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A REGIONAL APPROACH TO PROVIDING LOCAL WASTEWATER SERVICES

IN YOUNGSTOWN, OHIO: AN EVALUATION OF VARIABLES THAT IMPACT SUCCESS

A Master Thesis

Submitted to the Faculty of American Public University by Carmen S. Conglose

In Partial Fulfillment of the Requirements for the Degree of Master of Public Administration

American Public University

August 2016

Charles Town, WV
DEDICATION

I dedicate this thesis to the memory of my parents, Josephine and Carmen, Sr. Their constant guidance throughout my formative years enabled me to realize that education and learning are life-long processes. Absent the values they instilled in me, I would not be where I am today. I also dedicate this thesis to my wife, Mary Frances. Without her unwavering love and support over the past two years, achieving this educational goal would not have been possible.
ACKNOWLEDGMENTS

I wish to acknowledge several individuals who have played critical roles in helping me to become the person I am today. I am privileged to have had several influential mentors throughout my professional career. I especially recognize in this regard Mr. James Larene, Mr. Richard Marsico, P.E., and Mr. Robert Yohman, P.S. Although they have all departed this life, they left me with invaluable knowledge and insight that I rely upon every day.

I also thank the many professors I have been privileged to learn from at APUS. They all do an excellent job at preparing students to apply new educational skills in the real world.
ABSTRACT OF THE THESIS
A REGIONAL APPROACH TO PROVIDING LOCAL WASTEWATER SERVICES
IN YOUNGSTOWN, OHIO: AN EVALUATION OF VARIABLES THAT IMPACT SUCCESS

By
Carmen S. Conglose
American Public University System, August 14, 2016
Charles Town, West Virginia
Professor Deborah Laufersweiler-Dwyer, PhD, Thesis Professor

When local governments form consortia to jointly provide services within a specified region, prior research suggests that overall service costs can decrease as quality increases. Several studies have also found that regionalizing local wastewater services in such a manner is one area in which the economic benefits are especially rewarding. Despite these obvious advantages, however, prior research fails to identify reasons why regionalization is not more widely utilized among local public agencies. The current research attempts to fill this knowledge gap by investigating how Youngstown, Ohio and other similar local communities may eclipse some of the common non-economic barriers that inhibit the regionalization choice. By studying four cases across the nation in which regionalizing wastewater services has met with mixed results, data will be analyzed and measured via a regionalization evaluative continuum in order to produce a Regional Suitability Index that may be applied to Youngstown’s nagging problem of finding ways to provide affordable and sustainable wastewater services in the face of declining resources. Faced with formidable institutional and social challenges, the findings suggest that Youngstown is currently less than an ideal candidate for regionalization.
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A REGIONAL APPROACH TO PROVIDING LOCAL WASTEWATER SERVICES IN YOUNGSTOWN, OHIO: AN EVALUATION OF VARIABLES

Introduction

Public sector administrators have become all too familiar with the edict that they learn to do more with less. Despite dwindling resources in recent years, citizens still expect that government organizations at all levels somehow continue to provide the same, and in many cases more in the way of public services. The rising demand for more effective and efficient public services, however, has accompanied recent prolonged periods of economic stagnancy and lower tax revenues. Research by Gordon (2012) found that during the peak of the recent national economic recession, by 2009 governmental tax revenues across the nation fell by nearly 17 percent, while some specific revenue streams, such as local income taxes, fell by as much as 27 percent in certain locales. The business sector’s recovery from the recession’s effects has been painstakingly slow. Statistical data maintained by the World Bank Group (2016) indicates that since 2008, the United States’ Gross Domestic Product (GDP), as an aggregate indicator of economic growth, has remained virtually unchanged. As a result, governmental tax revenues have struggled to return to pre-recession levels. Nevertheless, each year taxpayers expect better quality highways, higher performing school systems, and safer neighborhoods. Yet very few citizens appear willing to pay more taxes in exchange for increased quality and quantities of these types of public services. As the recent economic crisis has also resulted in increasing numbers of residents living below the poverty level, some states, such as Ohio, have expanded entitlement programs such as Medicaid in order to provide basic medical care to the poor. Unfortunately, Ohio has assigned a significant portion of the financial burden of these additional services to local county governments.
The increasing demands placed on local governments also come at a time when many agencies are operating with fewer personnel than ever before. Willhide (2014) reports that the aggregate number of local government employees across the nation has been declining at an annual rate of 1.1 percent per year since 2009. Compounding the effects of this personnel deficit, local governments are also receiving decreased levels of financial support from federal and state governments. Theiss (2013) identifies cuts to federal government programs that have reduced entitlement dollars to local governments nationwide by $5.1 billion between 2010 and 2013.

As many government agencies have navigated through budget deficits, dwindling personnel resources, and increased service demands, fulfilling the edict to do more with less has required increased innovation. Some agencies, such as the Indiana Turnpike Commission, have formed partnerships with private sector organizations in order to reduce taxpayers’ costs (Schalliol, 2006). Others, such as the city of Toledo, Ohio have completely privatized essential public services such as solid waste collection in order to allocate larger shares of local revenues to other essential functions (National Solid Waste Management Association, n.d.). Relatively few local governments, however, have chosen regionalization as an innovative method of delivering public services to residents. Under a regionalized approach, several neighboring local agencies unite to collectively provide services over a wide geographic area that transcends traditional political subdivision barriers, thereby capturing economies of scale capable of lowering per capita service costs throughout the entire region being served.

Several prior studies suggest that regionalization can provide a number of both economic and non-economic advantages to citizens within participating regions (Crawford & Lewis, 2004; Dodge, 2010; Sorensen, 2006). Regional approaches to the delivery of local services, however, is not widely utilized. The lack of more universal adoption of the regional service delivery
approach therefore suggests that other non-economic factors may tend to abrogate the economic benefits. One type of public service that has been subjected to underutilized regionalization is wastewater collection and treatment. Existing studies suggest that regionalized wastewater services are particularly cost-effective, since the physical process is highly dependent on gravity as dictated by the natural topography of land, irrespective of political boundaries (Houston-Galveston Area Council, 2009). Conversely, treatment facilities that are operated solely to service specific political subdivisions are generally costlier to build and operate. Wastewater services therefore present a cogent model through which regionalization may be studied and evaluated.

A comprehensive analysis of conditions surrounding the current operation of Youngstown, Ohio’s wastewater department reveals the existence of several institutional, social, and political barriers that threaten to obstruct its ability to utilize regionalization or multi-agency consortium approaches as a means to provide optimally effective and efficient local public services. As a result, Youngstown is one of many communities that has not attempted to regionalize its wastewater services despite the prospect of significant cost savings. The Youngstown region’s lack of interest in regionalization is likely a result of perceived insurmountable chasms between city and potential suburban regional partners that appear to make regionalization an unpopular option.

The following research will identify some of the barriers that Youngstown, like many other local public agencies face in funding services via traditional delivery methods. It will be argued that a more innovative approach, based upon aggregating and equitably sharing wastewater collection and treatment costs among multiple neighboring agencies within a region is capable of providing all participating ratepayers with more efficient and effective levels of
service. It will be further argued that Youngstown, like many other communities, fails to capture the economic and qualitative benefits associated with the regionalization of public services due to its inability to overcome some of the common political, social, and institutional barriers. By identifying a range of independent variables that Youngstown and other similar local communities may rely upon to predict the outcomes of regionalization efforts, the research will endeavor to determine Youngstown’s Regionalization Suitability Index (RSI), which will answer the following research question:

*How can a regional approach to providing local public services be successfully implemented in a manner that achieves political, social, and institutional acceptability, while providing citizens of Youngstown and surrounding communities with optimally efficient and effective levels of wastewater services?*

**Background**

**The Nationwide Need for Local Service Innovation**

Periods of chronic economic distress can be especially damaging to local governments. When conditions such as inflation, high unemployment rates, and decreasing private sector investment become prevalent, local governments may suffer not only directly, but collaterally as well. The direct impact results primarily from decreased local tax revenue collections. When local businesses curtail activities and employ less people, fewer tax contributors are left to support the overall cost of providing local public services. Since most local governments also rely upon state and federal tax dollars to sustain operations, a collateral impact may be experienced by economic downturns elsewhere, even when the local economy remains reasonably stable and robust. Domestic economies are now also influenced to a significant degree by events that occur throughout the world. Consequently, as many domestic companies buy and sell goods globally, local governments must now be concerned not only with the impacts
of local, state, and nationwide economic downturns, but with troubled economies on the other side of the world as well.

**Youngstown’s Plight**

An investigation of Youngstown’s current traditional method of operating its wastewater collection and treatment system reveals some common challenges that many local public agencies face during trying economic times. Originally constructed during the early 1960s, the system currently represents approximately $90 million in public investment dollars (City of Youngstown website, 2016). During its years of operation, the system has been expanded and upgraded on several occasions at significant cost, in order to meet the community’s needs and to comply with increasingly onerous clean water regulations and mandates. For a number of years, however, Youngstown’s existing wastewater revenue stream has been insufficient to sustain operations in a manner that consistently meets state and federal regulatory agency standards.

Increasing revenue by raising user rates is neither a politically popular nor a realistic alternative in light of the community’s low median household income (MHI) level, and citizens’ generalized unwillingness to pay more taxes and fees.

Throughout its years of operation, Youngstown’s wastewater system has become an increasing economic burden on the ratepayers who provide revenue for its operation. The wastewater enterprise fund collections have been steadily rising as a result of past rate increases, currently generating nearly $20 million annually (City of Youngstown Website, 2016). Despite the steadily increasing rate structure, however, additional future rate increases are also scheduled in order to meet projected operational and capital project funding requirements. A portion of the future revenue demand is required to construct mandated projects that will eliminate long-standing sewage overflow discharges into rivers and streams during heavy rain events. The
remainder of the future revenue burden will fund the escalating costs associated with Youngstown’s traditional method of operating and maintaining the system on a daily basis.

The wastewater fees currently paid by Youngstown users represent one of their most significant household utility expenses. As compared to a percentage of MHI, Youngstown’s current wastewater user fee is one of the highest in the state (Red Oak Consulting, 2009). In conjunction with the future planned rate increases, and in view of Youngstown’s traditionally low MHI, wastewater rates may soon become unaffordable to a significant number of Youngstown residents. A quandary familiar to any number of struggling communities across the nation, Youngstown’s administrators are challenged with discovering a new and innovative method of wastewater system operation that is capable of reducing costs and optimizing service delivery.

Population trends within Youngstown and the surrounding region also suggest that regionalization of wastewater services may at some point become inevitable. Red Oak Consulting (2009), hired by Youngstown to determine future wastewater rate structures, determined that as residents have left urban areas in favor of suburban living, Youngstown’s sewer user base has steadily declined by approximately 1.4% per year, a trend which is predicted to continue into the foreseeable future. This declining customer base suggests that any future rate increases will likely be offset by revenue losses of approximately $2,000,000 per year. Therefore, merely maintaining the 2009 baseline revenue demands identified in the study will require an $84.00 annual increase to the average ratepayer’s sewer bill.

As a practical display of the relative economic benefit of regionalization, Red Oak Consulting (2009) also provided an important perspective in their study by comparing Youngstown’s wastewater rates with those in other regionalized systems in Ohio. The
comparison revealed that several existing regionalized wastewater systems in Ohio had rate structures considerably more affordable than Youngstown’s when compared to the community’s annual Median Household Income (MHI) levels. Updated with 2013 data, Table 1 suggests that this affordability trend has continued. The 2013 residential rate for Dayton, Ohio’s regionalized system was 1.04 percent of the community’s annual MHI, while Toledo, Ohio’s regionalized rate was 1.38 percent of its annual MHI. Both of these rates are below the USEPA’s (2002) 2.0 percent affordability threshold, and compare favorably to Youngstown’s 3.60 percent unaffordable rate. Although Akron’s regionalized rate exceeded USEPA affordability threshold, at 2.28 percent of MHI, it is still considerably below Youngstown’s rate.

<table>
<thead>
<tr>
<th>City</th>
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<th>Ann. Avg. Sewer Rate</th>
<th>Percent of Sewer to MHI</th>
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<tr>
<td>† Dayton</td>
<td>$28,174 *</td>
<td>$294 **</td>
<td>1.04</td>
</tr>
<tr>
<td>† Akron</td>
<td>$34,359 *</td>
<td>$784 **</td>
<td>2.28</td>
</tr>
<tr>
<td>† Toledo</td>
<td>$33,485 *</td>
<td>$461 **</td>
<td>1.38</td>
</tr>
<tr>
<td>Youngstown</td>
<td>$24,361 *</td>
<td>$879 **</td>
<td>3.60</td>
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Table 1 – Wastewater Affordability among Ohio Cities
Data Sources: * U.S. Census Bureau (2014); ** Ohio EPA (2013): † - Regionalized Systems

A study conducted by the Ohio Environmental Protection Agency (OEPA) (2013) also found that in comparison to all other Ohio peer cities of similar size and sewer system design, Youngstown has the highest average monthly residential sewer rates. When Youngstown’s high sewer rate is compared against its $24,361 annual Median Household Income (MHI) level, the result suggests that Youngstown residents pay a considerably greater percentage of their income for wastewater services than any of the peer communities (United States Census Bureau, 2014). Assuming that Youngstown’s MHI remains relatively stable, its sewer rates will become increasingly unaffordable in future years as additional increases are implemented to keep pace
with escalating operation, maintenance, and capital project demands associated with the current traditional service delivery method.

One of the most logical types of innovation to consider is regionalization of wastewater facilities among Youngstown and its neighboring unincorporated county areas. These outlying areas seem to be physically well-suited to joining Youngstown in becoming part of a regionalized system for several reasons. First, Youngstown’s wastewater treatment plant is located in one of the lowest elevation points within the region, and is therefore able to capture the economic advantages associated with gravity sewer flow. Second, Youngstown already treats quantities of sewer flow from portions of these outlying areas pursuant to long-standing permanent agreements. As a disincentive toward regionalization, however, these agreements have become inequitable in favor of non-resident customers in light of current operational conditions. Consequently, the agreements likely create artificially low rate structures for non-resident customers. Therefore, a regionalized system, although beneficial to Youngstown residents, may not be as attractive to other prospective regional participants.

**Literature Review**

Despite its obvious economic benefits, the virtues of regionalization have been viewed critically through several different analytical lenses. Earlier studies suggested that regionalization was a highly favored strategic planning tool, but a major challenge toward its effectiveness involved the ability to distill multiple government identities into one cohesive unit capable of responding to the needs of a diverse range of constituents (Baldassare, Hassol, Hoffman, & Kanarek, 1996). Subsequently, others suggested that when viewed from a public choice perspective, regionalization pre-empts the dynamic process that communities naturally engage in as they compete for residents. The resulting monopoly that is created through the denial of public choice is then claimed to create a disincentive for government efficiency and effectiveness.
(Saiger, 2009). From a related public choice perspective, some also argue that regionalization is both socially inequitable and politically unpopular, since it tends to favor elite interests, and effectually benefits poorer participating communities at the expense of more affluent ones (Sorensen, 2006).

It has also been argued that regionalization is an impractical solution to local government service delivery problems due to the fundamental legal and institutional barriers that exist between various government entities. While such barriers are not insurmountable, they nonetheless have been viewed as contributing to the overt complexity associated with implementing regionalized services (Prager, 2010). Finally, it has been suggested that the overriding barrier to regionalizing services may be inherently political in nature. As a result, decisions about regionalization typically lack rationality as they ignore critically important economic and mechanistic factors (Maher, 2015).

The following comprehensive review of regionalization literature from such economic, institutional, social, and political impact perspectives will therefore identify a number of factors that additional research efforts should explore. The subsequent discovery of congruent and divergent scholarly opinions within the literature will then add clarity and focus to the current research endeavor by suggesting areas that most acutely require additional investigation.

**Economic Impacts**

One aspect of regionalization that is well-founded within prior literature and professional studies is its ability to yield economic benefits when implemented under favorable conditions. Several prior studies provide evidence suggesting that local government regionalization efforts have been generally successful in reducing overall service costs, thereby making public services more affordable to a wider range of citizens. McAndrews & Voith (1993) proposed that one of
the ways in which regionalization reduces fixed service costs is by increasing the customer base that consumes such services, and then skewing the payment distribution of the total costs. Their theory assumes that regionalized public authorities naturally have more resources to offer than non-regionalized authorities. They are therefore better able to attract new service customers, including large corporate customers that typically consume larger shares of services as compared to residential customers. By increasing the total volume of services produced, the total per-customer cost becomes reduced as economies of scale are realized. The ability of regionalized governments to attract more larger-consuming corporate service customers then in effect establishes a social welfare equation whereby more wealthy corporate customers actually assist in reducing and offsetting a portion of the costs of services that would otherwise be paid by less affluent residential customers.

Kaufman (2010) outlines some of the economic advantages that regionalized school districts have realized for many years when created under favorable institutional conditions. In the 42 states where the creation of Educational Service Agencies (ESAs) is authorized by state statute, multiple communities are able join to collectively provide public educational services throughout a defined geographic area, irrespective of political boundaries. Kaufman claims that a total of 620 ESAs have been created, and have received widespread public acceptance for lowering overall educational costs and producing higher levels of educational services.

**Institutional Impacts**

A review of prevailing literature also suggests that Osborne’s & Gabler’s (1992) *Reinventing Government* initiative has in many respects transformed contemporary political and administrative ideology regarding how governmental institutions should be structured. By suggesting that government needed to be streamlined, reorganized, and made more responsive,
Reinventing Government created the basis for regionalization and other innovative public service delivery approaches. Reinventing Government principles also suggested that government decision makers should embrace traditional private sector business concepts such as the need to compete for customers, and the value of developing economies of scale in order optimize efficiency and effectiveness. Reinventing Government proponents believe that these same types of private sector profit enhancing objectives can act as prime motivators in reducing both the high cost and complexity typically associated with government’s delivery of services.

The increased popularity of the Reinventing Government ideology has also suggested changes in the institutional process through which public agencies measure organizational performance and success (Brudney, Hebert, & Wright, 1999). The traditional focus on measuring outputs, or quantities of public goods and services produced, has gradually shifted toward measuring outcomes in terms of overall organizational effectiveness, goal achievement, and customer satisfaction. This trend suggests that local governments now focus less on counting units of services provided. Instead, the metric for success has shifted to measuring the degree of goal achievement and citizens’ overall levels of satisfaction with service delivery. For example, progressive communities no longer count how many potholes have been filled or how many arrests have been made. Instead, performance is measured via the overall improvement in the condition of streets, and the overall increase in public safety in terms of crime rate reduction.

As public sector organizations have adopted the new philosophy of performance measurement, service delivery decision making has expanded beyond traditional economic considerations. For example, Pouder (1996) suggests that institutional, structural, and organizational considerations should be critical elements of the service-related decision making process. In addition, political ideologies and the nature of relationships between politicians and
other organizational stakeholders are also considered to be important decision making factors as well.

From an institutional perspective, some literature also suggests that particular governmental frameworks are capable of significantly influencing both the level of interest and ultimate success of regionalization efforts. Murray (2010) contends that the rather unique method of apportioning power and authority to local governments presents significant challenges to some local communities attempting to regionalize. For example, efforts in Massachusetts to regionalize local government services have been impeded by a lack of congruency among various local government structures. Local governments which have adopted an optional home rule form of governance as permitted through their state constitutional provisions have more flexibility to amend local laws and ordinances in order to easily facilitate regional agreements with other governmental units. Conversely, those which operate via strict statutory provisions are dependent upon state oversight and approval of such agreements. When statutory and home rule communities jointly pursue regional collaboration, the formation of regionalization agreements that also meet state statutory requirements can become problematic.

The difficulty that Murray (2010) cites in attempting to unite local government units having differing structures is at least indirectly attributable to a long-standing constitutional provision. The United States Constitution’s Tenth Amendment establishes the shared governance concept referred to as federalism. Under federalism, states are endowed with all powers not specifically granted to the federal government. (Easterbrook, 2013). The resulting governance relationship therefore suggests that states have rather liberal power to regulate most activities that citizens regularly engage in. States’ governing powers, however, also extend to their subservient local government units as well, since the Constitution is silent with regard to how
states and local governments should share regulatory power and authority. Although home rule authority may appear to only impact state and federal government interactions, its effect on local government regionalization efforts can be profound. Courts have found that local governments possess no self-governing authorities, including the authority to form regional consortiums, except for those powers which are explicitly granted to them by the states (*Walker v. Toledo*, 2013).

**Social Impacts**

Some literature also suggests that regionalization efforts may be impacted by certain social dynamics and perceptions present within the participating communities. A compelling argument in this regard is presented by Saiger (2009), wherein regionalism is viewed as an invasion of Tiebout’s (1956) public choice theory, since it limits citizens’ rights to select domicile locations that best suit their needs and desires.

Tiebout’s (1956) public choice perspective proposed a model for how local governments should optimize expenditures for public goods. Quite contrary to the collaborative regionalization concept, public choice theory suggests that the creation of market environments in which government units are forced to compete for customers will optimize public service outcomes. Through the public choice approach, Tiebout suggested a method whereby local governments may determine a selection of public goods and resulting taxing levels which consumers find most attractive. In developing the model, he portrays citizens as consumers of public goods, similar to the manner in which the general public is a consumer of private goods. Accordingly, the optimal levels of public goods and taxes are then determined through an economic-based supply and demand analysis.

---

1 See *Walker v. Toledo*, 2013-Ohio-2809
Tiebout’s (1956) public choice theory assumes several conditions to be consistent among all consumers of public goods. One of the most critical relating to regionalization is that consumers of public services are highly mobile, and are therefore free to choose a community in which to live among multiple choices. This freedom of mobility results in unrestricted competition through which consumers determine what they are willing to pay, and governments determine optimal levels of pricing and supply, in accordance with demand presented by the fully mobile consumer. Tiebout (1956) contends consumers will eventually make choices among competing communities that provide the services (public goods) they most desire, at prices (taxation levels) they are most willing to pay.

Another important implication of Tiebout’s (1956) model relating to regionalization is that it assumes an absence of external economies of scale as determinants of service costs. Under such an assumption, costs associated with public goods provided in each community are completely paid for by its residents. Likewise, all benefits provided by those goods are also consumed by its residents. Therefore, contrary to the regionalization approach in which total service costs are evenly distributed among all participating communities, public choice suggests that optimal conditions are achieved when each community independently determines how to price and provide the services at levels that make them most attractive to consumers.

Saiger (2009) claims that as regionalizing the services of multiple government units effectively removes the public choice element of competition between communities, it also nullifies the attractiveness of one community over another. Absent relative differences in social desirability among communities, the entire region then tends to regress toward mediocrity. Additionally, there is no incentive for regionalized governments to provide high levels of services to those residents willing to pay for exclusivity. Instead, service levels and taxes in
regionalized communities tend to stabilize around mean values of each, representative of what
the average consumer is willing to accept. Such an argument leads to the suggestion that
regionalization may be more socially desirable among communities which share similar
demographic identities, and less desirable among communities in which large variations exist
between factors such as residents’ ages, races, ethnicities, education levels, and income levels.

**Political Impacts**

Sorensen (2006) suggests that establishing regionalized governance can be accompanied
by several types of political transaction costs. First, when individual governing bodies among the
various regional participants are comprised of dissimilar political affiliations, it is likely that
politicians from each participating government will need to concede certain policy preferences in
favor of a slate of consensus policies acceptable to a majority of the regional body.
Consequently, politicians may be required to make policy decisions that fail to align with the
desires of citizens responsible for their election to office. As a result, elected officials tend to
become politically vulnerable as they are unable to fulfill certain campaign promises. Secondly,
Sorensen (2006) claims that regionalization tends to favor political elite interests at the expense
of less powerful ones. The elitist penchant occurs due to the fact that larger regional government
participants with more resources tend to dominate administrative policy and decision making
within regionalized bodies. As a result, politicians from smaller regional participants tend to lose
the levels of power and authority they possessed prior to regionalization.

In light of the political costs associated with complete regionalization of government
units, Maher (2015) suggests that selectively consolidating certain services among regional
participants is typically a more palatable option. Ideally, the selection of services to be
consolidated should result from exhaustive impact and cost-benefit studies, since the
regionalization of labor intense services such as law enforcement are likely not as economically feasible as other more technically-oriented services such as planning or wastewater treatment. In a practical context, however, Maher maintains that such decisions about service consolidation are often arrived at primarily based on prevailing political ideologies and public opinion. As a result, the actual value of regionalization often remains unrecognized.

**Critical Impact Areas**

Summarily, the body of literature examined suggests two phenomena. First, the economic impacts of regionalization are widely recognized and generally considered to be positive, but are highly dependent on a range of esoteric conditions that are not easily defined. Secondly, the critical impacts that are most likely to produce such conditions arise from institutional, social, and political considerations. When viewed from such a perspective, it becomes clear that an initial step in filling the gap in the current literature entails an identification of specific variables, that when applied to real-world regionalization situations, are capable of predicting the likelihood of success.

Institutionally, the literature examined suggests that congruency among structural frameworks and management ideologies tend to produce the most favorable regional partnerships. Socially, the degree of demographic homogeneity and similarities in community identities seem to be critical factors. Politically, the party affiliations of residents and elected officials, coupled with the degree to which elected officials are able to retain political power and authority seem to be the most influential considerations.

**Regionalization in Practice**

The following overview of four (4) relevant cases of regionalized wastewater districts in Ohio, Pennsylvania, Michigan, and California will further assist the current research efforts in
developing, applying, and confirming the effects of selected variables in real-world conditions. Data extracted from the studies and related sources will also help to provide an avenue for expanding the research scope beyond the basic discovery of independent variables. The development of an indexing method based on relative differences among participating agencies will facilitate measuring the strength each variable exerts in impacting the communities’ regionalization efforts. Additional discussion regarding specific data to be derived from the studies, along with an explanation of the proposed processes for data collection, data presentation, and indexing process will be presented in the subsequent methodology section of the research.

Allegheny County Sanitary Authority

The Allegheny County (Pennsylvania) Sanitary Authority (ALCOSAN) is a large regionalized wastewater district comprised of 83 communities and over 900,000 residents within western Pennsylvania (ALCOSAN, 2013). The city of Pittsburgh is ALCOSAN’s predominant and most populous participant, with much smaller portions of neighboring unincorporated counties, townships, and boroughs comprising the remainder of the governmental participants. As one of the pioneering wastewater authorities in Pennsylvania, ALCOSAN has grown steadily since first beginning to provide rudimentary wastewater treatment services in 1946 to a small watershed area tributary to a western branch of the Allegheny River. Over the ensuing years, additional communities became members of ALCOSAN as a cost-effective alternative to constructing or upgrading their own treatment facilities required to meet clean water standards.
A review of U.S. Census Bureau (2014) data suggests ALCOSAN’s service area is comprised of a mixture of highly urbanized, suburban, and rural/agricultural land. As such, demographic identities vary considerably among the various communities. The region is also currently politically diverse, with 72 percent of rural residents voting democrat, and 81 percent of urban residents voting republican in the 2008 presidential election (Frey & Teixeira, 2008). Historically, Allegheny County, as well as its predominant city of Pittsburgh, have elected both Republicans and Democrats to office. However, over the past four presidential elections, voters have supported the democrat candidate exclusively (Frey & Teixeira, 2008).

The institutional structure of Pennsylvania state government, as well as the manner in which state law sets forth the process of governmental interaction is somewhat unique and seems to facilitate the collaboration needed for regionalization. Pennsylvania is widely known as the birthplace on local home rule government. The origin of home rule in North America can be traced back to 1681 when British explorer William Penn was granted authority by King Charles
II to self-govern a sixteen million acre plot of land that would later become the state of Pennsylvania (Ooms & Tracewski, 2009). In modern times, Pennsylvania has remained a leader in home rule local government, with home rule being the presumptive form of county government, unless otherwise authorized under specific state statutes. Counties then have the authority to grant or deny home rule status to their subservient local government units.

**Houston-Galveston, Texas Regional Wastewater Facility**

The Houston-Galveston, Texas region is currently engaged in the early implementation stage of providing regionalized wastewater services. (Houston-Galveston Area Council, 2009). Regionalization planning efforts first began in the early 1970s, at a time when initial federal clean water regulations first began to significantly increase costs associated with wastewater treatment. The ultimate decision to regionalize services, however, was precipitated by explosive population growth in certain areas of the region during the late 1990s and early 2000s. As the demand for wastewater services increased exponentially in some communities, the capital outlay needed to meet such demand made the construction of individual community facilities increasingly impractical and unaffordable.
Predominantly situated in Harris County and the city of Houston, the region’s demographic identity is reasonably congruent, with relatively small variations in MHIs between regional participants. Except for the Houston metropolitan area, land use is predominantly suburban and agricultural, with approximately 76 percent of total land dedicated to single family dwellings (Harris County, 2009). Historically, Harris County voters have strongly supported Republican political candidates. They have overwhelmingly voted for every Republican Presidential candidate from 1956 through 2004 (Texas State Historical Association, 2004). More
recently, however, the region appears deeply divided with respect to its political identity. Contrary to the majority of Texas counties, voters were almost evenly divided between democrat (49.4%) and republican (49.3%) candidates in the 2012 presidential election (Politico, 2012a).

Texas state government provides the home rule governance option only to cities with populations greater than 5,000 (Texas State Historical Association, 2015). All other areas are governed by state statutory requirements. Aside from some small rural unincorporated areas, virtually all participating communities within the Houston Galveston region exercise home rule authority.

**San Jose-Santa Clara, California Regional Wastewater Facility**

Wastewater treatment functions within Santa Clara County gradually transitioned into a collaborative regional effort over a 25 year period (City of San Jose, 2016). The initial treatment plant was constructed by the city of San Jose during the late 1950s. In 1964, the plant first became a regional facility when the city of Santa Clara became part owner, and the plant was expanded to meet recently imposed secondary treatment regulations. By the late 1970s, all other political subdivisions within the Santa Clara County region became regional participants as well. Organizationally, the wastewater system is managed and operated solely by the city of San Jose. However, a seven member advisory board comprised of elected officials from all participating communities must approve the development and implementation of all programs and policies.

Residents of participating cities share similar demographic identities, including median household incomes, educational achievement levels, and ethnic backgrounds (U.S. Census Bureau, 2014). In addition, the majority of land in both counties is classified as urbanized (Santa Clara County, 2013). McGhee (2011) suggests that historically, the region has a long-standing political identity that is decidedly democratic. This identity has also carried forward to the
current day as well, since nearly 70 percent of voters favoring President Barack Obama in both the 2008 and 2012 presidential elections (Politico, 2012b).

![Figure 3 – San Jose-Santa Clara Regional Service Areas](image)

The California State Constitution affords all cities the option to adopt their own charters and become home rule cities (League of California Cities, 2016). The cities of Santa Clara and San Jose both possess home rule authority pursuant to California State Statutory provisions. None of the five other communities participating in the San Jose-Santa Clara Regional Wastewater Facility possess home rule authority.
**Pontiac, Michigan’s Unsuccessful Regionalization Efforts**

The City of Pontiac, Michigan mounted an unsuccessful attempt to regionalize wastewater services with surrounding Oakland County government units during the mid-2000s. Pontiac commissioned a regional wastewater feasibility study in 2007, which found regionalization to be technically feasible, and capable of reducing costs for all potential regional participants (URS Corporation, 2007). In addition, the URS study determined that a regionalized approach would increase overall region-wide efficiency by more fully utilizing existing unused capacity within Pontiac’s wastewater plant. Despite these apparent benefits, however, potential regional participants were unable to reach a suitable agreement regarding how to assign responsibility for prior debt obligations, and how to share future operation, maintenance, and capital costs (Blitchok, 2012). Instead, Pontiac eventually sold its reserve wastewater plant capacity in 2012 to Oakland County, effectively ending any future possibility of a truly regionalized system (Blitchok, 2012).

In a social context, Pontiac and the surrounding Oakland County region have significantly diverse identities. Dissimilarities in MHI, education levels, and ethnic backgrounds are quite profound (U.S. Census Bureau, 2014). These dissimilarities also extend to political party preferences as well. Around the time period in which regionalization was being considered, the region was politically divided. This divide is evidenced by the 2012 presidential election results in which Oakland County voters narrowly favored the Democrat candidate by a 55% to 44% margin (Politico, 2012c).
Pontiac became a home rule city in 1982 pursuant to permissive Michigan state constitutional provisions (City of Pontiac, 2016). Among the other potential regional participants, including Oakland County, the cities of Lake Angelus and Auburn Hills, and the townships of Bloomfield and Orion; none possess home rule authority.

The discovery of critical regionalization impact areas via the preceding literature review and overview of prior regionalization attempts will assist in establishing the basis for the conduct of research. The following theoretical framework and methodology sections will suggest ways to operationalize relevant institutional, social, and political phenomena in order to select measureable variables. The methodology will also detail the process of collecting applicable data, the development of an experimental process, and the testing of several hypotheses about how to accurately predict the likelihood of successfully regionalizing Youngstown’s wastewater system.
Theoretical Framework

The most fundamental unanswered question about regionalization concerns whether the end product is worth the various non-economic costs. Although the literature previously examined suggests that regionalization imposes costs related to institutional, social, and political factors, it does not conclusively point to a process for measuring cost-benefit of any of these factors in non-economic terms. It is therefore initially necessary to identify a theoretical framework capable of establishing a suitable analytical foundation through which the costs of regionalization may be evaluated and subsequently measured. Risk-reward theory as it applies to public sector decision making provides one such basis for viewing the measurable impacts of regionalization.

Reiss & Young (2006) suggest that viewing the cost-benefit evaluation that typically occurs within government agencies in terms of such risk-reward theory is especially applicable to predicting how government actors will make decisions, particularly when costs may be viewed in terms of non-economic risk factors. In general terms, Fudge & Schlacter (1999) claim as people undertake typical risk-reward evaluation processes they are motivated to act in certain ways if they perceive that the potential rewards are worth the risks of their actions. In the public sector, the risk-reward process frequently involves weighing a range of factors that collectively determine whether the perceived costs and benefits of policy decisions are worth the risks they impose on the sponsoring agency and their elected policy makers. For example, if citizens find such services to be unacceptable, they may be resistant to future policy programs the agency proposes. In addition, they may also cease to support the future re-election efforts of the elected officials responsible for sponsoring the programs. Conversely, if citizens find the programs to be beneficial, the agency and the sponsoring policy makers share in the rewards. Since the public’s perception of cost and benefit is seldom universal, however, Reiss & Young (2006) further
suggest that the risk-reward decision making process in the public sector often becomes complex, and at times irrational. It is therefore essential to employ methods that facilitate simplicity and rationality during the evaluation of risk-reward factors.

Kaufman (2010) sets forth one such method that involves the use of an evaluative continuum which is adaptable for use in numerically measuring how various regionalization impact variables may combine to predict regionalization success (Figure 5). By assigning varying costs (in terms of levels of risk), and return on investment (ROI) (in terms of reward) to a range of possible actions, Kaufman suggests that the action point midway between the two conditions represents the point of equilibrium at which risk and ROI are most favorably balanced. Figure 5 illustrates how Kaufman’s evaluative continuum may be utilized in the current research to determine conditions that present the most suitable blend of risk and ROI in the context of predicting regionalization success.

Figure 5 – Regionalization Evaluative Continuum
Adapted from Kaufman (2010; p.10)
Given that the literature examined suggests there are three non-economic categories of factors which present regionalization risk-reward scenarios, independent variables selected for measurement in each category will be weighted so that ideal congruency (equilibrium between risk and ROI) in each category will yield a value of 0.5, which represents one-third of the 1.5 locus on the continuum scale. When weighted values from all three impact categories are combined, the summation will yield a Regional Suitability Index (RSI) that suggests relative suitability with respect to the 1.5 optimal value. For demonstration purposes, the following Sample Equation A assumes that two independent variables have been assigned to each category, and that the gathered data for a community suggests ideal congruency between conditions:

\[
X = \frac{\text{Institutional} \ [ (0.50_1 + 0.50_2) ] + \text{Social} \ [ (0.50_3 + 0.50_4) ] + \text{Political} \ [ (0.50_5 + 0.50_6) ]}{2} = 1.5
\]

Where: \( X = \text{Regionalization Suitability Index (RSI)} \)

The above described theoretical framework will be utilized to evaluate and test three hypotheses in regard to how various institutional, social, and political factors are predicted to impact efforts to regionalize wastewater facilities. As previously discussed in the Literature Review section, case studies regarding the wastewater regionalization efforts of ALCOSAN (Allegheny County, PA); Houston-Galveston, Texas; San Jose-Santa Clara, California; and Pontiac, Michigan will be utilized to test the hypotheses. While all of these communities have engaged in efforts to regionalize wastewater facilities among large geographic areas, not all have been successful. Therefore, applying the theoretical approach to actual situational factors present within these communities will facilitate transforming the theory into practice, and will reveal whether the selected variables create the predicted actions. Figure 6 conceptualizes how the
selected situational factors have contributed to the development of three hypotheses proposed to predict regionalization efforts among the communities examined.

![Figure 6 – Conceptualization of Regionalization Impact Factors](image)

**Hypothesis 1:** High congruency among the institutional variable of governmental structures between predominant participant(s) and the entire region predicts optimal regionalization suitability.

**Hypothesis 2:** High congruency among social variables of income levels, educational backgrounds, and racial backgrounds between residents of predominant participant(s) and residents of the entire region predict optimal regionalization suitability.

**Hypothesis 3:** High congruency among the political variable of political party unity within the entire region predicts optimal regionalization suitability.

The following methodology section will further detail the specific data sources, how the theoretical framework will be utilized to evaluate the data, and how the data will be organized, analyzed, presented, and checked in order to test the hypotheses in a manner that is directly relatable to the initial thesis statement and the central research question.

**Research Design/Methodology**
The research methodology will employ both quantitative and qualitative data collection processes, with the objective of testing the relative strengths of the range of independent variables selected to predict the occurrence of the dependent variable of optimal regionalization of local wastewater facilities. Although a mixed methods approach will be utilized, the research will be epistemologically rooted within specific institutional, social, and political contexts of the typical local government regionalization process. The central research question to be answered is:

*How can a regional approach to providing local public services be successfully implemented in a manner that achieves political, social, and institutional acceptability, while providing citizens of Youngstown and surrounding communities with optimally efficient and effective levels of wastewater services?*

**Experimental Design**

Figure 7 graphically depicts the six-step analytical process that will comprise a methodology capable of discovering data that adequately tests the hypotheses and answers the research question. The initial step in the process will be to determine the nature and procedural elements of the experimental design. In this case, the design consists of discovering a range of independent variables, and then applying them to cases of successful and unsuccessful regionalization efforts. In doing so, the validity of the three hypotheses identified within the theoretical framework will be either confirmed or contradicted. Selecting variables that can be used to test the hypotheses first requires that the discovered institutional, social, and political impacts of regionalization be operationalized. This will entail identifying various aspects of each condition, and then determining relevant ways in which each aspect may be applied as a measure
of the condition regarding the extent to which it impacts the community’s regionalization suitability.

![Figure 7 - Research Methodology Model](image-url)

The literature previously examined suggests that institutional impacts arise primarily from the degree of government structural congruency between regional participants (Murray, 2010). In the case of regionalization, the ability of participating communities to exercise home rule authority in order to enter into innovative regionalization agreements is suggested to be a common impact area among successful regionalization efforts. Therefore, operationalizing such an impact area involves measuring the degree to which participating governments possess home rule authority as a predominant institutional variable. The basis for measuring the variable’s action will be the absolute difference (presence of absence) of home rule authority among all regional participants.
Social impacts of regionalization have been shown to be primarily attributable to demographic homogeneity among citizens within the region (Saiger, 2009). Therefore, operationalizing social impact areas of regionalization entails measuring the degree to which citizens within the region possess the predominant social variable of demographic homogeneity. However, further operationalizing demographic homogeneity suggests several secondary measureable variables of interest, such as the degree to which citizens of the region possess similar income levels, educational levels, and racial backgrounds. The basis for measuring the effect of social variables will therefore be the numerical difference in percentage values between the predominant regional participant and the entire region.

The literature also suggests that differences in party affiliations among regional participants is the source of many of regionalization’s political impacts (Sorensen, 2006). When significant divides in political ideologies are present within communities, the resulting political disagreements often carry over into public policy functions and decision making. Trends in party affiliations are typically discoverable by analyzing historical voting trends. In this regard, operationalizing the political impact areas of regionalization involves measuring the degree to which citizens within the region support political candidates of various political party affiliations, and whether such support suggests that the region is politically unified. Voting patterns in presidential elections at the time of regionalization will be utilized as the basis for measuring political unity within each region examined.

**Data Acquisition**

The primary source of quantitative data will be statistics and facts compiled and catalogued by the United States Census Bureau. Especially with respect to data required to assign numerical values to demographic variables, publicly available census data will provide
reliable results. Other qualitative data will be gathered from a variety of sources as noted. Institutional data relative to the various governmental structures will be acquired from a combination of governmental websites and prior studies of the five communities discussed in the literature review section. Political data will be acquired either from governmental websites, or from organizations that specialize in compiling accurate voter and election data such as Politico.com and uselectionatlas.org.

**Data Analysis and Measurement**

The analytical and measurement processes will entail calculating data values for all variables (both numerical and qualitative findings) in accordance with the Sample Equation 1 above. The resulting values will then be assigned to the corresponding communities under study, and then summarized. The appropriate weights in accordance with the continuum model and sample equation will then be applied to all results in order to index the communities’ regionalization suitability in relation to the other subject communities. The numerical data collected for the social variables will be considered to suggest congruency/homogeneity if the high and low values for the region fall within a 20 percent tolerance range. With respect to regional political variables, 60 percent or greater support for a general election presidential candidate during the era when regionalization occurred will be considered regional political unity.

In order to confirm the correlational relationships between independent and dependent variables, a linear regression analysis will be conducted using Microsoft Excel ® data analysis tools. The regression analysis will identify the factors that most influence the dependent variable of regional suitability, and will assess the statistical significance of the data outputs in terms of their reliability in predicting the behavior of the dependent variable.
Reporting Results

Research results will be reported descriptively via both narrative and graphical representations. The initial raw data collected will be arranged into a tabular spreadsheet depicting the value of each variable with respect to the four subject cases. An additional spreadsheet will then be presented in order to display the calculated index values of the variables for each community, as well as the total community RSI value. Finally, following verification of the conceptual model via obtaining results that match actual conditions in the four communities studied, the methodology will be applied to the city of Youngstown’s regional conditions. Youngstown’s results will be displayed separately in a similar tabular fashion.

Quality Assurance/Quality Control Review

Piercey (2014) suggests that implementing a quality assurance-quality control (QA/QC) program is an important element of any research endeavor that involves the collection and management of data. Constructing a QA/QC process that is tailored to the nature of the specific research being conducted can greatly assist in eliminating errors related to precision and accuracy, and in minimizing possible bias attributable to an inconsistent application of assumptions during the course of the research.

QA/QC measures for the current research will generally consist of two aspects. First, it is necessary to assure that the data gathered and presented is responsive to the research question, and is representative of the manner in which the variables have been operationalized. Secondly, it is necessary to exercise considerable diligence to assure that data is accurately transferred from the source database to the data presentation tools and formats within the research paper. Therefore, the following QA/QC measures will be employed for this research:

- All data will be organized and presented in a manner that is straightforward and easily understandable.
• Sources of all data will be closely reviewed for accuracy and responsiveness to the research.
• All data entry functions will be checked to assure that data are correctly entered into tables.
• All mathematical formulas will be checked to assure consistent distribution of rounding errors.
• All mathematical calculations will be checked for accuracy.

Limitations

Notwithstanding the above described QA/QC process, it is likely that the research will still yield several limitations. The first is attributable to a relatively limited research scope. Data relative to the four communities studied and the eight total variables selected do not eliminate the possibility that data measuring other unconsidered institutional, social, and political variables may affect the four communities differently. Additionally, it is also possible that the eight variables selected may affect other communities not examined within the scope of the current research in a manner inconsistent with the findings.

Secondly, similar to most research designs having qualitative elements, assumptions have been made in order to measure some of the data in meaningful ways. With regard to the social data, congruency/homogeneity between the predominant community and the entire region in each case examined is assumed to be present if the respective data values are within a 20 percent range. This assumption was necessary since expecting to discover exact numerical similarities in demographic-related data among any two or more communities is impractical, and virtually impossible to achieve. Additionally, a presidential candidate’s attainment of 60 percent or greater of total regional votes is considered to represent regional political unity. This assumption is consistent with Thompson-Hill’s & Hill’s (2001) widely accepted definition of a presidential landslide victory.
Results

The findings of the research are reported in the following sections that coordinate with the ways in which the methodology proposed to measure relationships between the independent variables and the dependent variable of regionalization suitability. Independent variables in the institutional and social categories were found to have overall positive relationships with the dependent variable in each of the three communities analyzed. Somewhat surprisingly however, the independent variable in the political category was found to positively impact the dependent variable in only one community, with no impact in the three remaining communities. The data values per each category are arranged by community and presented in Table 2.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>COMMUNITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ALCOSAN</td>
</tr>
<tr>
<td></td>
<td>PITTSBURGH</td>
</tr>
<tr>
<td>INSTITUTIONAL CONGRUENCY</td>
<td>Home Rule</td>
</tr>
<tr>
<td>SOCIAL CONGRUENCY</td>
<td>Education (% w/4-year degree)</td>
</tr>
<tr>
<td></td>
<td>Minority Population (%)</td>
</tr>
<tr>
<td></td>
<td>MHI (Dollars)</td>
</tr>
<tr>
<td>POLITICAL UNITY</td>
<td>Party Affiliations (at time of regionalization)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 – Data Values for Independent Variables
Data Sources: * U.S. Census Bureau (2014); ** uselectionatlas.org (2016)

Institutional Congruency
The independent variable of institutional congruency in the form of home rule government accurately predicted the behavior of the dependent variable in all four communities. With the exception of several small boroughs, virtually all participants in the successfully regionalized Allegheny County Sanitary Authority (ALCOSAN) waste water system practice home rule governance. The near universality of home rule in this region is largely attributable to the presumptive manner in which Pennsylvania apportions power and authority to its local government units (Ooms & Tracewski, 2009). Except for small unincorporated areas, all government units within the Houston-Galveston regionalized wastewater system also operate under home rule authority (Texas State Historical Association, 2015). The independent variable of institutional congruency therefore accurately predicted regionalization suitability in this region as well. The independent variable of institutional congruency also predicted regionalization suitability in the case of the San Jose-Santa Clara regionalized wastewater system. Although not a widely selected option among local California governments, both entities in this case have previously adopted home rule charters (League of California Cities, 2016). In the case of the city of Pontiac, Michigan’s and Oakland County’s unsuccessful attempt to regionalize wastewater functions, only the City of Pontiac operates under home rule governance authority. All other entities operate under state statutory governance provisions. Therefore, the value of the independent variable in terms of the absence of institutional congruency accurately predicted a lack of regionalization suitability in this case as well.

As the basis for conducting a linear regression analysis, the statistical relationships in each region between the independent variable of home rule congruency in terms of universal or near universal adoption of home rule government, and the calculated RSI value for the region were identified. For analytical purposes, a numerical value of “1” was assigned to regions.
having universal home rule, and “0” to regions lacking home rule universality. These relationships for all regions examined are displayed in Table 3 below.

<table>
<thead>
<tr>
<th>REGION</th>
<th>Δ HOME RULE * (x)</th>
<th>RSI ** (y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PITTSBURGH-ALLEGHNY COUNTY</td>
<td>1</td>
<td>1.17</td>
</tr>
<tr>
<td>HOUSTON-GALVESTON COUNTY</td>
<td>1</td>
<td>1.00</td>
</tr>
<tr>
<td>SAN-JOSE-SANTA CLARA COUNTY</td>
<td>1</td>
<td>1.00</td>
</tr>
<tr>
<td>PONTIAC-OAKLAND COUNTY</td>
<td>0</td>
<td>0.00</td>
</tr>
</tbody>
</table>

* 1 = Home Rule Universality Within Region
0 = Lack of Home Rule Universality Within Region

** See Table 8, Pg. 52

Table 3– Relationships between Home Rule and RSI Values

Social Congruency

The independent variable of social congruency was operationalized through three separate conditions. All social demographic data through which the variables were measured was obtained from the United States Census Bureau (2014). The first social condition deals with congruent educational levels within the communities studied with respect to the percentage of residents in the major city versus the percentage in the entire region possessing four-year college degrees. As previously discussed within the methodology section, congruency was assumed present when data values between the predominant city participant and the entire region fell within a 20 percentage point tolerance range. The second social condition deals with minority population levels in the major city versus the entire region. As with the educational condition, racial congruency was assumed to exist when the value spread was equal to or less than 20 percentage points. The third social aspect deals with measuring the socioeconomic condition of Median Household Income (MHI). Congruency was assumed present when the absolute MHI
dollar values for the major city versus the entire region fell within a 20 percent tolerance range.

**Educational Variable**

In the ALCOSAN region, the educational variable accurately predicted successful wastewater regionalization, with 37.2 percent of Pittsburgh residents and 36.9 percent of Allegheny County residents earning four-year degrees. The educational variable also predicted the success of Houston-Galveston’s regionalized wastewater system. In the predominant city of Houston, 29.8 percent of residents possess four-year degrees, whereas in the entire Harris County region, 29.0 percent possess four-year degrees. In the San Jose-Santa Clara region, the educational variable impact, although still positive within the tolerance range, was less pronounced. While 47.3 percent of Santa Clara residents possess four-year degrees, only 38.2 percent of residents in the predominant city of San Jose have the same degree. In the Pontiac-Oakland County case, the educational variable also accurately predicted a lack of regionalization suitability. Clearly outside of the tolerance range, 43.7 percent of Oakland County residents and 11.0 percent of Pontiac city residents have four-year degrees.

The statistical relationships in each region between the independent variable of educational congruency in terms of percentage differences of people possessing a four-year college degree in the entire region versus the major city, and the calculated RSI value for the region were identified, and are presented in Table 4 below.
### Table 4 – Relationships between Education and RSI Values

<table>
<thead>
<tr>
<th>REGION</th>
<th>Δ 4-YEAR DEGREE (%) (x)</th>
<th>RSI ** (y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PITTSBURGH-ALLEGHENY COUNTY</td>
<td>0.30</td>
<td>1.17</td>
</tr>
<tr>
<td>HOUSTON-GALVESTON COUNTY</td>
<td>0.80</td>
<td>1.00</td>
</tr>
<tr>
<td>SAN-JOSE-SANTA CLARA COUNTY</td>
<td>9.10</td>
<td>1.00</td>
</tr>
<tr>
<td>PONTIAC-OAKLAND COUNTY</td>
<td>39.80</td>
<td>0.00</td>
</tr>
</tbody>
</table>

* See Table 2, Pg. 44  
** See Table 8, Pg. 52

### Racial Variable

In the ALCOSAN region, the racial variable failed to accurately predict regionalization suitability. The difference between the 26.1 percent Pittsburgh city and 13.2 percent Allegheny County minority population levels clearly falls outside of the 20 percent congruency tolerance range, even though ALCOSAN has been successful in its waste water regionalization efforts. In the Houston-Galveston region, the racial variable did accurately predict regionalization suitability. 23.7 percent of Houston residents versus 18.9 percent of Harris County residents belong to minority races. The racial variable also accurately predicted successful regionalization in the San Jose-Santa Clara Region. Both San Jose and Santa Clara have similar minority population levels, with San Jose at 36.1 percent, and Santa Clara at 35.9 percent of their total populations. The racial variable also accurately predicted a lack of regionalization suitability in the case of Pontiac and Oakland County, Michigan.

The statistical relationships in each region between the independent variable of racial congruency in terms of percentage differences of minority populations in the entire region versus the major city, and the calculated RSI value for the region were identified, and are presented in Table 5 below.
MHI Variable

The MHI variable accurately predicted regionalization outcomes in three of the four regions. In ALCOSAN, despite successful regionalization efforts, the relative difference in MHI values between Pittsburgh city and Allegheny County residents was 24 percent, just outside of the 20 percent tolerance range. The MHI variable was accurate in predicting successful regionalization in both Houston-Galveston and San Jose-Santa Clara regions. The relative difference between MHIs was 15 percent in the Houston-Galveston region, and 11 percent in the San Jose-Santa Clara region. The MHI variable also accurately predicted unsuccessful regionalization efforts in the Pontiac-Oakland County region. A difference of 58 percent between Pontiac city and Oakland County regional MHI’s is clearly outside of the 20 percent tolerance range, corresponding with an absence of regionalization suitability.

The statistical relationships in each region between the independent variable of MHI congruency in terms of actual dollar differences annual income in the entire region versus the major city, and the calculated RSI value for the region were identified, and are presented in Table 6 below.
### Table 6 – Relationships between MHI and RSI Values

<table>
<thead>
<tr>
<th>REGION</th>
<th>Δ MHI (DOLLARS) (x)*</th>
<th>RSI (y) **</th>
</tr>
</thead>
<tbody>
<tr>
<td>PITTSBURGH-ALLEGHENY COUNTY</td>
<td>12,381</td>
<td>1.17</td>
</tr>
<tr>
<td>HOUSTON-GALVESTON COUNTY</td>
<td>8,094</td>
<td>1.00</td>
</tr>
<tr>
<td>SAN-JOSE-SANTA CLARA COUNTY</td>
<td>10,067</td>
<td>1.00</td>
</tr>
<tr>
<td>PONTIAC-OAKLAND COUNTY</td>
<td>38,804</td>
<td>0.00</td>
</tr>
</tbody>
</table>

* See Table 2, Pg. 44  
** See Table 8, Pg. 52

### Political Unity

The independent variable of political unity within the region was operationalized through measuring the degree of similar political party affiliations within the region during the time at which wastewater regionalization was successfully implemented. The measurement scale was based on the percentage of support for Republican and Democrat candidates in the presidential election closest to the time of regionalization. Regional political unity was assumed to exist when voters in the region supported either a Democrat or a Republican presidential candidate at a rate of 60 percent or higher. As previously discussed in the methodology section, the 60 percent threshold value for political unity was selected based on its established identity as representing a landslide election victory (Thompson-Hill & Hill, 2001). All data for the political variable values were obtained from uselectionatlas.org, and verified through the secondary source of Politico.com. Both of these entities maintain historical databases of prior presidential election results by state and county. In all cases, the data between the two sources was almost identical. When slight differences were noted between the two sources, they were attributed to mathematical rounding errors, which produced no impacts on measurement or summarization of data in this research.
ALCOSAN’s initial regionalization occurred in 1964 (Allegheny County Sanitary Authority, 2016). Therefore the 1964 presidential election was used as a measurement basis. In this case, regionalization suitability was accurately predicted as the Democrat presidential candidate garnered 66 percent of the total votes in Allegheny County. The Houston-Galveston regionalization took place in 2000 (Houston-Galveston Area Council, 2009). The political variable failed to predict successful regionalization in this case as neither political party achieved 60 percent of the total vote in the 2000 presidential election. The San-Jose-Santa Clara regionalization was implemented in phases between 1975 and 1979 (City of San Jose, 2016). As such, voting results from the 1976 presidential election were used to measure political unity. The political variable also failed to predict successful regionalization in this case since neither party achieved the 60 percent rate of voter support. In the Pontiac-Oakland County Region, the political variable did accurately predict an absence of regionalization suitability. Since the most earnest regionalization discussions took place between 2007 and 2010, voting results from the 2008 presidential election were used as a measurement basis (URS Corporation, 2007). Neither party achieved the requisite 60 percent support rate in Oakland County.

The statistical relationships in each region between the independent variable of political unity in terms of political party preferences within the entire region versus the predominant city, and the calculated RSI value for the region were identified. For analytical purposes, a numerical value of “1” was assigned to regions where political unity was present, and “0” to regions where political unity was not present. These relationships for all regions examined are displayed in Table 7 below.
### Regional Suitability Index Calculations and Summarizations

Regional Suitability Indices (RSIs) were calculated for all regional communities in accordance with Sample Equation A as shown in the theoretical framework section. The model produced an accurate total RSI value in all four cases with respect to each community’s actual experience with wastewater regionalization. The weighted measurement results of the data, along with the calculated RSIs for each of the four communities studied are presented in Table 8.

<table>
<thead>
<tr>
<th>REGION</th>
<th>Δ POLITICAL UNITY (x)</th>
<th>RSI (y)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>PITTSBURGH-ALLEGHENY COUNTY</td>
<td>1</td>
<td>1.17</td>
</tr>
<tr>
<td>HOUSTON-GALVESTON COUNTY</td>
<td>0</td>
<td>1.00</td>
</tr>
<tr>
<td>SAN-JOSE-SANTA CLARA COUNTY</td>
<td>0</td>
<td>1.00</td>
</tr>
<tr>
<td>PONTIAC-OAKLAND COUNTY</td>
<td>0</td>
<td>0.00</td>
</tr>
</tbody>
</table>

* 1 = Political Unity Within Region
0 = Lack of Political Unity Within Region

** See Table 8, Pg. 52

### Table 7 – Relationships between Political Unity and RSI Values

### Table 8 – Calculated Regional Suitability Index Values for Selected Communities
RSI values for ALCOSAN, Houston-Galveston, and San Jose-Santa Clara all fell within the suitability range in accordance with the evaluative continuum model (Figure 5; p.35). The RSI value of 0.0 for Pontiac, MI fell outside of the suitability range, consistent with the lack of success the community experienced in its regionalization attempts. In all cases, the calculated RSI accurately reflects the communities’ true experience with wastewater regionalization in terms of success or lack of success.

The institutional variable of home rule governance, as the strongest predictor of regionalization suitability, produced an RSI sub-total reflective of the actual regionalization outcome in all four cases. Cumulatively, the RSI subtotal for social variables also accurately reflected each communities’ actual regionalization experience. Individually, however, the minority population and MHI sub-categories only produced accurate RSI sub-totals in three of the four cases. The political variable component of the RSI only predicted accurate regionalization outcomes in two of the four communities.

**Regression Analysis**

Thus far, the RSI model developed through the use of the regionalization evaluative continuum has been the sole predictor of each community’s suitability for regionalization of wastewater services. Absent further statistical analysis, however, the RSI model relies upon a presumption that the discovered relationships among variables as displayed in Tables 4 through 7 are based on statistically significant data. In order to affirm such a presumption, it is necessary to employ additional analytical techniques capable of validating the presumed correlation between the selected independent variables, and the dependent variable of regional suitability. One such generally accepted technique is referred to as *regression*. The following regression analysis (Table 9) evaluates the RSI model’s correlational strength (in terms of Pearson’s “R” value), its
statistical significance (in terms of p value), and how well the model fits the data (in terms of $R^2$ value).

<table>
<thead>
<tr>
<th>VARIABLE CLASS</th>
<th>PEARSON’S &quot;R&quot;</th>
<th>R²</th>
<th>p VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>INSTITUTIONAL VARIABLE</td>
<td>0.989</td>
<td>0.978</td>
<td>0.011</td>
</tr>
<tr>
<td>EDUCATIONAL VARIABLE</td>
<td>0.983</td>
<td>0.966</td>
<td>0.017</td>
</tr>
<tr>
<td>MINORITY VARIABLE</td>
<td>0.982</td>
<td>0.964</td>
<td>0.018</td>
</tr>
<tr>
<td>MHI VARIABLE</td>
<td>0.965</td>
<td>0.932</td>
<td>0.035</td>
</tr>
<tr>
<td>POLITICAL VARIABLE</td>
<td>0.471</td>
<td>0.222</td>
<td>0.529</td>
</tr>
</tbody>
</table>

Table 9 – Regression Analysis – Calculated through the use of Microsoft Excel ® data analysis tool

The regression analysis reveals that the institutional, educational, minority, and MHI variables display strong positive correlation to the dependent variable in terms of Pearson’s “R” (wherein 1 = totally positive; -1 = totally negative; and 0 = no correlation). Conversely, the political variable displays a relatively weak correlational relationship with an R value of 0.471. Similarly, the four variables with strong correlation also display $R^2$ values approaching 1.0, suggesting that the model adequately accounts for variability among the data. Once again, the political variable’s 0.222 $R^2$ value suggests that the model does not adequately account for variability among the data related to political unity. The regression analysis also reveals that data related to the institutional, educational, minority, and MHI variables contribute to the model in a statistically significant manner (wherein $p < 0.05$ = statistical significance). Data related to political unity are not statistically significant, having a p value of 0.529.

Application of the RSI Model to Youngstown’s Conditions
Since the RSI model was found to be an accurate overall predictor of regionalization suitability in each of the four cases studied, it was utilized to suggest the likelihood of successfully regionalizing wastewater facilities in Youngstown and surrounding communities within the Mahoning County watershed. Through the use of an identical evaluative methodology, Table 4 below displays data values for all independent variables, and summarizes Youngstown’s sub-total and total RSI values.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>YOUNGSTOWN REGION</th>
<th>DATA VALUES AND INDEX CALCULATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YOUNGSTOWN</td>
<td>MAHONING COUNTY</td>
</tr>
<tr>
<td>INSTITUTIONAL</td>
<td></td>
<td>RSI CALCULATION</td>
</tr>
<tr>
<td>Home Rule</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>RSI sub-total:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOCIAl</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education (% w/4-year degree)</td>
<td>11.5 *</td>
<td>21.5 *</td>
</tr>
<tr>
<td>Minority Population (%)</td>
<td>45.2 *</td>
<td>15.7 *</td>
</tr>
<tr>
<td>MHI (Dollars)</td>
<td>24,361 *</td>
<td>41,350 *</td>
</tr>
<tr>
<td>RSI sub-total:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RSI TOTAL:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POLITICAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Party Affiliations</td>
<td>YES (2012)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>63% - D **</td>
<td>0.5/1 = 0.50</td>
</tr>
<tr>
<td></td>
<td>35% - D **</td>
<td></td>
</tr>
<tr>
<td>RSI Sub-Total:</td>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>RSI TOTAL:</td>
<td></td>
<td>0.512</td>
</tr>
</tbody>
</table>

*U.S. Census Bureau (2014); **uselectionatlas.org (2016)

Pursuant to Ohio’s Constitution, only cities are granted the option to select local home rule authority. Therefore, the institutional variable fails to predict regionalization suitability since Youngstown is the only community within the Mahoning county region to possess such authority.
Only one of the three social variables suggests congruency among prospective regional participants. The educational variable predicts regionalization suitability, while the racial and MHI variables predict an absence of regional suitability. The political variable of political unity also predicts regional suitability. Utilizing data from the 2012 presidential election, 63% of Mahoning county voters supported the Democrat candidate.

In view of the independent variable data, the model indicates that Youngstown has a total RSI value of 0.512. Of the three variable categories, only the political variable was a strong predictor of regional suitability. When Youngstown’s total RSI value is plotted on the evaluative continuum scale, it is well outside of the suitability range (Figure 7). Therefore, the research finds that Youngstown and its surrounding communities are not optimally suited to be participants in a regionalized wastewater system.
Discussion/Conclusion

The following discussion section will identify the some of the recognizable implications of the research with respect to the three previously stated hypotheses, and then evaluate whether those implications sufficiently answer the central research question. The discussion will also consider whether the research findings arrived at through the theoretical lens of Kaufman’s (2010) evaluative continuum are supported by the literature previously examined. Finally, based on the interpretations set forth, possible directions for future research in regard to regionalization decision making in local government settings will be offered.

Hypothesis 1

*High congruency among the institutional variable of governmental structures between predominant participant(s) and the entire region predicts optimal regionalization suitability.*

The data presented strongly support the claim made in Hypothesis 1 that high institutional congruency among regional participants is a predictor of regional suitability. In all four cases examined, the institutional variable of home rule government correctly predicted the outcome of regionalization efforts when measured on the continuum scale. It was therefore not surprising that regionalization was unsuccessful in the Pontiac, Michigan region where home rule government is virtually non-existent. Support for Hypothesis 1 is further strengthened in light of the strong positive correlation noted in the ALCOSAN regionalization case where home rule local government structure has been in effect for many years, and is a virtual mandate pursuant to Pennsylvania law.

Strong support for Hypothesis 1 is also generally consistent with the research examined. Especially notable is the nexus between Osborne’s & Gabler’s (1992) Reinventing Government movement, and regionalization as an innovative means toward producing more efficient and effective government. By its nature, innovation requires the abandonment of orthodoxy, and the
exercise of free thinking and acting. In cases where government structure restricts or prohibits freedom in favor of convention, regionalization was less successful. Conversely, in cases where the presence of home rule authority facilitates innovation, regionalization was found to be more successful. The results-oriented regionalization philosophy is also consistent with what Pouder (1996) identified as Reinventing Government’s contemporary outcome-based performance objectives. Under the regionalization perspective, reducing costs is no longer synonymous with fewer services. Instead, regionalization proponents claim that it promotes cost saving and service improvement by transforming the institutional underpinnings of the participating organizations.

**Hypothesis 2**

*High congruency among social variables of income levels, educational backgrounds, and racial backgrounds between residents of predominant participant(s) and residents of the entire region predict optimal regionalization suitability.*

When measured on the continuum scale, data for the three selected social variables generally support Hypothesis 2, with one perplexing exception. In three of the four cases, data universally support the correlation between social congruency and regionalization suitability. In the case of ALCOSAN, however, two of the three social variables failed to accurately predict the community’s successful regionalization outcome. At least part of this failure may be attributable to significantly different demographic identities today versus when regionalization was first implemented in 1964. The inability of the variables to accurately predict ALCOSAN’s successful regionalization outcome therefore suggests that if regionalization efforts were initiated today, the outcome in the ALCOSAN region may very well be quite different than it was in 1964.

The varied strength of the selected social variables in predicting regionalization suitability in many respects reflects the conflicting nature of literature regarding the social costs
and benefits of regionalization within communities. McAndrews & Voith (1993) extoll the virtues of regionalization in that it creates more resourceful communities with lower service costs. From a differing perspective, however, Saiger (2009) contends that regionalism promotes a state of social confusion by interfering with the natural process through which people decide where to live. Under such a theory, regionalization is viewed as obfuscating the socioeconomic advantages of more affluent regional participants, while artificially enhancing the identities of less prosperous ones. ALCOSAN seems to be capable of falling prey to such an argument, since the data suggest there are significant social demographic variances between the core city of Pittsburgh and the outlying regional community as a whole.

**Hypothesis 3**

*High congruency among the political variable of political party unity within the entire region predicts optimal regionalization suitability.*

Support for Hypothesis 3 is weak since the political variable of party unity was the least successful in predicting regionalization suitability. Similarly, the regression analysis revealed that data related to political unity did not have a strong correlational relationship to regional suitability. It is therefore not surprising that counter to Sorensen’s (2006) assertion that diverse political ideologies within a region tend to discouraging consensus policymaking, the communities of Houston-Galveston and San Jose-Santa Clara were able to successfully regionalize wastewater services despite such diversity. The deep divide in political party support in the two regions during the presidential elections preceding regionalization implementation suggests that both citizens and policymakers were able to eclipse their ideological differences in order to realize the region-wide benefits of service consolidation. The lack of political unity in the Pontiac, Michigan region that predicted the environment’s unsuitability for regionalization is therefore not particularly significant.
When viewed in an isolated manner, the inconsistent relationships between data values for the political variable and the communities’ overall regionalization suitability also lend credence to Maher’s (2015) contention that decisions concerning regionalization often lack rationality. Maher suggests that one source of such rationality is politicians’ strong desire to favor certain special interests, regardless of facts and prevailing public opinions. When the effects of the political variable are viewed in concert with the impacts of institutional and social variables that contribute to the communities’ overall RSI, however, the argument concerning irrational decision making is dispelled to a large extent.

**Theoretical Implications**

The overall consistency between the calculated RSI values, the regression analysis, and the communities’ actual regionalization experiences suggests that the Kaufman’s (2010) evaluative continuum was effective in assigning numerical values to the ways in which the mixture of quantitative and qualitative data were comingled. In all cases, the final RSI values determined by the continuum scale agreed with overall actual regionalization outcomes. The reliance on a continuum as a means to measure data that lacks homogeneity is further supported by Luce & Narens (1987). They suggest that when the effects of two or more variable are combined to create an effect on an external variable, conflicting units of measurements become irrelevant in favor of the creation of a ratio scale which remains consistently proportioned throughout the linear continuum spectrum.

**Implications for Youngstown**

In accepting that the research establishes accurate methods of gathering, presenting, and measuring data that suggest regionalization suitability, it is clear that in the near term, Youngstown should look elsewhere for ways to make its wastewater operations more affordable
and sustainable. The absence of uniform home rule authority throughout the region will remain as a significant barrier unless Ohio law makes the option available to unincorporated communities. The disparate values of social variables, especially minority populations and median household income levels throughout the region also present formidable and enduring challenges absent a miraculous turnaround in the domicile decision making process of various social class members. One bright spot on the regionalization horizon for Youngstown, however, is the existence of region-wide political unity. Although found to be a weaker and less significant indicator of regional suitability, data suggest that Youngstown voters decidedly espouse a Democrat party ideology. Unfortunately, the research confirms that political unity alone is insufficient to place Youngstown within or even in close proximity to the suitable regionalization range.

In a general sense, the Youngstown region’s disaffection for regionalization originates from a condition that also afflicts many other communities when faced with difficult decisions: The inability to propose problem solutions that make sense to people from a wide range of viewpoints. In Youngstown’s case, a relatively poor inner-city population would likely favor wastewater regionalization for its economic benefits. Residents in more affluent outlying communities with higher incomes and more resources, however, are likely willing to pay more for such services in order to avoid becoming a partner in Youngstown’s economic lament and its perceived inferior social identity.

The research initially posed the following question:

*How can a regional approach to providing local public services be successfully implemented in a manner that achieves political, social, and institutional acceptability,*
while providing citizens of Youngstown and surrounding communities with optimally efficient and effective levels of wastewater services?

The research results have found that answering such a question is a complex proposition. The answer requires government leaders to discover innovative ways to level the playing field among regional participants in order to make regionalization a more universally attractive option. The research suggests that in the Youngstown region, several actions are necessary prerequisites to regionalization. First, the city of Youngstown needs to become more like its regional neighbors in a social sense, so that much like Houston-Galveston or San Jose-Santa Clara, a united identity emerges. Secondly, Youngstown’s political leaders should lobby state legislators to carefully examine the ill-effects that overarching and centralized regulatory control impose on local government’s ability to make decisions that meet their individual and often widely varying needs. Finally, public policy arising from political decision making throughout the region needs to maintain rationality despite the temptations to serve the most powerful or influential at the expense of those who need government’s help the most. Unfortunately, the day when such utopian ideals become the basis for action may be a long way off for Youngstown and many other local communities across the nation.

Recommendations for Future Research

The current research has introduced several possible paths for future research efforts. Initially, it is important to remember that the current research establishes correlational relationships among relatively broad impact areas. It also establishes a method for measuring the relative strengths of such relationships. Accordingly, a foundational basis has been put forth for generally assessing multiple factors capable of affecting whether regionalization is a suitable alternative for a particular region. The research does not, however, investigate why such
relationships exist, what specific actions are required to manipulate the relationship strengths, or whether there may be additional factors that impact regional suitability. Future research may therefore rely upon the established foundational methodology to test whether other factors may also affect regionalization, or whether varying combinations of factors positively or negatively impact regional suitability.

In addition, regional suitability may be viewed by some researchers as merely one symptom of government’s generalized lack of focus on attainment of the common good. In many respects, government’s primary concern currently centers on maintaining the status quo for most citizens at the expense of those who can most benefit from change. Therefore, social scientists may view the discovered institutional, social, and political relationships as a means to propose new theories about how government and its citizens may be encouraged to interact in more positive ways.
References


Red Oak Consulting (2009); City of Youngstown Sewer Rate Study. Available at: City of Youngstown Department of Public Works, 26 S. Phelps Street, Youngstown, OH, 44503


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