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ANALYSIS OF FACTORS CONTRIBUTING TO EARLY ADOPTION OF MULTI-

MUNICIPAL COMPREHENSIVE PLANS IN PENNSYLVANIA

A Thesis

Submitted to the McAnulty College and Graduate School of Liberal Arts

Duquesne University

In partial fulfillment of the requirements for

the degree of Master of Arts in Social and Public Policy

By

Karen Vanderhoff

August 2015

ANALYSIS OF FACTORS CONTRIBUTING TO EARLY ADOPTION OF MULTI-

MUNICIPAL COMPREHENSIVE PLANS IN PENNSYLVANIA

By

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ABSTRACT

ANALYSIS OF FACTORS CONTRIBUTING TO EARLY ADOPTION OF MULTI-

MUNICIPAL COMPREHENSIVE PLANS IN PENNSYLVANIA

By

Karen Vanderhoff

August 2015

Thesis supervised by Dr. Michael Irwin, Ph.D.

On the cusp of entering the 21st century, after decades of unchecked development of available land which exceedingly outpaced population growth, Pennsylvania was facing an impending land crisis. In a statewide response to reduce sprawl and preserve land, the Pennsylvania legislature passed Act 67 and Act 68, amending the Pennsylvania Municipal Planning Code. These amendments gave more power and tools to municipalities for developing multi-municipal comprehensive plans with neighboring municipalities. In this study, I use logistic regression to examine whether there are commonalties among municipalities which have developed multi-municipal comprehensive plans following the passage of Acts 67 and 68. My research shows that municipalities that have previously developed a municipal comprehensive plan and municipalities with a planning commission are more likely to participate in the development of multi-municipal plans.

ACKNOWLEDGEMENT

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INTRODUCTION AND STATEMENT OF PROBLEM

        Local municipal governments across the United States historically have had authority to

plan and regulate land use, and this is particularly true for Pennsylvania, which has 2,570

separate municipalities. The autonomy of municipalities relies heavily on their ability to regulate

land uses because it enables them to "shape the character of their built environment, control

socioeconomic composition, maintain their tax bases and ensure their ability to deliver quality

goods and services" (Christensen and Levinsen 2003:835). However, in circumstances such as

land use development, a municipality that focuses solely on its own particular interests may

inadvertently cause negative ripple effects that affect the larger region. Municipalities

traditionally develop plans and make decisions that solve or advance local concerns without

consideration of the regional impact, thus transferring negative impacts onto neighboring

communities (Attkinson 2009:981). Development decisions in one municipality may adversely

affect the traffic patterns, natural resources, water supply and sewage systems, and many other

aspects of neighboring municipalities (Paulsen and Wilson 2008:2). As a result, it is important

for Pennsylvania to employ policies that encourage municipalities to plan regionally rather than

locally.

        On the cusp of entering the 21st century, after decades of unchecked development of

available land which exceedingly outpaced population growth, Pennsylvania was facing an

impending land crisis. Between 1960 and 1990, the population in the ten largest metropolitan

areas grew by only 13% while the development of land grew by a staggering 80% (Pennsylvania

21st Century Environmental Commission 1998:2). In 1997, Pennsylvania's Governor Tom Ridge declared sprawl to be the number one environmental problem affecting the Commonwealth (Pa. Executive Order 1997-4) and appointed the 21st Century Environmental Commission to provide policy recommendations.

The Commission, a panel of forty cabinet members, legislators, business leaders, environmentalists and planners (Pa Executive Order 1997-4), submitted their final report in September 1998. The principal recommendation was to promote responsible land use, which included a proposed amendment to the Pennsylvania Municipal Planning Code (PMPC) to allow for "county/multi-municipal cooperation to develop regional plans through the use of intergovernmental cooperative agreements" (21st Century Environmental Commission 1998:22).

In 1999, Governor Thomas Ridge issued an executive order that specified growth and land use as the primary environmental concerns in Pennsylvania. Joel P. Dennison writes of this order as including "preservation of farmland and open space, encouragement of regional cooperation among local governments, protection of private property rights and encouragement of development in areas most able to accommodate growth" (2001:385).   In order to further encourage intergovernmental cooperation amongst municipalities, Gov. Ridge signed legislation to amend the existing PMPC, Acts 67 and 68, under the umbrella of the "Pennsylvania Growing Greener" initiative. These acts gave municipalities the voluntary option to compose land use plans in partnership with neighboring municipalities while keeping the autonomy of remaining separate municipalities and the legal foundation to encourage intergovernmental cooperative planning in Pennsylvania.

It is now approaching 15 years since the passage of the Pennsylvania Municipal Planning Code amendments. This research intends to identify factors that increase the likelihood of

municipalities taking advantage of the legislative changes. For these acts to be a successful policy initiative, it will be advantageous to explain what factors encouraged early adoption of multi-municipal comprehensive plans. By assessing what variables play a larger role in encouraging intergovernmental cooperation, local governments and planners will be better prepared to approach future multi-municipal planning efforts.

 RATIONALE

The aim of this research is to assist future municipalities and agencies in developing multi-municipal comprehensive plans. An additional aim of this research is to help officials at the state level adequately deliver resources and funding to assist communities with regional planning. Each municipality in Pennsylvania will have its own unique combination of factors that will either enable or hinder the process of engaging in inter-municipal cooperation. This research will identify what municipalities are more likely to be successful in undertaking a multi-municipal plan today and what municipalities will require additional time and support.

RESEARCH QUESTION AND HYPOTHESIS

This study analyzes demographical and geographical characteristics of individual Pennsylvania municipalities. It has been established that through the adoption of Acts 67 and 68 to the Municipal Planning Code there has been a significant increase in inter-governmental cooperation among municipalities. With this research, I plan to identify which key factors may influence the move from autonomous planning to joint planning and the successful development of multi-municipal comprehensive plans in Pennsylvania.

The primary hypothesis is that the development of multi-municipal comprehensive plans is more likely to occur in municipalities that have a history of past planning efforts. Specifically, I hypothesize that municipalities that have previously adopted municipal comprehensive plans are more likely to develop a multi-municipal comprehensive plan. The first supplementary hypothesis predicts that there will also be a higher occurrence of multi-municipal comprehensive plans among municipalities that have greater access to planning tools. This hypotheses is measured by the existence of a planning commission. My second supplementary hypothesis predicts that municipalities with a history of addressing regional issues and concerns will have a higher occurrence of multi-municipal plans. This hypothesis is measured by the municipalities' being a member of a council of government or cooperative. The final supplementary hypothesis is that municipalities located along a major transit corridor have a higher degree of interconnectivity than other municipalities and are therefore more likely to address planning regionally by adopting a multi-municipal plan. This hypothesis is measured by whether the municipality is located within one or five miles of highway and interstate access.

DEFINITIONS

The Comprehensive Plan

A comprehensive plan is a "statement of policy and intent about the future growth and development of the community. It is a plan primarily for the physical development of the community, and it is concerned with land use, transportation, public facilities, infrastructure, natural and environmental resources, housing, socioeconomic issues, economic development and fiscal aspects of community growth and change" (Duerksen, Dale and Elliot 2009:38).

Act 2000-68 states that a comprehensive plan, municipal, multi-municipal or county, must include, but is not limited to:

1) A statement of objectives of the municipality concerning its future development, including but not limited to, the location, character and timing of future development.

2) Plan for land use, which may include provisions for the amount, intensity, character and timing of land use proposed for residence, industry, business, agriculture, major traffic, and transit facilities, utilities, community facilities, public grounds, parks and recreation, preservation of prime agricultural lands, flood plains and other areas of special hazards and other similar uses.

3) Plan to meet housing needs of present residents and of those individuals and families anticipated to reside in the municipality, those individuals and families anticipated to reside in the municipality, which may include conservation of presently sound housing, rehabilitation of housing in declining neighborhoods, and the accommodation of expected new housing in different dwelling types and at appropriate densities for households of all income levels.

4) A plan for the movement of people and goods, which may include expressways, highways, local street systems, public transit routes, terminals, airfields, port facilities, and other similar facilities and uses.

5) A plan for community facilities and utilities, which may include public and private education, recreation, municipal buildings, fire and police stations, libraries hospitals, water supply and distribution, sewage and waste treatment,

solid waste management, storm drainage and flood plain management, utility

corridors and associated facilities , and other similar facilities or uses.

6) A statement of the interrelationship of the individual components of the overall

plan, which may include an estimate of the environmental, energy conservation,

fiscal, economic development and social consequences on the municipality

7) A discussion of the short term and long term implementation strategies, which

may include implications for capital improvements programming, new or updated

development regulations and identification of public funds potentially available.

8) Explanation of how the overall plan is consistent with neighboring municipalities

9) A plan for the protection of natural and historic sources, including but not limited

what is mandated through Federal or State law (Pennsylvania Act 2000-68:

Section 301)

The Multi-Municipal Comprehensive Plan

According to Pennsylvania Act 2000-67, a multi-municipal plan is "a plan developed and

adopted by any number of contiguous municipalities, including a joint municipal plan as

authorized by this act" (Section 107).

THE DEVELOPMENT OF LAND USE PLANNING AND ZONING IN THE UNITED

STATES

Land use planning in the United States can be traced back to the beginning years of the

country. Early examples include the establishment of the District of Columbia outside the

jurisdiction of any state; the physical planning of the Erie Canal, which connected the Atlantic

Ocean and the Great Lakes, forming an essential commerce route; and the Homestead Act of 1862, which outlined the settlement of the western United States (Becker and Kelly 2000:24). By the 1780's, the national coordinate survey system was a uniform guide for property management and a solution to property disputes over vague descriptions in land titles. This system utilized the longitude and latitude grid to lay out property lines and establish the acre as a standard measure of land (Becker and Kelly 2000:25).

While early planning efforts were largely at the national level, the establishment of planning as a responsibility of local governments can be attributed to the City Beautiful Movement of the late 1800's (Duerksen et al 2009:4). The City Beautiful Movement strove to combine practical planning and aesthetically pleasing design – a mix of function and beauty. Prior to this movement, aesthetics did not play a role in land development, as "aesthetics simply was not thought of as a function of local government" (Duerksen et al 2009:4). Following the Civil War, as economic strength and domestic pride grew, city plans began to showcase their grandiose potential. A definitive example, which captures the spirit of the City Beautiful Movement, was Daniel Burnham and Frederick Law Olmsted's "White City," which was revealed at the Chicago World's fair of 1893. The "White City," located along Chicago's lakefront, highlighted classical architecture and luxurious buildings. Duerksen et al states that "beautiful cities don't just happen; they require plans and then rules to encourage private buildings to fit into the pattern, and so the modern planning profession was born (2009:4).

During the same time, as cities continued to grow in size, the managers of local government were forced to deal with growing public health concerns. Detailed planning was necessary in order to make the colonial-era cities inhabitable and sanitary by adding modern water and sewage systems. As automobile use increased, planners devised ways to

accommodate the traffic by adding additional roadways and widening the existing roadways (Duerksen et al 2009:5-6). Public health and well-being are still a primary concern of the planning profession today, as local governments are responsible for planning for emergency services, plumbing, electricity, housing and other community facilities.

In 1916, the city of New York adopted the first comprehensive zoning laws. Before that time, private property rights of the land owner held priority and therefore the courts settled land disputes using public nuisance laws (Attkinson 2009:984-985). As the United States continued to grow, the use of public nuisance laws began to congest the courts. As a result, more and more cities enacted zoning regulations to gain control over how land was being developed. The United States Supreme Court, in 1926, set a constitutional precedent in Euclid v. Ambler Realty Co. by upholding "that comprehensive zoning is constitutional so long as it has a substantial relationship to the health, safety, morals or general welfare of the public" (Attkinson 2009:986). Furthermore, the Court stated that "zoning regulation must be arbitrary and unreasonable to be overturned" (Attkinson 2009:986). In the same ruling, the Supreme Court also concluded that municipalities need not consider other municipalities when drafting zoning regulations; a municipality is "politically separate, with powers of its own and authority to govern itself as it sees fit" (Attkinson 2009:986). This ruling placed planning and zoning decisions squarely in the hands of local governments and gave local governments permission to disregard their neighboring municipalities in the decision-making process.

Also in 1926, the United States Department of Commerce instituted the Standard State Zoning Enabling Act (SZEA). SZAE was designed to provide local governments a nationwide standard for zoning practices. The SZEA is consistent with the Supreme Court's findings, wherein zoning decisions fall under the authority of local governments as long as the zoning

supports the general welfare of the communities (Attkinson 2009:987). The passage of SZEA further strengthened the role of local governments in deciding land use and zoning regulations.

An additional requirement outlined in the SZEA was that any land use regulation must be "in accordance with a comprehensive plan" (Attkinson 2009:991). This provision protected the rights of the land owners against "arbitrary zoning decisions, facilitates consistency in the promulgation and enforcement of land use laws, and gives the landowners ability to predict and rely on particular zoning regulations" (Attkinson 2009:991). What the SZEA failed to do, however, was to define what constituted a comprehensive plan or any course of action the municipality must undergo in preparation of the plan. Therefore, disputing land use decisions made by the municipality was difficult in a court of law. The federal government addressed this oversight with the passage of the Standard City Planning Enabling Act (SCPEA) in 1928. The SCPEA clearly defined the comprehensive plan; however, it was not without its own flaws, as it directly contradicted the SZEA by making comprehensive plans voluntary (Attkinson 2009:990). The consequence of the voluntary clause written into the act was that municipalities did not actively pursue future planning activities and instead continued to focus on reactive planning that solved or advanced only local concerns without consideration of the impact made regionally (Attkinson 2009:990).

Modern-day planning practices can be traced to the Housing Act of 1954 (Fasic, Lembeck and Kelsey 2001:5). Prompted by the growth of the highway system and suburban development, there was an increase in the necessity for planning efforts. The Housing Act of 1954 created the "701" program to subsidize planning by local governments. Federal funding through the 701 or similar programs continued through the 1970's, but has virtually ceased

since the 1980's. Today, most planning initiatives are driven by state and municipal

governments. (Becker and Kelly 2000:47-48).

PENNSYLVANIA'S CHALLENGES LEADING UP TO THE 2000 AMENDMENTS

Sprawl

In 1997, Governor Tom Ridge created the 21st Century Environmental Commission to

review Pennsylvania's treatment of land and the environment and to make recommendations for

the future. The resulting report outlined more than 240 specific recommendations. Of those

recommendations, the first and foremost is to deter the threat that increasing sprawl has on

Pennsylvania's environment, economy and general well-being.

What is sprawl? Sprawl is defined as the consumption of undeveloped land which

exceeds the growth of the population (Attkison 2009:980, Gillham 2002:3). Sprawl does not

mirror the traditional American neighborhood, wherein there are mixed use developments which

place residential needs all within walking distance (Attkinson 2009:980-981). Instead, sprawl

communities are characterized by low density, single-use development, such as residential

subdivisions, office parks or large shopping centers that are automobile dependent (Attkinsin

2009:982, Gillham 2002:4-7). Pennsylvania's 21st Century Environmental Commission defined

sprawl as:

> Sprawl is the reckless, almost random growth of housing developments, strip
> malls, business parks, and the roads connecting them, and the number of vehicles
> using these roads. Sprawl wastes open land, damages habitat and natural
> diversity, and destroys historic sites. It strains public funds to build the roads and
> sewers and schools that must spread to serve a spreading population (1998:2).

Sprawl is not a new phenomenon; its beginnings can be traced back to the end of World

War II (Duany et al 2000:7). In the latter half of the 1940s, the Veterans Administration and the

Federal Housing Administration developed low cost mortgage programs for newly built homes located on the periphery of the city. During the same timeframe, the Federal government invested in the development of 41,000 miles of new interstate highways, connecting the connecting the urban core with the suburbs (Duany et al 2000:8). In building these new communities, city planners indorsed single-use zoning restrictions to keep residential, commercial and industrial development separate from one another (Duany et al 2000:9), creating the fragmented community structure that still exists today.

In Pennsylvania, sprawl is growing at a staggering pace. Between 1960 and 1990 the population in the ten largest metropolitan areas grew by only 13%, but the developed land across the state grew by an astounding 80% (21st Century Environmental Commission 1998:2). There is patchwork development across much of Pennsylvania, where the vast countryside has traditionally been home to scattered municipalities due to its agricultural background (21st Century Environmental Commission 1998:16). As the population grew and expanded from the metropolitan cores, highway and interstate systems were built that could service high levels of automobile traffic (Gillham 2002:12). The existing local roadways were unable to support the increased demand and consequently new development was built circumventing previously established towns and villages. This is a common trait of sprawl, known as leapfrog development. Leapfrog development when development occurs in clusters around forests or farmland, resulting in "a haphazard patchwork, widely spread apart and seeming to consume far more land than continuous development" (Gillham 2002:4).

According to the findings of the 21st Century Environmental Commission, sprawl is specifically causing negative economic, social and environmental impacts that are harming the

overall quality of life in Pennsylvania (21st Century Environmental Commission 1998:17-20,

Denworth 2002:2-6).

Economic Impacts

    With sprawl comes an enormous economic cost. A study by the Real Estate Research

Corporation determined that total investment to build a high-density community is "21 percent

below the cost of a combination mix community and 44 percent below the cost of a low density

sprawl community" (1974:3). See figure 1. Much of the savings in cost can be attributed to

lower residential construction costs and, to a slightly lesser extent, lower costs on infrastructure

such as roads and sewers lines (Real Estate Research Corporation 1974:4).
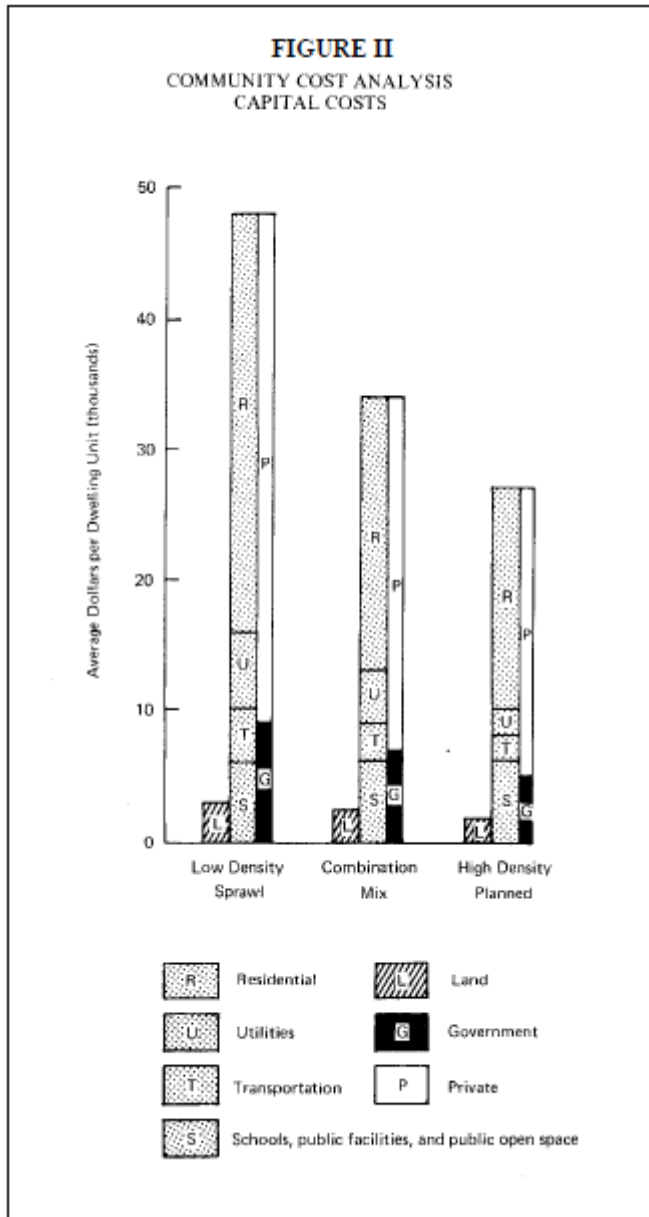
Figure 1. Community Cost Analysis: Capital Costs (Real Estate Research Corporation 1974:3).

As population spreads from developed areas into under- or undeveloped areas, the economic pressure on the under- or undeveloped areas is quite high. Public facilities, such as roads, sewers, water supply and wastewater treatment systems, have to be built or improved to serve the population (21st Century Environmental Commission 1998:19). In the long run, the cost of maintaining infrastructure across a larger area also more costly (Gillham 2002:123).

These needed investments result in larger costs for municipalities and are typically met by increased taxes (21st Century Environmental Commission 1998:19).

Social Impacts

As previously discussed, sprawl is the spread of a population over larger areas of land; the growth of developed land exceeding the growth of the population. A large percentage of the population shift is people (upper- and middle-income residents) moving from urban centers to suburban and rural communities. This shift results in an "unintended social stratification for Pennsylvania [which] concentrates poor and minority populations in urban areas with limited access to jobs or schools that provide quality education (21st Century Environmental Commission 1998:20).

The separation of the inner-city poor and the suburban/rural middle and upper classes was further heightened in the 1960's and 1970's, when new highways were built to create better access between the suburbs and downtown urban centers. Most often, these highways were constructed on inexpensive land that, correspondingly, housed poor residents. The streets in communities that were once pedestrian- and business-friendly were widened and altered to accommodate the increase of traffic from commuters, essentially destroying communities in their wake (Duany et al 2000:87). The same highways built for commuter traffic also gave corporations and businesses the opportunity to relocate outside of the city, taking jobs, now only accessible by automobile, along with them. The 21st Century Environmental Commission summarized the situation here in Pennsylvania as:

> The majority of [a metropolitan] region's urban populations live or soon will be living in municipalities where tax bases are low and service costs high and where social burdens are comparatively heavy – children in the free lunch program, single-parent households, low median property values and high crime levels. The

affluent may (and do) depart – literally, for greener pastures – but the problems remain (or worsen) and the resources available to meet those problems shrink (1998:20).

Environmental Impacts

Sprawl produces negative effects on the environment by encroaching on open space and marring the natural landscape with housing and business developments. The encroachment on open space also destroys viable farmland. Pennsylvania lost over one million acres of farmland between the years 1982 and 1992 alone (21st Century Environmental Commission 1998:18).

Another result of sprawl is the loss of aquifers. Aquifers are the "geographic layers that hold our groundwater resources and, during period of little rain, determine the water flow in streams and rivers" (21st Century Environmental Commission 1998:18). Loss of these water reserves puts a strain on the aquatic life in our streams and rivers and decreases the amount of water available for public consumption.

Stormwater runoff with the resulting water pollution and flooding is yet another negative effect sprawl has on the environment. When stormwater hits an impervious surface such as streets and parking lots the water is quickly funneled into streams and sewer systems. Automotive waste and other man-made pollutants are carried along with the water and are mixed into the water systems (natural and man-made). The water also has the potential to overwhelm streams and sewer systems, leading to flooding downstream of development (21st Century Environmental Commission 1998:18).

Automobile emission are one of the major sources of air pollution. As people spread farther apart from one another, there is an increase in the amount of time spent traveling from one place to another, particularly in automobiles. The total number of miles driven per day in Pennsylvania increased 12% between the years 1990 and 1996. The resulting emissions decrease

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overall air quality (21st Century Environmental Commission 1998:19). Another major source of air pollution is home heating. Higher-density communities, as opposed to a sprawling, low-density community on average require less energy to heat (Real Estate Research Corporation 1974:4).

Governmental Organization

The Commonwealth of Pennsylvania is one of only four states founded as a Commonwealth. This standing establishes that the government's primary objective is to serve and protect the "common good." The structure of Pennsylvania's government begins with the state and then is divided into nine classes of counties (67 in total). However, in order to live up to its standing as a commonwealth and be diligently aware of the needs of its citizens, much of the government work is directed to local governments. The local units of governments in Pennsylvania are four classes of cities, two classes of townships, towns and boroughs, neither divided into classes (Pennsylvania Department of Community and Economic Development 2001:1).

Local municipalities are not under the authority of the U.S. national government; power and authority are delegated directly by the Commonwealth. Prior to 1972, local municipalities did not have the intrinsic right to self-govern beyond what was explicitly granted to them through the state constitution. However, after the passage of the Home Rule Charter and Optional Plans Law of 1972, municipalities where given the option to choose both their own governmental structure and what services to be responsible for (Alderfer 1966:34).

The result is that Pennsylvania's governmental structure can be compared to a "marble cake—so mixed and inter-related are their activities" (Alderfer 1966:34). The diversity in governmental structures makes coordinating land use a difficult endeavor. In addition, the 2,570

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municipalities, 67 counties, over 500 school districts and a multitude of additional organizations and districts making consistency among land-use decisions across Pennsylvania extremely difficult to obtain (Denworth 2002:v). Ultimately, the fragmentation discourages planning cooperatively and the result is "excessive localism…. as each municipality pursues its own interests through zoning and land use controls, the aggregate effects on the region may be undesirable" (Paulson and Wilson 2008:1).

Municipalities in Pennsylvania do have the option to merge with their neighbors, creating a brand new municipality. This option, however, is not popular. Since 1991 only twelve mergers have taken place and sixteen consolidation attempts were denied by voters (Gazarik 2013). According to Pennsylvania law, municipalities are not allow to dissolve and force a merger with a neighboring municipality, instead any merger must be voter approved. Voter approval is often difficult to get. The voters in municipalities which are merging with a larger municipality, often fear the loss of community identification, while voters in the larger municipalities are averse to taking on the debt of the smaller municipality (Gazarik 2013). The best available alternative then is to increase joint cooperation and sharing of services.

PENNSYVANIA'S RESPONSE TO THE PROBLEM OF SPRAWL

Pennsylvania's response to the problem of sprawl was to make it easier for municipalities to develop land use plans jointly. On June 22, 2000, Governor Tom Ridge signed the "Growing Smarter" initiative, under the umbrella of "Pennsylvania Growing Greener," which included the Act 67 and 68 amendments to the PMPC. With this action, the Governor declared that Pennsylvania would change its approach to land use planning and encourage regional partnerships in order to decrease the negative impacts of out-of-control sprawl (Levine 2001). More specifically, within Article XI: Intergovernmental Cooperative Planning and

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Implementation Agreements, the legislation gave "new powers and incentives to Pennsylvania's [2,570] local governments to use intergovernmental cooperative agreements to develop and implement multi-municipal plans with their neighbors" (Denworth 2002: i).

The ability to create a multi-municipal plans was not a new concept, as it had previously been an option in the PMPC. However, the amendments altered the requirement that each cooperating municipality adopt a joint zoning ordinance. With that stipulation removed, municipalities entering into a multi-municipal plan are allowed to retain individual zoning ordinances as long the zoning ordinances are consistent with the multi-municipal plan (Paulson and Wilson 2008:2). Municipalities received the advantage of cooperative planning without sacrificing local control.

Pennsylvania, by encouraging municipal cooperation and regional planning, is able to specifically address concerns raised by the 21st Century Environmental Commission's final report.

Economically

Competition among Pennsylvania's many municipalities for tax revenue, coupled with the poor planning and often destructive patterns of sprawl, has left the Pennsylvania landscape littered with an overabundance of highway-oriented shopping and office centers and deteriorating downtown centers (Denworth 2002:2, Paulson and Wilson 2008:2). The Pennsylvania Municipal Planning Code amendments of Acts 67 and 68 allow for municipalities implementing a multi-municipal plan to designate growth areas within their region. Article XI, section 1104 Implementation Agreements, parts (a) and (c) state:

> (a) In order to implement multi-municipal comprehensive plans, under section 1103 counties and municipalities shall have authority to enter into intergovernmental cooperative agreements.

(c) Cooperative implementation agreements may designate growth areas, future growth areas and rural resource areas within the plan. The agreement shall also provide a process for amending the multi-municipal comprehensive plan and redefining the designated growth area, future growth area and rural resource area within the plan (Pennsylvania Municipal Planning Code 2005: 91-92).

By identifying designated growth areas, municipalities cooperating together can target development and public investment in areas that will be both economically viable and sustainable (Denworth 2002:2-4). The cooperating municipalities are authorized under article XI, section 619 of the Pennsylvania Municipal Planning Code to set up, upon agreement, shared tax revenue so that municipalities that accept the burden of less revenue-generating land uses (such as affordable housing or preservation of farmland) are able to "receive compensation in the form of revenue from neighboring municipalities whose tax bases are growing" (Paulson and Wilson 2008:2).

Another tool now available for municipalities to use in planning is the transfer of development rights. In Article XI, Section 1105(b)(1): Transfer of Development Rights, municipalities that have entered into a multi-municipal plan have the authority "to adopt a transfer of development rights program by adoption of an ordinance applicable to the region of the plan so as to enable development rights to be transferred from rural resource areas in any municipality within the plan to designated growth areas in any municipality within the plan" (Pennsylvania Municipal Planning Code 2005:92). The transfer of development rights is beneficial because it allows the owners of land selected to be preserved (for example— agricultural or forested land) to sell their development rights at the market rate of the land to be developed (Denworth 2002:9). Development can then be targeted to a chosen area that is more desirable. Before the amendments, municipalities were only authorized to transfer development

rights within the municipal borders. Now, greater areas of land can be considered when

determining where land should be preserved and where development should occur.

Additionally, Article XI, section 1106 allows "municipalities cooperating in a multi-

municipal plan to develop a specific plan for an area designated for commercial, industrial or

other nonresidential development and to develop one set of regulations for that area (Denworth

2002:10). Specific plans can regulate such things as design or sewer, water and drainage,

building heights, property set-backs or road access as long as the regulations are in compliance

with the multi-municipal plan.

Environmentally

In *Planning beyond Boundaries*, Joanne Denworth states that "natural resources do not

respect political boundaries" (2002:4). Multi-municipal cooperation can aid in protecting the

natural resources that cross multi-municipal borders, such as streams, watersheds, forests,

aquifers and farmland. These resources can be collectively managed when multiple

municipalities work together on conservation action plans, by developing greenway designations,

connecting parks and trails, or other conservation-related efforts.

As much of the funding for large-scale conservation efforts comes from state agencies

such as the Department of Environmental Protection (DEP) and the Department of Conservation

and Natural Resources (DCNR), article XI, section 1105 was added to the Pennsylvania

Municipal Planning Code in support of multi-municipal cooperation:

> (2) State agencies shall consider and may rely upon comprehensive plans and
> zoning ordinances when reviewing applications for the funding or permitting of
> infrastructure or facilities.

> (3) State agencies shall consider and may give priority consideration to
> applications for financial or technical assistance for projects consistent with the
> county or multi-municipal plan (2005:93).

Article XI, section 619.2(j) of the Pennsylvania Municipal Planning Code further adds that departments within the Commonwealth "shall consider and may rely upon comprehensive plans and zoning ordinances when reviewing applications for the funding or permitting of infrastructure or facilities" (2005:55). If neighboring municipalities are not consistent in their plans for the environment, state agencies now have the power to not only deny funding but also to deny permits when a conflict exists between local land use plans or zoning ordinances.

Legally

Until the legislative changes of 2000, the Pennsylvania Municipal Planning Code still required that each municipality that chooses to have zoning must provide for "all legitimate uses or be subject to a substantive validity challenge" (Levine 2001:27). Acts 67 and 68 allow for municipalities that adopt a multi-municipal plan to share the land uses across the area of the plan. The multi-municipal plan will thus have area-wide significance in areas such as transportation, utilities and conservation and also have the flexibility to plan in order to retain the urban, suburban or rural character of each municipality. Legally, the amendments provide protection from any challenges to the validity of zoning ordinances enacted as a result of the plan.

VARIABLE CONCEPTUALIZATION

The purpose of this study is to identify which key factors may influence a municipality to move from autonomous planning to joint planning and the successful development of multi-municipal comprehensive plans in Pennsylvania. The hypothesis in this study is that municipalities that have a history of past planning will be more likely to enter into a multi-municipal plan. It also predicted that municipalities with greater access to planning tools, addressing regional concerns, or located along a major transit route are also more likely to enter in to a multi-municipal plan.

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History of Past Planning

The adoption of a municipal or a multi-municipal comprehensive plan is not mandated by the Pennsylvania Municipal Planning Code and is therefore done so only on a voluntary basis (21st Century Environmental Commission 1998:20; Denworth 2002:1). Municipalities that make the decision to develop land use plans have taken proactive measures to ensure their community has a blueprint for future growth. In this study, I predict that municipalities that have voluntarily planned in the past show more willingness to plan than municipalities with no history of planning. Also municipalities with a history of planning are more educated on the process of creating a comprehensive plan. For this study, a municipality's history with past planning is measured by whether or not the municipality has its own comprehensive plan. Due to the similarities of expectations in both municipal and multi-municipal comprehensive plans, as set out in the Pennsylvania Municipal Planning Code, the development of a local municipal plan may provide a framework for intergovernmental cooperation.

Access to Planning Tools

For this study, access to planning tools was measured by whether or not the municipality had a planning commission. The 21st Century Environmental Commission identified that the understanding of land use patterns and education in planning is "critical to the process of developing the enlightened policies at every level of government that can undo the errors of the past" (1998:22). Municipalities are in a better position to plan if they have experienced professionals to guide the municipality through the process of planning. Experienced professionals also give the municipality a greater understanding of the reasons for creating a comprehensive plan. Municipalities with a planning commission have established that planning

is a priority and would have the knowledge and tools to participate in the multi-municipal planning process.

History of Addressing Regional Concerns

The process of developing a multi-municipal plan is shifting the municipality from concentrating solely on local concerns, to thinking about land use on a regional level. I predict that municipalities that have previously cooperated with neighboring municipalities have built relationships that would likely improve chances of participation in a multi-municipal plan. For this study, two variables establish a history of addressing regional concerns: if the municipality is a member of a Council of Governments (COGs) and if the municipality is a member of a Cooperative.

Location along a Major Transit Route

Municipalities located near a major transit corridor may have a higher degree of interconnectivity than other municipalities, as there is typically an increased amount of development taking place along corridors. Interstate systems were originally built as communities grew beyond the metropolitan cities. The systems were planned to reduce fragmentation and increase connectivity of regions to one another (Dreier 2004:221). It is likely that these municipalities would have therefore been at the forefront of regional planning as the transit corridors were built. This history should make it likely for the municipalities to work together to create regional plans because one municipality's development decisions has a greater chance of affecting the surrounding municipalities. For this study, two variable were used to determine proximity to a major transit route: if a municipality is located within one mile of an interstate and if the municipality is located within five miles of an interstate.

Secondary Variables

Also included in this study are additional variables where data was available at the municipal level. These variables are not identified in the literature as being linked with land use planning, but were included to investigate if there is in fact a connection. These variables are:

1. Population and size. Population is measured by the municipalities' 2000 population and 2000 population density. Size is measured by the square mileage of the municipality.

2. Income variability. Income variability is measured by four variables: percent of families below the poverty level, percent of households with income below $25,000 (low income), percent of households with incomes between $25,000 and $99,999 (middle income) and the percent of households with income $100,00 and above (high income)

3. Educational attainment. Educational attainment is measured by the percent of municipal population with a high school diploma or under, percent of municipal population with some college to a bachelor's degree and percent of municipal population with a graduate or professional degree.

4. Age. Age is measured by the percent of municipal population between the ages of 20 and 44 (prime adulthood), percent of municipal population between the ages of 45 and 64 (middle age) and percent of municipal population 65 and older (retirement age).

5. Housing. Property value, occupancy and property age. Property value is measured by percent of properties with a value of $99,999 and under, percent of properties with a value between $100,000 and $199,999, percent of properties with a value between $200,000 and $299,999 and percent of properties with a value of $300,000 and above. Occupancy is measured by percent of properties that are owner occupied, the percent of properties that are renter occupied and the percent of properties that are vacant. Property

age is measured by the percent of properties built in 1939 or earlier, the percent of properties that were built between 1940 and 1969, percent of properties built between 1970 and 1999 and the percent of properties built in 2000 or later.

6. Employment. Employment is measured by the percent of municipal population in the labor force, the percent of municipal population that is employed and the median travel time to work.

7. Gender. Gender is measured by the percent of municipal population that is male.

8. Race. Race is measured by the percent of municipal population that is white.

VARIABLE OPERATIONALIZATION

The data used for this thesis is limited to the Commonwealth of Pennsylvania. It consists of data from the 2007-2011 American Community Survey, 2000 U.S. Census, Department of Community and Economic Development's Municipal Statistics, Local Government Academy's e-library, Pennsylvania Department of Transportation, Pennsylvania Department of Economic Development and the Pennsylvania Association of Councils of Government.

History of Past Planning

The source of data for this variable was the Governor's Center for Local Government Service's (GCLGS) ELibrary. The GLCGS Elibrary is an electronic database that displays county and municipal land-use documents for the State of Pennsylvania. The variable is coded as dichotomous variable: 0= municipality does not have a comprehensive plan, and 1= municipality has a comprehensive plan. The variable is measured positively if a municipality has adopted a comprehensive plan at any point in time. By 2010, 67% of municipalities had a comprehensive plan.

Access to Planning Tools

Data on planning commissions came from the Department of Community and Economic Development's Municipal Statistics. The variable is coded as dichotomous variable: 0= municipality does not have a planning commission, and 1= municipality has a planning commission. 66% of municipalities reported that they have an active planning commission (n = 2533).

History of Addressing Regional Concerns

Data concerning COGs and Cooperatives came from an August 2007 publication by the Governor's Center for Local Government Services, "Directory of Pennsylvania Councils of Government." Both variables are coded as dichotomous variables: 0= municipality is not reported being a member of a COGs/Cooperative, and 1= municipality is reported being a member of a COGs/Cooperative. 41% of municipalities reported being a member of a COGs, while 9% of municipalities reported being a member of a Cooperative (n = 2525).

Location along a Major Transit Route

These variables identify municipalities that have or do not have a boundary along a major interstate in Pennsylvania. The interstates used are I-70, I-76, I-78, I-79, I-80, I-83, I-89, I-99, I-276, I-380, and I-476. Major transit corridors were identified using a GIS map layer obtained from the Pennsylvania Geospatial Data Clearinghouse. The map layer, entitled PENNDOT-Pennsylvania State Roads 200910, originated from the Pennsylvania Department of Transportation, Department of Planning and Research, Geographic Information Division. This map layer displays all "State-owned and maintained public roads within Pennsylvania as extracted from the PENNDOT Roadway Management System (RMS); includes fields describing pavement type, traffic volumes and other information" (Penn State University 2009).

Municipalities located along major transit corridors were identified using GIS. Municipalities

located within one mile and five miles were selected by location and clipped out, creating a new

map layer.

Both variables are coded as dichotomous variables: 0=on a major corridor and 1=on a

major corridor. 25% of municipalities are within one mile of an interstate. 49% of municipalities

are within five miles of an interstate.

Each of the hypothesis variables are answered with either a yes or a no. The tables below

display the frequencies of yes/no for each of the variables. Missing data were cases in which a

yes or a no was unknown.

Table 1. Frequencies for SINGLE-MUNICIPAL PLAN.

	Frequency	**Percent**
NO	842	33.3
YES	1682	66.6
Total	2525	100.0

Table 2. Frequencies for PLANNING COMMISSION.

	Frequency	**Percent**
NO	850	33.7
YES	1674	66.3
MISSING	1	0.0
Total	2525	100.0

Table 3. Frequencies for COUNCIL OF GOVERNMENT.

	Frequency	Percent
NO	1498	59.3
YES	1027	40.7
Total	2525	100.0

Table 4. Frequencies for COOPERATIVE.

	Frequency	Percent
NO	2297	91.0
YES	228	9.0
Total	2525	100.0

Table 5. Frequencies for INTERSTATE WITHIN ONE MILE.

	Frequency	Percent
NO	1887	74.7
YES	636	25.2
MISSING	2	0.1
Total	2525	100.0

Table 6. Frequencies for INTERSTATE WITHIN FIVE MILES.

	Frequency	Percent
NO	1283	50.8
YES	1242	49.2
Total	2525	100.0

Population and Size Variables

Municipal population in 2000: This variable is used to determine if population size affects multi-municipal planning. Specifically, will a group of municipalities with small populations be more inclined to plan jointly and share services or planning costs? The data for municipal populations was obtained from the 2000 U.S. Census data, available through Penn State's Pennsylvania State Data Center. An examination of descriptive statistics for population discovered that the data was extremely negatively skewed (Skewness = 44.066). According to Pallant, skewness "provides an indication of the symmetry of the distribution" (2011:56). For municipal population, the negative skew shows that a large number of municipalities have a small population. As large cities are substantially different in their approach to planning than smaller municipalities (Fasic, Lembeck and Kelsey 2001:6), it was decided to remove municipalities with a population over 60,000. The removal of those municipalities significantly decreased the negative skew. A second reason municipalities with population over 60,000 were removed from the sample was the impact outliers have on the logistic regression model. The presence of outliers, in this cases municipal populations that are substantially larger than the mean population, will result in the regression model having a poor fit (Tabachnick and Fidell 2001:523).

The municipalities removed were Philadelphia, Pittsburgh, Allentown, Erie, Upper Darby Township, Reading and Scranton. After a second examination of the descriptive statistics, the skewness was greatly reduced (skewness = 4.27). According to Tabachnick and Fidell (2001:523), the logistic regression model does not require the predictors to be normally distributed and therefore was left as is.

The mean population of the remaining municipalities (n = 2525) is 3907 with a standard deviation of 6144.

Population Density: Population density was calculated in SPSS as the number of people living per square mile in each municipality. Population density is included as a possible predictor variable because it is plays a determining factor for planners in where to concentrate future development, transportation improvement, schools and services. There is an average of 1353 people per square mile in the 2525 municipalities.

Square miles: This variable emphasizes the amount of strain these small municipalities face in order to provide for "residence, industry, business, agriculture, major traffic and transit facilities, utilities, community facilities, public grounds, parks and recreation, preservation of prime agricultural lands, flood plains and other areas of special hazards and other similar uses (PMPC 12)" as recommended in the PMPC. The source of this data was the Department of Community and Economic Development's Municipal Statistics. The average municipality size is 17.6 square miles, with a standard deviation of 19.7.

Table 7. Descriptive Statistics of POPULATION AND SIZE Variables.

Variable	N	Minimum	Maximum	Mean	Standard Deviation
Population (2000)	2525	24	59850	3907.30	6143.50
Population Density (2000)	2525	.46	120200	1353	3279.94
Square Mileage	2525	.10	193.9	17.63	19.72

Income Variables

Percentage of families below the poverty level: The purpose of this variable is to examine if there is a link between very low income and a municipality's joint planning efforts. Does a high concentration of families living below the poverty level reflect the municipality's health and growth potential? Will these municipalities be more inclined to plan jointly and share services or planning costs with neighboring municipalities? This variable was sourced from the 2007 – 2011 American Communities Survey.

There were six municipalities with over 40% of the population in families below the poverty level. Logistic regression is very sensitive to the presence of outliers, as they to cause the model to have a poor fit. The cases removed from the sample were Braddock Borough, Jeddo Borough, Clarksville Borough, Rankin Borough, Grugan Township and Shade Gap Borough. Once removed, an average of 7.71% of the population in each municipality lived in families below the poverty level.

Annual household income: Data on household income came from the 2007 – 2011 American Community Survey. These variables were used to examine if income levels affect a municipality's joint planning efforts. Municipalities with a larger percentage of wealthier residents would receive higher revenues from property taxes and, as a consequence, need not rely on partnership with neighboring communities. The original variables were: percent of income under $10,000, percent of income $10,000 - $14,999, percent of income $15,000 - $24,999, percent of income $25,000 - $34,999, percent of income $35,000 - $49,999, percent of income $50,000 - $74,999, percent of income $75,000 - $99,999, percent of income $100,000 - $149,999, percent of income $150,000 - $199,999, and percent of income $200,00 and above. These variable were collapsed to create three new values: low income (percent of income under

$25,000), middle income (percent of income $25,000 - $99,999) and high income (percent of income $100,000 and above).

Low Income: One outlier was identified in the descriptive statistic and removed, Ohiopyle Borough. With the outlier removed, an average of 23.1% of the population of each municipality (n = 2525) fall into the low income category.

Middle Income: Five outliers were identified in the descriptive statistics and removed, Centralia Borough, Fox Chapel Borough, Pleasant Valley Township, Cold Spring Township and Valley Hi Borough. With the outliers removed, an average of 23.1% of the population of each municipality (n = 2525) fall into the middle income category.

High Income: Four outliers were identified in the descriptive statistics and removed, Upper Uwchlan Township, Fox Chapel Borough, Birmingham Borough, Cold Spring Township and Centralia Borough. With the outliers removed, an average of 16% of the population of each municipality (n = 2525) fall into the high income category.

Table 8. Descriptive Statistics of INCOME Variables.

Variable	n	Minimum	Maximum	Mean	Standard Deviation
Family below Poverty Level	2525	0	38	7.72	6.13
Low Income (Under 25,000)	2525	0	69.8	23.06	9.82
Middle Income (25,000-99,999)	2525	22.4	87.7	61.06	8.65
High Income (Above 100,000)	2525	0	71.9	15.89	11.42

Educational Attainment Variables

These variables were used to determine if different levels of educational attainment have any influence on the planning initiatives of the municipality. These variables measure the highest level of educational completed and are reported as percentage of municipal population. The data for these variables was sourced from the 2007-2011 American Community Survey. The original variables were: percent below 9th grade, percent with 9th grade to 12th grade education, percent with a high school diploma, percent with some college, percent with an associate's degree, percent with a bachelor's degree and percent with a graduate or professional degree. These variables were collapsed to create three new values: percent with a high school diploma and under, percent with some college to bachelor's degree and percent with a graduate or professional degree.

Percent with a high school diploma and under: An average of 57.7% of the population of each municipality (n = 2525) have received a high school diploma or less.

Percent with some college to bachelor's degree: Seven outliers were identified in the descriptive statistics and removed: Valley Hi Borough, West Keating Township, Driftwood Borough, Green Hills Borough, Cold Spring Township and Centralia Borough. With the outliers removed, an average of 35.6% of the population of each municipality (n = 2525) have completed some college or a bachelor's degree.

Percent with a graduate or professional degree: One (1) outlier was identified in the descriptive statistics and removed: Swarthmore Borough. With Swarthmore removed from the sample there is an average of 6.7% of the population of each municipality (n = 2525) have completed some college or a bachelor's degree.

Table 9. Descriptive Statistics of EDUCATIONAL ATTAINMENT Variables.

Variable	*n*	Minimum	Maximum	Mean	Standard Deviation
High School Diploma and Under	2525	5.9	94.3	57.59	13.59
Some College to Bachelors	2525	5.7	70.9	35.6	9.29
Graduate or Professional Degree	2525	0	48.2	6.72	5.79

Age Variables

These variables were used to determine if different concentrations of age groups have any influence on joint planning initiatives of the municipality. Data relating to age was sourced from the 2007-2011 American Communities Survey. Age is divided into three variables: percent of municipal population between the ages of 20 and 44 (prime adulthood), percent of municipal population between the ages of 45 and 64 (middle age) and percent of municipal population 65 and older (retirement age).

An average of 29.15% of the population of each municipality (n = 2525) are between the ages of 20 and 44. An average of 29.83% of the population of each municipality (n = 2525) are between the ages of 20 and 44. An average of 16.95% of the population of each municipality (n = 2525) are between the ages of 20 and 44.

Table 10. Descriptive Statistics of AGE Variables.

Variable	*n*	Minimum	Maximum	Mean	Standard Deviation
Prime Adulthood (20 - 44)	2525	0	63.4	29.15	5.46
Middle Age (45 - 64)	2525	7.5	73.6	29.83	5.68
Retirement Age (65 and above)	2525	1.2	92.5	16.96	5.72

Housing Variables

Property value: As with the income variable, these variables were used to examine if property values affect a municipality's joint planning efforts, as there is a direct correlation between property values and income levels. These variables were sourced from the 2007-2011 American Communities Survey. Property value was originally divided into nine variables: median property value, percent of property value $50,000 and under, percent of property value $50,000 - $99,999, percent of property value $100,000 - $149,999, percent of property value $150,000 – 199,999, percent of property value $200,000 – 299,999, percent of property value $300,000 - $499,999, percent of property value $500,000 – 999,999 and percent of property value $1,000,000 and above. The variables were collapsed into five variables: median property value, percent of property value $99,999 and under, percent of property value $100,000 – 199,999, percent of property value $200,000 – 299,999 and percent of property value $300,000 and above.

Median Property Value: One outlier was identified and removed from the sample: Sewickly Heights Borough. With Sewickly Height removed from the sample the average medium property value of each municipality (n = 2525) is $144,635.76.

An average of 37.99% of the properties in each municipality (n = 2525) are $99,999 or under. An average of 34.95% of the properties in each municipality (n = 2525) are between $100,000 and $199,999. An average of 15.03% of the properties in each municipality (n = 2525) are between $200,000 and $299,999. An average of 37.99% of the properties in each municipality (n = 2525) are $99,999 or under.

Occupancy status: These variables measure the percentage of homes within a municipality that are owner-occupied, rented, or vacant. The purpose of these variables are to determine if occupancy status has any influence on the joint planning initiatives of the municipality. The source for these variables was the 2007 – 2011 American Communities Survey. Occupancy status is divided into three variables: percent owner-occupied, percent renter-occupied and percent vacant.

An average of 78.33% of the properties in each municipality (n = 2525) are occupied by the home owner. Two outliers were identified and removed from percent renter occupied: Seven Springs Borough and New Morgan Borough. With the outliers removed, an average of 21.7% of the properties in each municipality (n = 2525) are occupied by a renter. An average of 14% of the properties in each municipality (n = 2525) are not occupied.

Property age: These variables measure what percentage of each municipality's housing stock was built within a certain date range. The variables were used to determine if the age of the housing stock in different concentrations has any influence on joint planning initiatives of the municipality. The data was sourced from the 2007 – 2011 American Communities Survey. Property age is dived into four variables: percent of homes built 1939 and earlier, percent of homes built between 1940 and 1969, percent of homes built between 1970 and 1999 and percent of homes built in 2000 and later.

An average of 31.1% of the properties in each municipality (n = 2525) were built in 1939 or earlier. An average of 25.7% of the properties in each municipality (n = 2525) were built between 1940 and 1969. An average of 35.7% of the properties in each municipality (n = 2525) were built between 1970 and 1999. One outlier was identified and removed from percent of homes built in 2000 or later, Green Hills Borough (70.60). With Green Hills removed, an average of 7.5% of the properties in each municipality (n = 2525) were built in 2000 or later.

Table 11. Descriptive Statistics of HOUSING Variables.

Variable	*n*	Minimum	Maximum	Mean	Standard Deviation
Owner Occupied	2525	30.2	100	78.33	12.62
Renter Occupied	2525	0	69.8	21.67	12.62
Vacant	2525	0	96.5	13.96	14.82
Median Property Value	2525	28300	673300	144635.76	78512.3
Property Value Under 99,999	2525	0	100	37.99	25.28
Property Value 100,000 to 199,999	2525	0	86.7	34.95	15.31
Property Value 200,000 to 299,999	2525	0	65.3	15.03	12.7
Property Value 300,000 or Above	2525	0	96.4	12.03	16.33
Home Built 2000 or later	2525	0	47.9	7.53	6.81
Home Built 1970 to 1999	2525	0	85.2	35.67	16.08
Home Built 1940 to 1969	2525	0	92.9	25.73	12.34
Home Built 1939 or earlier	2525	0	89	31.07	17.6

Employment Variables

In labor force: This variable measures the percent of the municipal population that is at least sixteen years old and in the labor force. The purpose of this variable is to determine if

percentage of the population in the labor force has any influence on the joint planning initiatives of the municipality. This variable was sourced from the 2007 – 2011 American Communities Survey. According to U.S. Census, persons considered not in the labor force consist primarily of "students, homemakers, retired workers, seasonal workers interviewed in an off season who were not looking for work, institutionalized people, and people doing only incidental unpaid family work (less than 15 hours during the reference week) (U.S. Census Bureau 2000). Three outliers were identified and removed: Seven Springs Borough, Valley Hi Borough and Centralia Borough. With the outliers removed, an average of 62.4% of the population in each municipality (n = 2525) are in the labor force.

Employment rate: This variable measures the percent of municipal population that are at least sixteen (16) years old and are employed. This variable was sourced from the 2007 – 2011 American Communities Survey. The purpose of this variable is to determine if employment rates have any influence on the joint planning initiatives of the municipality. An average of 57.9% of the population in each municipality (n = 2525) are in the labor force.

Mean travel time to work: This variable measures the total amount of time it usually takes for an individual to get from home to work. This variable was sourced from the 2007 – 2011 American Communities Survey. Municipalities with high average travel times indicates that a large percentage of the employed population travel outside the area to work. Does this create an interconnectivity among the municipalities that encourages intergovernmental cooperation and planning? The average time traveled to work is 26.08 minutes in each municipality (n = 2517) are in the labor force.

Table 12. Descriptive Statistics of EMPLOYMENT Variables.

Variable	*N*	Minimum	Maximum	Mean	Standard Deviation
In Labor Force	2525	7.4	89.8	62.39	8.37
Employed	2525	7.4	82.8	57.85	8.44
Median Travel Time to Work	2517	11.8	63.3	26.08	5.82

Gender and Race Variables

Gender: This variables measures the percent of males in each municipality. This variable was sourced from the 2007 – 2011 American Communities Survey. An average of 49.6% of the population in each municipality (n = 2525) are male.

Race: This variable measures the percent of people identified as Caucasian in each municipality. This variable was sourced from the 2007 – 2011 American Communities Survey. An average of 96% of the population in each municipality (n = 2525) are male.

Table 13. Descriptive Statistics of GENDER and RACE Variables.

Variable	*N*	Minimum	Maximum	Mean	Standard Deviation
Sex (percent male)	2525	30.2	88.7	49.597	4.167
Race (percent white)	2525	9.1	100	95.988	7.841

Dependent Variable - Development of a Multi-Municipal Plan

As established in Acts 67 and 68, intergovernmental cooperation begins with the development and adoption of a multi-municipal comprehensive plan. The list of completed multi-municipal plans was compiled and made available by the Local Government Academy (LGA). LGA's data lists all plans and participating municipalities beginning after the legislative changes made by Acts 67 and 68 in 2000 through 2010. There are 175 plans included in this study, in which a total of 673 municipalities participated.

The variable is measured positively if a municipality is in the process of developing or has completed a multi-municipal comprehensive plan. By 2010, 27% of the 2525 municipalities were part of a multi-municipal plan.

Table 14. Frequencies for MULTI-MUNICIPAL PLAN.

	Frequency	Percent
NO	1854	73.4
YES	671	26.6
Total	2525	100.0

RESEARCH DESIGN

This study was performed using the statistical technique of logistic regression. Logistic regression was chosen because the dependent variable, successful development of a multi-municipal comprehensive plan, is a dichotomous variable that is answered with either a yes or no (coded "0" for no and "1" for yes), and the independent variables are a mix of dichotomous, discrete and continuous variables (Tabachnick and Fidell 517). The logistic regression model, in the simplest terms, emphasizes the probability that a variable will fall into a certain category (Parris 2011). In this study, I am using logistic regression to determine which of my dependent

variables will increase the probability that a municipality will develop a multi-municipal comprehensive plan.

The population of this study consists of 2525 of the 2570 municipalities (cities, boroughs and townships) in the Commonwealth of Pennsylvania. A total of 45 municipalities were removed from this study due to assumptions required to perform the logistic regression model – sample size, multicollinearity and outliers (Pallant 2011). Additional cases were removed if there was missing data in three or more of the demographic categories. The municipalities with missing data are Seven Springs Borough, Adamstown Borough, S.N.P.J Borough and Osborne (municipality class unknown).

MODEL DESIGN

I used logistic regression analysis for this study for three reasons. One, logistic regression is used when the dependent variable is a categorical dichotomous variable. The dependent variable is if a municipality has or has not adopted a multi-municipal plan. The second reason logistic regression was chosen for this study is that it "allows you to test models to predict categorical outcomes with two or more categories … predictor variables can be either categorical, continuous or a mix of both in the one model (Pallant 2007:166). The independent variables used in this study are a mix of categorical and continuous variables. Finally, logistic regression was used due to its flexibility. Unlike other analyses, "logistic regression has no assumptions about the distributions of the predictor variables; in logistic regression, the predictors do not have to be normally distributed, linearly related, or of equal variance in each group" (Tabachnick and Fidell 2001:517). Upon initial review of the descriptive variables

included in this study, there are many that are not normally distributed, making logistic regression a good fit for the data.

As with any statistical analysis, logistic regression has a set of assumptions the data should not violate. If the assumptions are violated, the regression analysis can generate inaccurate results. The first assumption of logistic regression is a large sample size. 2525 of the 2570 municipalities in Pennsylvania were used as the sample for this study.

The second assumption of logistic regression is multicollinearity. Multicollinerity means that the variables are highly correlated. If all the variables were placed into the regression, I would most certainly have multicollinerity, as many of the variables are continuous variables that are related (Pallant 2007:175). In order to avoid any complication such as that, I ran each variable through the regression separately and moved forward using only the variables which showed any predictability for my dependent variable –adoption of a multi-municipal plan.

The third and final assumption of logistic regression is that there are no extreme outliers. I removed cases from the sample that violated this assumption.

The output of the logistic regression models shows the results from a number of tests performed on the variables. The tests that are reviewed as part of this study are the Omnibus Tests of Model Coefficients, Hosmer and Lemeshow Test, Nagelkerke R sqaure values, B values, Wald Test and the Exp B – Odds Ratio value. (Included in the odds ratio are the upper and lower 95% confidence intervals).

The Omnibus Tests of Model Coefficients and the Hosmer and Lemeshow Test are considered goodness of fit tests. The Omnibus Tests of Model Coefficients gives an "overall indication of how well the model performs" when compared to Block 0 – the model with no variables (Pallant 2007:174). A significant result for this test is a value less than .005. The

Hosmer and Lemeshow test works by "creating ordered groups of subjects and then comparing the number actually in each group with the number predicted into each group by the logistic regression model" (Trabanick and Fidell 2001:538). In a good model "most of the subjects with outcome 1 are in the higher deciles of risk and most with outcome 0 in the lower deciles of risk" (Trabanick and Fidell 2001:538). In this study, outcome 1 is a municipality has adopted a multi-municipal plan and outcome 0 is that the municipality has not adopted a multi-municipal plan. A significant result for this test is a value greater than .05.

The Nagelkerke R Square measure the amount of "variation in the dependent variable explained by the model" (Pallant: 2007:174). The Wald Test explains the level of contribution the individual variables have to the overall model (Trabachnick and Fidell 2001: 539). A significant result for this test is a value less than .05. The B values are used in an equation to "calculate the probability of a falling into a specific category" (Pallant 2007:175). This value is helpful to the analysis by showing the direction of the relationship between the dependent and independent variables. A positive number indicates there is an increase in the likelihood of a municipality adopting a multi-municipal plan and a negative number indicates a decrease (Pallant 2007:175).

The final result examined in this study is the Exp B or the Odds Ratio. Exp B represent the odds the independent variable has on a municipality adopting a multi-municipal plan. Included in the results are the upper and lower 95% confidence intervals which provides that we can be 95% confident that the result is the true odds ratio (Pallant 2007:177).

After a review of both bivariate and multivariate regression models, it was determined that the strongest models were those that only included the dependent variable and one

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independent variable. The following table displays the results of the single independent variable

included in the logistic regression.

Table 15. Results of 36 Single Variable Regression Models on ALL Variables in the Study (part 1 of 2)

Variable	Omnibus Tests of Model Coefficients	Hosmer and Lemeshow Test	Nagelkerke R sqaure	B
Single-Municipal Plan	.000	1.00	.146	1.907
Local Planning Commission	.000	.	.060	1.069
Member of a Council of Government	.008	.	.004	.243
Member of a Cooperative	.802	.	.000	-.040
Interstate Access within 1 Mile	.221	.	.001	-.126
Interstate Access within 5 Miles	.002	.	.006	.284
Population (2000)	.237	.000	.001	.000
Population Density (2000)	.346	.000	.001	.000
Square Mileage	.003	.006	.005	-.077
Family below Poverty Level	.009	.605	.004	-.020
Low Income (Under 25,000)	.000	.343	.020	-.028
Middle Income (25,000-99,999)	.678	.824	.000	-.002
High Income (Above 100,000)	.000	.000	.015	.020
High School Diploma and Under	.000	.000	.013	-.016
Some College to Bachelors	.000	.000	.015	.025
Graduate or Professional Degree	.002	.000	.005	.023

Prime Adulthood (20 - 44)	.020	.081	.003	.019
Middle Age (45 - 64)	.064	.389	.002	-.015
Retirement Age (65 and above)	.000	.926	.013	-.040
Owner Occupied	.745	.099	.000	-.001
Renter Occupied	.745	.099	.000	.001
Vacant	.000	.028	.048	-.037
Median Property Value (PV)	.000	.000	.020	.000
Property Value Under 99,999	.007	.000	.040	-.016
Property Value 100,000 to 199,999	.001	.132	.007	.010
Property Value 200,000 to 299,999	.000	.229	.035	.029
Property Value 300,000 or Above	.000	.000	.008	.010
Home Built 2000 or later	.000	.012	.017	-.015
Home Built 1970 to 1999	.436	.559	.000	.003
Home Built 1940 to 1969	.002	.981	.006	.009
Home Built 1939 or earlier	.000	.099	.015	.032
In Labor Force	.000	.799	.024	.037
Employed	.000	.524	.018	.032
Median Travel Time to Work	.625	.131	.000	-.004
Sex (percent male)	.024	.000	.003	-.012
Race (percent white)	.564	.063	.000	-.006

Table 15. Results of 36 Single Variable Regression Models on ALL Variables in the Study (part 2 of 2)

Variable	S.E	Wald	*p*	Exp B
Single-Municipal Plan	.139	188.891	.000	6.732
Local Planning Commission	.111	93.025	.000	2.912
Member of a Council of Government	.091	7.099	.008	1.274
Member of a Cooperative	.158	.062	.803	.961
Interstate Access within 1 Mile	.102	1.512	.219	.882
Interstate Access within 5 Miles	.090	9.891	.002	1.329
Population (2000)	.000	1.435	.231	1.000
Population Density (2000)	.000	.888	.346	1.000
Square Mileage	.002	8.155	.004	.993
Family below Poverty Level	.008	6.600	.010	.980
Low Income (Under 25,000)	.005	33.048	.000	.973
Middle Income (25,000-99,999)	.005	.173	.678	.998
High Income (Above 100,000)	.004	27.329	.000	1.020
High School Diploma and Under	.003	23.289	.000	.984
Some College to Bachelors	.005	26.545	.000	1.025
Graduate or Professional Degree	.007	9.419	.002	1.023
Prime Adulthood (20 - 44)	.008	5.422	.020	1.019
Middle Age (45 - 64)	.008	3.403	.065	.985
Retirement Age (65 and above)	.009	20.110	.000	.960

Owner Occupied	.004	.106	.745	.999
Renter Occupied	.004	.106	.745	1.001
Vacant	.005	59.690	.000	.963
Median Property Value (PV)	.000	35.321	.000	.224
Property Value Under 99,999	.002	65.872	.000	.985
Property Value 100,000 to 199,999	.003	11.353	.001	1.010
Property Value 200,000 to 299,999	.004	61.197	.000	1.029
Property Value 300,000 or Above	.003	13.724	.000	1.010
Home Built 2000 or later	.003	29.199	.000	.986
Home Built 1970 to 1999	.004	.611	.434	1.003
Home Built 1940 to 1969	.003	9.778	.002	1.009
Home Built 1939 or earlier	.006	26.511	.000	1.003
In Labor Force	.006	38.337	.000	1.038
Employed	.006	29.898	.000	1.032
Median Travel Time to Work	.008	.238	.626	.996
Sex (percent male)	.005	5.311	.021	.988
Race (percent white)	.011	.330	.566	.994

Hypothesis Variables

H1 – Municipalities with a municipal comprehensive plan will adopt multi-municipal plans

H0 – Municipal comprehensive plans have no effect on adoption of multi-municipal plans.

The first regression model includes previous adoption of a municipal comprehensive plan as the independent variable. This variable is a good fit for the model as the Omnibus Tests of Model Coefficients results are .000 and the Hosmer and Lemeshow Test results are 1.00, both highly significant. The Negelkerke R Square score is .146, indicating that 14.6 percent of the

variability in adoption of multi-municipal plans is explained by the adoption of a municipal plan. The B value is 1.907, indicating there is a positive relationship between municipal plans and multi-municipal plans. Municipalities that have adopted a municipal plan are more likely to also adopt a multi-municipal plan. The Wald test value is also significant at .000, which supports the model's predictive ability.

The Exp B or odds ration value is 6.732. This means that a municipality that has previously adopted a municipal comprehensive plan is 6.732 times more likely to adopt a multi-municipal plan. This odds ratio is the largest of all the independent variables and overall this model is the strongest predictor of a municipality adopting a multi-municipal plan. The null hypothesis can be rejected.

H_2 –Municipalities with a planning commission will adopt multi-municipal plans
H_0 – Planning commissions have no effect on adoption of multi-municipal plans.

The second regression model includes municipality has planning as the independent variable. The Omnibus Tests of Model Coefficients results are .000, which indicates the model is a good fit. The Negelkerke R Sqaure score is .060, indicating that 6 percent of the variability in adoption of multi-municipal plans is explained by the municipality having a planning commission. The B value is 1.069, indicating there is a positive relationship between planning commissions and multi-municipal plans. Municipalities that have a planning commission are more likely to also adopt a multi-municipal plan. The Wald test value is also significant at .000, which supports the model's predictive ability.

The Exp B or odds ration value is 2.912. This means that a municipality that have a planning commission are 2.912 times more likely to adopt a multi-municipal plan. This odds

ratio is the second largest of all the independent variables and overall this model has a slight predictability of a municipality adopting a multi-municipal plan. After examining the regression, we can reject the null hypothesis.

H_3 – Municipalities that are members of either a council of governments or a cooperative will adopt multi-municipal plans

H_0 – Membership in either a council of governments or a cooperative have no effect on adoption of multi-municipal plans.

My third hypothesis includes two variables, member of a council of government and a member of a cooperative. A regression model was performed on each variable as the only variable in the model.

The first regression model includes being a member of a council of governments as the independent variable. The Omnibus Tests of Model Coefficients results are .008, which indicates the model is a good fit. The Negelkerke R Square score is .004, indicating that only 0.4 percent of the variability in adoption of multi-municipal plans is explained by being a member of a council of government.   The B value is .243, indicating there is a positive relationship between council of government membership and multi-municipal plans, although only a small extent. The Wald test value is also significant at .008, which supports the model's predictive ability.

The Exp B or odds ration value is 1.274. This means that a municipality that is a member of a council of governments is 1.274 times more likely to adopt a multi-municipal plan. The odds ratio is very close to a 1:1 relationship, meaning that being a member of a council of government is only a very slight predictor of a municipality adopting a multi-municipal plan.

The second regression model includes being a member of a cooperative as the independent variable. The Omnibus Tests of Model Coefficients results are .802, which

indicates the model is not a good fit. The Negelkerke R Square score is .000, indicating that none

of the variability in adoption of multi-municipal plans is explained by being a member of a

cooperative.   The B value is -.040, indicating there is a negative relationship between

cooperative membership and multi-municipal plans. Municipalities that are a member of a

cooperative are less likely to adopt a multi-municipal plan. The Wald test value is not significant

at .803, and does not supports the model's predictive ability.

The Exp B or odds ration value is .96. This further supports that municipalities that are

members of a cooperative are less likely to adopt a comprehensive plan over municipalities that

are not members of a cooperative. For this variable we must accept the null hypothesis that

being a member of a cooperative does not increase the likelihood of the adoption of a multi-

municipal plan.

H4 – Municipalities that are located within five (5) miles or one (1) mile of an interstate will
adopt multi-municipal plans

H0 – Location within 5 miles or 1 mile of an interstate has no effect on adoption of multi-
municipal plans

My fourth and final hypothesis also includes two variables, municipality is located within

five (5) miles of an interstate and the municipality is located with one mile of an interstate.   A

regression model was performed on each variable as the only variable in the model.

The first regression model includes the variable that a municipality is located within five

(5) miles of an interstate as the independent variable. The Omnibus Tests of Model Coefficients

results are .002, which indicates the model is a good fit. The Negelkerke R Square score is .001,

indicating that only 0.1 percent of the variability in adoption of multi-municipal plans is

explained by the municipality being located within five miles of an interstate   The B value is

.284, indicating there is a positive relationship between the municipality being located within five miles of an interstate and multi-municipal plans, although only to a small extent. The Wald test value is also significant at .002, which supports the model's predictive ability.

The Exp B or odds ration value is 1.329. This means that a municipality being located within five miles of an interstate highway is 1.329 times more likely to adopt a multi-municipal plan. The odds ratio is very close to a 1:1 relationship, meaning that being a within five miles of an interstate is only a very slight predictor of a municipality adopting a multi-municipal plan.

The second regression model includes the municipality being located within one mile of an interstate as the independent variable. The Omnibus Tests of Model Coefficients results are .221, which indicates the model is not a good fit. The Negelkerke R Square score is .001, indicating that almost none of the variability in adoption of multi-municipal plans is explained by a municipality being within one mile of an interstate.   The B value is -.126, indicating there is a negative relationship between a municipality being within one mile of an interstate and the adoption of a multi-municipal plans. Municipalities that are within one mile of an interstate are less likely to adopt a multi-municipal plan. The Wald test value is, however, significant at .000 and does supports the model's predictive ability.

The Exp B or odds ration value is .882. This further supports that municipalities that are within one mile of an interstate are less likely to adopt a comprehensive plan over municipalities that are located farther away from an interstate. For this variable we must accept the null hypothesis that being within one mile of an interstate does not increase the likelihood of the adoption of a multi-municipal plan.

Additional Variables of Note

After a careful examination of the single variable regression models I concluded that no additional independent variables contributed to strengthening the model.

FINDINGS

This study found that, of the variables included in the regression models, the single greatest predictor is municipalities that have previously adopted a municipal comprehensive plan. According to the regression model, municipalities with municipal comprehensive plans are 6.732 times more likely to adopt a multi-municipal plan. When this variable was created, any municipality that had adopted a municipal comprehensive plan any time in the past was included; no distinction was made between municipalities that have planned in the past versus municipalities that are actively planning. This variable may be strengthened in future research by only including municipalities that have updated or created a municipal plan within 10-15 years of the passage of Acts 67 and 68.

Municipalities that have a planning commission are 2.912 times more likely to enter into a multi-municipal plan than municipalities without a planning commission. This supports the assertion that a municipality, having taken the initiative to organize a planning commission and therefore having greater access to experienced and educated planners, are in a better position to plan regionally.

A municipality's participation in either a council of government or a cooperative, surprisingly, had little impact on the predictability of a municipality entering into a multi-municipal plan. It is likely the case that participation in a council of government or a cooperative is not a good indicator of a municipality's addressing regional concerns. Future research may

find better results by identifying municipalities that share school districts or are sharing services, such as police departments, emergency services, fire departments or wastewater treatment facilities.

    A municipality's location along a major transit route proved not to be a contributing factor to municipalities entering into a multi-municipal plan.

Identifying alternative variables would be an important step for future research. For example, would changes in population be a measure of municipalities that are growing? Or, would there be a different approach to planning depending on municipal class? Another option for future research would be to approach the analysis from a geographical point of view and see if there are any patterns regionally.

LIMITATIONS TO RESEARCH

The greatest limitation to this study is related to the logistic regression analysis. In trying to identify what combination of variables are the strongest predictor of a municipality are entering into a multi-municipal plan, there were no variable combinations that surpassed the bivariate regression.   Thus, this study, although it was the intention, does not include the results of a multivariate logistic regression analysis.

This study was directed at discovering factors that could influence multi-municipal planning; however, it is important to note that there may be additional factors that influence participation in multi-municipal planning that were not specifically identified here. Additionally, the variables which were chosen to represent the concepts of access to planning tools and history of addressing regional concerns, may not accurately quantify those concepts. Future research

should try and identify alternative variables that may better represent the nature of these concepts.

Another limitation is that data on multi-municipal compiled through a 2001 survey conducted by the Governor's Center for Local Government Services. As survey participation was voluntary, the results do not necessarily represent a complete catalog of all municipal plans. It is for this reason that the Elibrary was only used as a resource for individual municipal plans, as the majority of municipalities are accounted for.

Thirty-two (32) variables were sourced from the 2007-2011 American Community Survey (ACS). As opposed to the dicentennial U.S. Census wherein all households are surveyed, the data included in the ACS is gathered by sampling a small percentage of the entire population, about 1 in every 38 households. (U.S. Census Bureau 2000).

POLICY RECOMMENDATIONS

Pennsylvania has a long tradition of strong municipal autonomy, and its approach to land use planning falls right in line with that tradition, wherein land use planning is not mandated, but a voluntary action taken by the municipality. The voluntary nature of planning is an obstacle for advocates of multi-municipal plans. Joint planning can easily be misconceived at worst as a forerunner to municipal consolidation or at least a loss of municipal autonomy. For these reasons, increased education is the primary policy recommendation. Through the passage of Acts 67 and 68, safeguards are built into the Pennsylvania Municipal Planning Code that ensure municipalities will remain autonomous and in control of their own lands uses and zoning. This aspect, along with all the other beneficial tools available through multi-municipal plans need to be continually reinforced to Pennsylvania local governments. In particular, municipalities that

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have no planning commission and no history of past planning efforts should be targeted for outreach from State officials.

Currently, municipalities are able to apply to the Pennsylvania Department of Community and Economic Development for a grant that provides up to 50% of the cost for the preparation of a municipal or multi-municipal plan (Paulsen and Wilson 2008:2). Act 68 states that the Commonwealth can give preferential funding to municipalities that are entering into a multi-municipal plan. A second policy recommendation is for Pennsylvania to continue to give preferential funding for multi-municipal planning efforts and also to expand preferential funding throughout other departments in which funding affects land use. While this provision is included as an option in the Acts, it needs to be enforced. These departments include the Department of Transportation, the Department of Conservation and Natural Resources, the Department of Environmental Protection and the Department of Community and Economic Development. Municipalities that are not participating in multi-municipal planning would still be eligible for funding from all the aforementioned departments, but those municipalities that are in the process of developing or have adopted a multi-municipal plan would be first in consideration for funding approval. This would pertain to a myriad of projects, ranging from road improvements to wildlife conservation.

As an alternative to multi-municipal planning, Pennsylvania should consider amending the laws pertaining to municipal consolidation. As it currently stands, no municipality can dis-incorporate without voter approval (Gazarik 2013). Municipalities under tremendous financial strain or hardship do not have the ability to merge with a neighboring municipality unless voters from both the municipality dissolving and the municipality taking on that municipality approve

the proposal. That hurdle is a dilemma for municipalities experiencing extreme hardships. The

law should therefore be amended to allow for forced mergers.

CONCLUSION

      After a long history of uncoordinated land development and sprawl, leaders recognized

that Pennsylvania needed to take steps to promote responsible land use and development. The

Pennsylvania legislation and Governor Thomas Ridge decided to act by amending the

Pennsylvania Municipal Planning Code in order to encourage municipalities to approach land

use planning regionally, while still retaining their autonomy through multi-municipal plans. In

the ten years after the Acts 67 and 68 amendments, 671 of the Commonwealth's 2571

municipalities have entered into a multi-municipal plan.

      This study successfully identified that both municipalities that have previously adopted a

municipal comprehensive plan and municipalities with a planning commission are more likely to

enter into such a multi-municipal plan. While this is a great beginning, there is still a large

amount of progress to be made yet, particularly now that the amendments have lost their initial

momentum. Pennsylvania needs to continue to invest in further education for municipal leaders

and in funding programs to help facilitate the creation of multi-municipal plans.

      In the end, it appears that municipalities that have already taken initiative to plan for

future land use development and growth are also inclined to take land use planning to the

regional level. The fact that the results could not identify additional predictors for municipalities

to enter into a multi-municipal plan, highlights the broad diversity in Pennsylvania and the need

for additional research.

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