rural areas tend to vote Republican while urban areas fall to the Democratic side of the political spectrum (Gimple and Karnes 2006; Meckler 2014). This is not simply a comparison among rural and urban states, but even areas within states that fall into rural and urban categorizations (Gimple and Karnes 2006). Each group has different

approaches to the political aspects of the United States, just as they exhibit differences in other aspects of their lives. This is both due to an actual difference in the beliefs of rural and urban groups, as well as the lack of media coverage that rural concerns and opinions get compared to urban political opinions (Gimple and Karnes 2006). In national-level polls, rural areas are not accurately or adequately represented, and those living in rural areas are well aware of this (Gimple and Karnes 2006). While the stereotype is that rural individuals are not educated enough to vote effectively, the reality is that the populations in rural areas are left under the impression that neither party is planning to benefit them directly, and instead vote for the larger picture ideas they believe will benefit rural areas as a whole, even if they do not benefit the voter's individual situation (Gimple and Karnes 2006; Pied 2011; Wuthnow 2018). Largely, the reality is that those who live in the small towns tend to be the only groups that care about their survival at the national level.

As politicians campaign, they attempt to appeal to rural areas, but overlook the idea that development in rural areas is as important and necessary as the development of urban sites (Carr and Kefalas). By not mentioning the development of rural areas, but discussing the importance of urban development, rural voters feel neglected by the government and further instill the idea that neither party will benefit the rural population if elected to office (Carr and Kefalas 2011). The few political candidates that do speak to rural areas often have a hard time effectively relating to the populations to which they are attempting to appeal (Weber et. Al 2005). When speaking of developing the country in new ways and solving major poverty crises, rural groups have a hard time relating to the suggested solutions, as rural and urban poverty are different forms of poverty and cannot be approached the same way (Weber et. al 2005).

While both poverty-stricken inner-city neighborhoods and crumbling small towns suffer from the creation of food deserts and an overall lack of opportunity for advancement, the ways the issues can be solved by politicians and individuals are different across spaces (Weber et. al 2005). Rural areas are at a dual disadvantage, with not only a lack of opportunity, but a higher number of barriers preventing development from taking place (Weber et. al 2005). Additionally, rural groups tend to have non-liquid assets, meaning the assets they do possess cannot be sold quickly for cash (Weber et. al 2005). Urban dwellers, who typically have more liquid assets, are better able to get ahead or find ways to ensure they are able to afford bills and other expenses, while those in rural areas would need to sell necessary property or equipment, as their financial worth is tied to those assets (Weber et. al 2005). By approaching both types of poverty with similar solutions, rural areas maintain distrust for big government, and retain the hopelessness that no effective changes will be made for their benefit by those in power.

This pattern of social group behavior and mistrust of government has changed in recent years. Rural groups have continued to trust in other rural groups more than urban entities, though the overall trust of others by rural individuals has declined (Besser 2009). This has changed the rural voting behaviors, as collective action and civic engagement are affected by the loss of group trust and activities participated in by Americans (Besser 2009). This loss of trust in others within rural areas has led to a lack of concern for others in voting behaviors and other forms of civic engagement. Instead of concern for the community as a whole, many rural dwellers have started voting in their own interest rather than group interest (Besser 2009). While this does not seem to reflect strong changes at the polls, there is still a shift in the societal expectations that exist in small towns and among small groups. Before this change, small towns and rural citizens banded together to “fight big government” and to ensure the interests of the areas were being

considered at the polls (Pied 2011). This shift has weakened the political alignment and affiliations of rural areas, changing the way the areas are able to be approached by political candidates. Instead of being able to market to the malcontented populations in rural areas with blanket statements that appeal to the group identity of rural dwellers, politicians must appeal to rural voters as individuals (Cramer 2012).

There are other political repercussions in the divide between rural and urban areas that are in the opposite direction. The way rural voters view and approach government is generally different from the way those in urban areas approach the issues they face. The prevalence in rural poverty and urban poverty are about equal; however, the use of governmental assistance benefits appears to be higher in urban settings, rather than rural areas (Cramer 2012). This is not surprising, considering the challenges of providing the benefits to rural areas as opposed to urban areas. Aspects like transportation are harder to provide to rural areas due to the massive distance between locations in rural settings. For instance, a trip to and from the doctor in an urban setting would benefit multiple people along an assigned bus route. In a rural area, the bus would travel twice or triple the distance, and only benefit a singular person on a specialized transportation route (Conn 2014).

Providing the same services to rural areas as are provided in urban areas would not be an effective use of tax money; however, those living in rural areas are still entitled to the same benefits that are provided to others. This can be seen in other aspects as well, such as subsidized housing for low income families (Conn 2014). Providing housing for people in urban areas also provides access to bus routes, and potential employment opportunities. For those in rural areas, subsidized housing is likely far from opportunities for employment, and therefore does not really help the financial situation of the person receiving the benefits (Conn 2014). Development of

rural areas would help to solve this issue, as a more developed area would benefit more from the good being provided; however, rural groups get frustrated at the urbanization of their communities, and want to preserve the small town way of life they have always known (Conn 2014; Lichter and Brown 2011).

Of the 330 million people in the United States, only 44 million reside in rural areas and small towns—largely in the Midwest (Wuthnow 2018). The small number of people, who are spread thinly across the country, are not the main concern for many politicians that are trying to benefit the entire nation (Wuthnow 2018). Due to a lack of development in these areas, there is a lack of appeal for immigration to these areas, and therefore the need to develop them is also lowered (Weber et. al 2005).

By banding together and accepting other small-town citizens before those from the city, rural citizens have created a group identity among all people living in rural areas nationwide (Cramer 2012). This banding of rural groups creates the common idea across those in the rural areas that urban groups are at an extreme advantage when considering the allocation of funding and public goods (Cramer 2012). This creation of a universal social identity creates the concept of “the other,” creating intense competition for resources, and resentment between groups (Cramer 2012).

This idea that those in urban areas are provided with more benefits than those in rural areas influences the already shaky dynamic between the groups. For many people in rural areas, it appears that the government is favoring urban areas, and providing more benefits with money that is meant to be distributed to all groups and citizens (Conn 2014). In reality, public goods are distributed to the populations that would meaningfully benefit from them. This does not change the sectarian beliefs of individuals in either group. Instead, this appearance of unfair treatment

creates a rift between American citizens as the individuals create mistrust and competition between their respective groups, as well as increases the distrust of government by rural groups (Conn 2014). The dependence on personal relationships in rural areas also contributes to the massive mistrust of government by those living in rural places since the corruption of government is much more visible (Weber et. al 2005). This corruption, especially at such a small level of government, leads rural groups to believe the corruption at higher levels is not only more prevalent, but more significant as well (Weber et. al 2005).

The distrust of government by rural populations is not entirely driven by frustration of the rural/urban divide. As mentioned before, people in rural areas do not feel they are given much, if anything, by the government (Pied 2011). Instead, the main interaction that small towns have with Washington is the implementation of regulations on the day to day lives of citizens (Pied 2011). Rural Americans are given the impression that the government is not useful to them, as it does not provide the same services that urban groups receive, but instead implements regulations and rules to hinder the work they try to do (Wuthnow 2018, Knoke and Henry 1977). The governments' provision of public goods rarely reaches the daily lives of those living in small towns, and the consistent poverty in rural areas leaves individuals unable to procure the goods they need to function (Weber et. al 2005). Due to this feeling of helplessness, rural voters are apathetic, and do not have consistent voting behavior (Knoke and Henry 1977).

Rural areas have a strong sense of neglect when considering the provision of goods and services by the government, as they do not appear to receive the same treatment for the same issues. While rural poverty and urban poverty are both prevalent throughout the nation, politicians and other entities tend to treat the issues the same way, or ignore the rural poverty in its entirety. This lack of meaningful attention gives those in rural areas the feeling that they are

neglected in other ways as well, while urban areas receive not only attention, but benefits as well. The data and analysis approached in this paper attempts to determine if the assumptions of those in rural areas are justified and looks into the allocation of funding to rural and urban areas throughout the Commonwealth of Pennsylvania.

Methodology and Findings

To explore the research question, I utilized the 2017-2018 Winter Service Guide from the Pennsylvania Department of Transportation. This document provided a county-level breakdown of the winter road maintenance budget, as well as actual dollars spent. This budget ensures safe driving conditions for commuters on state roads, and includes snow removal, salt and brine, as well as plow vehicle maintenance. This does not include any funding or maintenance for municipal roads. This project only considers state roads in to understand how state government allocates resources between urban and rural areas. This also allowed for an understanding of the money allocated to the counties as compared to what was actually needed to maintain the roads for a winter season.

The definitions of rural and urban were drawn from the Center for Rural Pennsylvania and each county was coded as either urban or rural. Rural counties contained 248 or fewer individuals per square mile, while urban counties contained 249 or more. Using Census Bureau data from the five-year estimate of the American Community Survey from 2013 to 2017, population per county was also considered in relation to state level funding.

Table 1: Descriptive Statistics Table

Variable	Rural Counties	Urban Counties	Commonwealth of Pennsylvania
Counties	48	19	67
Population	3,422,401	9,368,104	12,790,505
Budget In Millions	\$ 129.4	\$ 90.5	\$ 219.9
Budget Per Person	\$ 37.80	\$ 9.66	\$ 17
Lane Miles	56,786	37,494	94,280
Budget Per Lane Mile	\$ 2,413.72	\$ 2,278.13	\$ 2,332.05
Annual Snowfall In Inches	2,450	575	3,025
Rural counties are defined as possessing 248 or fewer individuals per square mile. This is the metric utilized by the Center for Rural Pennsylvania.			

As Table 1 notes, the Commonwealth of Pennsylvania has 67 counties. Of these 67 counties, 48 are rural counties and 19 are urban. Pennsylvania had a total population of 12.79 million individuals, with 9.36 million residents residing in urban counties and 3.42 million residing in rural counties. In terms of budget, the entire winter maintenance budget was \$219.9 million. Of this budget, \$129.4 million was budgeted for rural counties and \$90.5 million was allotted for urban counties. Statewide per person, the average budget on winter road maintenance is \$17. The average budget per person in urban counties is \$9.66, while the average budget per person in rural counties is \$37.80.

Table 1 gives us other important data that will be discussed more in the below regression analysis. The \$219.9 million budget maintains 94,280 lane miles of state roads throughout the commonwealth. Of this, rural counties contain 57,786 lane miles and urban counties are home to 37,494 lane miles. Thus, rural areas simply have more lane miles than urban areas, which is logical given that rural areas are geographically larger than urban areas in the commonwealth. Table 1 tells us that that the budget per lane mile is not remarkably different for urban and rural counties. In rural counties, the average budget per lane mile is \$2,413.73, while in urban counties, it is \$2,278.13 per mile. As such, the commonwealth largely spends the same per lane mile in urban and rural counties. This makes sense.

Finally, the Winter Service Guide also included average snowfall statewide and per county. Obviously, if one is considering winter road maintenance, one must account for snowfall. Pennsylvania expected to clear an average of 3,025 inches of snowfall across counties between 2017 and 2018. Of this number, the state expected to clear 2,450 combined inches of snow in rural counties and 575 combined inches of snow in urban counties.

Thus, the most prominent features from Table 1 are that there are more rural counties than urban counties. And, correspondingly, the budget, number of lane miles, and average annual snowfall cleared is larger in rural counties than urban counties. Further, per person, more money is spent maintaining roads in rural counties. That said, our multivariate regression paints a more complicated picture of whether urban or rural counties are under-budgeted in terms of this particular public resource.

Table 2: Multivariate Regression Analyses

Independent Variable	Coefficient
Rural Dummy	.0966
	(.0504)
Lane Miles	.0002***
	(.0000)
Average Annual Snowfall	.0018*
	(.0007)
Population	.2838***
	(.0604)
Constant	4.605***
	(.3003)
Adjusted R ²	.7915
N	67
Standard errors in parentheses Note: The Dependent variable is the Winter Maintenance Budget. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$	

After running the multivariate regression on the data collected from the Winter Service Guide, it was easier to determine what the data was truly saying regarding the funding of rural and urban areas, and what actually drives the allocation of the winter transportation budget throughout the commonwealth. Table 2 explains our results. The dependent variable in the study was the Winter Maintenance Budget from the Pennsylvania Department of Transportation. Our independent variables included whether the county was rural or urban, lane miles per county, average annual snowfall cleared from state roads per county, and population per county. The adjusted R square of the model was 0.7915, meaning that 79.15% of the variance in the county budget was explained by the variables being used in the regression. By any measure, this is a robust result. Thus, our model explains a great deal.

The rural/urban variable was run as a dummy variable—rural counties were coded as one, while the urban counties were code as zero. This allowed for a test to be run on the data and to determine the amount of influence the rural or urban categorization of a county had on the budgetary money allocated. The regression reflected that the rural coding of a county was not significant at the .05 level. Thus, the positive correlation between rural areas and budget dollars allocated is not significant.

As we noted, the average annual snowfall cleared from the roads, in inches, was also an independent variable. This result suggest that this independent variable is significant at the .05 level, revealing that snowfall per county plays a role in the allocation of government funding for winter road maintenance. This finding is logical, as the amount of average snowfall cleared would help determine the amount of maintenance in the form of snow removal that would need to take place to maintain clear and safe passage of roadways through the winter.

Population was also considered in this model, and reflected extremely significant results, with a significance level at the .001 level. This reflects that the population of a county plays a major role in the distribution of funds for maintenance of roadways.

The number of lane miles per county was also accounted for in this model, with the results being extremely significant at the .001 level. This level of significance in this regression shows that the number of roadway miles in a county plays a major part in the amount of money budgeted per county. This is not surprising, as the amount of road being maintained would directly impact the amount of money used to take care of roadways.

Overall, the conclusions made by running this model did not provide clear answers to the original research question at hand—are rural or urban areas at a disadvantage for funding and public good distribution? The model suggests that there are other variables besides population density that matter in determining public goods allocation. In other words, while population might matter, clearly, lane miles and snow fall play a role as well. Thus, those living in urban and rural areas must be forced to consider that public goods allocation is far more complicated than simply a political calculation about rewarding political supporters. Based on our data, it appears to be more of an issue of government performing a service to citizens and allocating resources based on service delivery.

Discussion and Conclusion

I began researching this topic to determine which group of people, rural or urban, was justified in their resentment toward the other. Are rural farmers cursing the cities angry for good reason? Are urban groups justified in assuming that money is being sent to rural areas needlessly? Instead, I discovered that neither group is underfunded in a way that should warrant such contention.

While there is plenty of research to support the idea that resentment is present in both rural and urban areas, this paper suggests that it is more of a social issue, rather than an issue related to the way the government and political actors treat each group. There are likely different social and psychological ties to the reason for hatred among rural and urban groups, as the data provided and analyzed showed no major differences in funding between rural and urban areas. This means the contention between groups is not justified on a monetary level, or through governmental favoritism, but is driven by other, non-political, factors.

The data also supports the idea that the budget for transportation maintenance funding is determined by multiple factors, including the miles of road per county, the average snowfall, and the population density per county. While these factors do reflect the characteristics of and differences between rural and urban areas, the actual allocation of funding has little to do with the categorization of counties as rural and urban throughout the commonwealth of Pennsylvania.

I am hopeful that this data and analysis will be used in the future to look more closely into the allocation of funding to rural and urban areas throughout the United States. With such a narrow focus, I am hoping this paper can be applied to bigger questions and research ideas in the realm of rural/urban studies, and that the results may apply to other topics as well.

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