

Development Sprawl in Texas

by

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Chapter I: Introduction

Are We Growing Dumb?

Large residential subdivisions under construction or planned outside city boundaries in the Dallas-Fort Worth area will bring more than 80,000 people to currently vacant farmland (Lavigne, 2003). Colonias, which are substandard residential developments, are springing up outside the City of Brownsville (Cavazos, 2003). This shared pattern of horizontal development occurring outside city boundaries is commonly referred to as development sprawl. It is not simply growth but the expansive spatial growth of low-density development (Carruthers & Ulfarsson, 2002, p. 314).

A review of scholarly literature reveals that the effects of development sprawl are positive “smart” and negative “dumb.” Argued positive effects of sprawl are drawn from the realization of consumers’ preference for single-family housing and that type of housing’s positive influence on wealth, psychological health, and community and political participation.¹ Argued negative effects of development sprawl include the destruction of open-space and farmland, increased air pollution due to automobile dependency, weakened social ties, decreased worker productivity, premature over-utilization of city infrastructure, decreased quality of police and fire protection services, and inadequate city tax bases.²

The Path to Enlightenment: Government Policy

The federal government and many state governments implement policies to “enlighten” residents or, more specifically, to control the perceived negative effects of development sprawl.

¹ See, Heim, 2000; Ohls & Pines, 1975; Persky & Lester, 2002; Phillips & Goodstein, 2000.

² See, Carr & Feiock, 2001; Carruthers & Ulfarsson, 2002; Daniels, 2001; Dowling, 2000; Freeman, 2001; Gurwitt, 2000; Leo & Beavis, 1998; Liner & McGregor, 1996; Prud’homme & Lee, 1999; Speir & Stephenson, 2002; Stoel, 1999.

City governments, however, bear the primary responsibility for managing development sprawl either through state or federal directives and incentives or through local rule.³ Of all development policies used by cities, annexation and regional governance are considered mega-policies, because both extend the implementation area of other development policies.⁴

The mega-policies have captured considerable public attention as evidenced in newspaper articles across the state. In a January 1, 2003 *San Antonio Express-News* article, Char Miller, described as an urban expert, claimed that San Antonio's economic health largely depends on the city's ability to annex growth occurring outside its boundaries (McCollough, 2003).

Although a legitimate city policy, annexation often incites great opposition from those to-be-annexed. For example, in 2002, the City of Fort Worth planned to annex approximately 55-square miles of land containing primarily residential subdivisions. Great public opposition, however, forced the city to scale back the annexations to 18-square miles (Tinsley, 2003).

A second example is unfolding in Conroe, Texas. Residents proposed for annexation are currently opposing their absorption into the city (Durham, 2003). The city is undergoing annexation proceedings, according to Conroe's City Manager Craig Lonon, because "annexation allows [the city] to spread the costs of services." Residents are opposed to the annexation on financial and "moral" grounds. According to resident-to-be Pat Leevy, "I'm not in favor of paying big city taxes for nothing." Another resident-to-be John Pearl argues, "It's not about it being legal. It may be legal, but it is not moral or ethical, and it is just flat wrong."

On June 4, 2003, a staff writer for the *Abilene Reporter News* reported that regional cooperation, not annexation, is the answer to protecting the economic viability of the Abilene

³ Such local policies include: annexation, highway expansion and development, impact fees on development, infill development programs, outright purchases of land, planning and zoning ordinances, regional government, tax policies, and urban growth boundaries (Daniels, 2001; Leo & Beavis, 1998; Stoel, 1999).

⁴ See, Daniels, 2001, p. 240; Leo & Beavis, 1998, p. 190.

area (De Jesus, 2003). The article notes that community leaders are becoming increasingly aware of the interconnectedness of the region. As John Muller, President of Cisco Junior College, is quoted, “a rising tide raises all ships.”

Regional approaches to governance are being realized in the Dallas-Fort Worth area as described in a November 14, 2003 *Fort Worth Star-Telegram* article (Dickson, 2003). The North Central Texas Council of Governments, a state authorized voluntary regional government, is designing a 25-year transportation plan to accommodate the anticipated population increase (three-million residents). Among other provisions, the plan will likely double the current number of freeways connecting the region’s cities and unincorporated areas.

Research Purpose

Although individually, development sprawl, annexation, and regional governance have received considerable attention by scholars and the press, most discourse on their interconnectedness is hypothetical at best and, in most cases, disjointed clues. This paper attempts to identify the empirical link between these issues in Texas.

By way of background, the Texas Legislature does permit cities to implement most development management policies, including the mega-policies. Annexation authority, however, has been limited in recent years with the passage of policy favoring private property rights.⁵ In addition, Texas regional governments possess limited state-vested authority.⁶

Aside from granting cities the ability to implement a variety of development policies, the Texas state government has remained silent on the issue of development sprawl. The state has not conducted a comprehensive assessment of the issue and has failed to provide cities guidance on if and how to address sprawling development.

⁵ See, S.B. 89, 76th Legislature; TEX. LOC. GOV’T CODE ANN., Ch. 43.

This research study, consequently, is a preliminary attempt to assess how development sprawl in Texas affects city government. Specifically, the purpose of the research study is to explore Texas city managers' assessments of (1) the effects of development sprawl on city finance and service provision, (2) the relationship between development sprawl and city annexation and (3) the relationship between development sprawl and their impressions of regional governance.

The study is important for two reasons. First, the study provides preliminary data on the need for the state to protect annexation authority and to encourage regional governance. Second, it provides preliminary data on the need for an enhanced state role in development control and planning.

Chapter Summaries

To fulfill the three research purposes, the remainder of the study is divided into five chapters. Chapter II reviews the relevant literature on the causes, effects, and cures of development sprawl and presents the conceptual framework (working hypotheses). Next, the demographic and legal setting of the study's geographic focus, Texas, is presented in Chapter III. Data showing the rapid growth of Texas and the legal framework cities operate within to manage growth are discussed. Chapter IV operationalizes the working hypotheses (conceptual framework) presented in Chapter II, with careful consideration of the demographic and legal setting presented in Chapter III. The survey instrument is presented as well as procedures used to collect and analyze the survey data. In the following chapter, Chapter V, the results of the survey are presented and analyzed for each working hypothesis. The final chapter, Chapter VI,

⁶ TEX. LOC. GOV'T CODE ANN. Ch. 391; Texas Association of Regional Councils, 2003.

synthesizes survey results into the general body of research on development sprawl and recommends avenues for future research and state action.

Chapter 2: Literature Review

Chapter Purpose

This chapter examines the scholarly literature on the causes and effects of development sprawl as well as city policies employed to manage development sprawl's negative effects. This information is critical to understanding the complexity and significance of the development sprawl debate and serves as the foundation for the working hypotheses that are developed throughout the chapter.

Development Sprawl Defined

Simply defined, development sprawl refers to the expansive spatial growth of single-family, low-density residential development, often occurring outside city boundaries. A comprehensive definition developed by Carruthers and Ulfarsson (2002, p. 314) describes development sprawl as “unplanned, uncontrolled, and uncoordinated single use development that does not provide for a functional mix of uses and/or is not functionally related to surrounding land uses and which variously appears as low-density, ribbon or strip, scattered, leapfrog, or isolated development.” Development sprawl is characterized by a dominance and dependence on private automobiles for transportation, fragmentation of powers over land use, and large fiscal disparities among communities (Carruthers & Ulfarsson, 2002, 314).

According to Black (1996, p. 6), low-density, single-family subdivisions and strip commercial development have concerned planners since the 1930s. At a 1937 National Planning Conference, Earle Draper, Director of Land Planning and Housing for the Tennessee Valley Authority, expressed distaste for sprawling development: “Perhaps diffusion is too kind a word... In bursting its bounds, the city actually sprawled and made the countryside ugly..., uneconomic [in terms] of services, and of doubtful social value” (Black, 1996, p. 6).

Concern over the harmful effects of development sprawl has intensified over the past 15 years as an increasing number of governments implement policies to manage sprawl's harmful effects. There is no one uniform and quantitative measurement for sprawl, and the effects of sprawl on each community are not uniform. The stakes in this debate are substantial and will ultimately affect a key element of the American lifestyle: the consumption of large amounts of affordable living space.

Factors Contributing to Development Sprawl: An Economic Framework

Before examining effects of development sprawl and the variety of techniques used by local governments to control sprawl, it is helpful to examine its sources. The factors contributing to the proliferation of sprawling development are best understood through an economic framework.

Shifts in Supply

The law of supply specifies that suppliers of a good respond to price by changing the quantity supplied: as price increases, the supply of a good increases (Wessels, 2000, p. 30). The supply of a good increases, because gains in potential profits attract new suppliers and greater production by current suppliers (Wessels, 2000, p. 35). Shifts in the supply curve of a good are the result of non-price determinants (Wessels, 2000, pp. 49-50). A shift in supply, depending on the direction, results in the price of a good at any particular quantity to decrease or increase.

In the case of development sprawl, the total amount of development has increased and shifted the supply curve in a positive direction: the amount of single-family housing has increased at any given price. The remainder of this section discusses the market forces leading to the pattern of sprawling development: availability and price of land.

Supply of Land

The supply of land available for low-density development is greatest outside city limits. Many cities are built out, and/or there is a scarcity of low-density lots within the city boundaries according to Heim's (2001, p. 246) review of U.S. Census data and scholarly literature. Consequently, a developer interested in developing land is "forced" to develop outside city limits.⁷

Price of Land

Even when land within city limits is available for development, developers often choose to develop outside city boundaries. Infill development, development of vacant lots or abandoned development sites surrounded by existing development, may be burdensome to develop (Heim, 2001, p. 246). Heim (2001, p. 246) explains that these infill sites may require negotiation with existing neighborhood groups, environmental remediation, and demolition of existing structures. In addition, Carruthers and Ulfarsson (2002, p. 314) point out that infill development within a city's boundaries is often less attractive to potential homebuilders, because the city may enforce building and use requirements that conflict with the development plans.

The development occurring outside city boundaries is often not adjacent or close to cities, because, vacant land adjacent or close to existing development is more expensive than land further away from existing development. Heim (2001, p. 246) explains that the price of land increases as the number of available improvements to the land increases: developed land is more expensive than farmland or open spaces. In addition, Heim (2001, p. 246) argues that land adjacent to existing development is speculated as having greater value due to the increased likelihood it will be developed as a more intensive use. Ohls and Pines (1975, p. 225) in a 1975

⁷ A 2000 report from the U.S Census Bureau (2001c) show that there is much more housing in suburban and rural areas combined than in central cities.

article arrive at a similar conclusion after a review of land prices. They note that low-density, discontinuous development assures the lowest price for the largest amounts of available land.

Demand

The law of demand specifies that consumers respond to price by changing the quantity demanded: as price decreases, the quantity demanded increases (Wessels, 2000, p. 30). The demand for a good increases, because lower prices attract new buyers and greater consumption of a good by current buyers (Wessels, 2000, p. 32). In the case of development sprawl, the positive shift in land supplied in areas outside city boundaries lowers or slows the increasing cost of developed land, thus, demand increases.

Shifts in Demand

In addition to consumer response to a new supply curve, the demand curve for development in areas outlying cities has shifted as a result of population growth and consumer preferences. As with shifts in supply, shifts in demand are the result of non-price determinants (Wessels, 2000, p. 34). The effects of these shifts can either increase or decrease the previous demand for housing at any particular price and quantity.

In the case of development sprawl, non-price determinants, such as population growth, consumer preferences for single-family housing and location, and technological advancements, have shifted the demand for single-family housing in a positive direction: the demand for single-family housing has increased at any given price. The remainder of this section discusses the three non-price determinants.

Population Growth

First, as a population grows, consumption of resources, including land for development also grows. Before 1900, there were fewer than 75 million residents in the U.S.; today, there are over 270 million residents (Daniels, 2001, p. 231).

This population growth is concentrated in metro areas. Today, four out of five U.S. citizens live in metro areas (Stoel, 1999, p. 8). More specifically, most of the population growth is occurring in metro areas outside city boundaries⁸, because city-regions are exploding into the surrounding countryside at rates eight to ten times greater than population increases⁹.

Preferences for Single-Family Housing and Location

Second, Americans prefer single-family housing outside large cities. Specifically, Baldassare (1992, p. 486), found in surveys conducted by scholars in 1972, 1975, 1977, and 1981 that most Americans prefer to own and live in single-family homes in small communities within commuting distance to large cities. In addition, homeowners in small communities are more likely to have positive overall ratings of their communities and their specific local features such as schools, roads, police, and parks than in large communities (Baldassare, 1992, p. 486). Baldassare (1992, pp. 486-487) also found that as suburbs grew in the 1970s, resident dissatisfaction with suburban quality of life increased. He concluded, after a review of the survey data and growth patterns, that as suburbs become closer in size and character to central cities, individuals seek housing on the fringe of suburbs (suburbs of suburbs) (Baldassare, 1992, p. 487).

⁸ In 1960, the U.S. Census Bureau designated 9 percent of the U.S. land area as a metro area; in 1995, 19 percent of the U.S. land area was officially designated as a metro area (Stoel, 1999, p. 8).

⁹ For example, from 1970-1990, the New York region experienced an 8 percent population growth but a 65 percent growth in urbanized land (Geddes, 1997, p. 40). During that same period, the Chicago region experienced a 4 percent population growth but a 46 percent growth in urbanized land (Geddes, 1997, p. 40). Finally during that same period, the Detroit region experienced an 8 percent population decline, but a 33 percent growth in urbanized land (Geddes, 1997, p. 40).

Technological Advancements

Third, 20th century technological advancements have decreased the opportunity costs associated with buying housing outside city limits; thus, increasing consumption. Opportunity costs are the value of what is given up to pursue a given course of action. Specifically, an opportunity cost is the value of the next best alternative forgone to take a given course of action (Wessels, 2000, p. 3).

Single-family housing is typically more expensive than multi-family housing (Rybczynski & Linneman, 1999, p. 34). Costs are further increased if single-family homes are located in areas outlying established developments, because residents must pay the costs associated with commuting to work, leisure, and other activities (Rybczynski & Linneman, 1999, p. 34). Increases in the disposable incomes of workers and technological advancements, however, have decreased the opportunity costs of (or the sacrifice necessary for) residing in sprawling developments.

Rybczynski & Linneman (1999, p. 31) note that the disposable income of households increased during the 20th century due to increases in real wages and the number of two-earner families. More households, consequently, have become better able to realize preferences for single-family, low-density housing. Buying and residing in a single-family home has become less of a sacrifice, because households have acquired more money to spend.

It is important to note, that these preferences exist despite the worst of economic times. For example, Black (1996, p. 6) explains that the preference for homeownership was prevalent during the Great Depression. Subsequently, the United States has suffered multiple recessions, including the present economic downturn. This preference is likely realized less often during economic downturns, but surveys clearly demonstrate that the preference persists.

In addition, access to undeveloped areas not adjacent to developed areas was expanded due to 20th century technological advances in communications. Rybczynski and Linneman (1999, p. 32) explain that the television, VCR, personal computer, Internet, and wireless communication devices have drastically reduced the isolation that historically characterize rural areas. Location has become obsolete to communication. Living or working outside large urban centers has not resulted in sacrificing entertainment, leisure, or business communications; thus, opportunity costs have been lowered.

Access to undeveloped areas not adjacent to developed areas was also expanded due to transportation innovations during the 20th century. Rybczynski and Linneman (1999, p. 31) note that advancements reducing fares for passenger air travel has made rapid travel a reality for many individuals. Most significant to closing geographic distances rapidly for the majority of individuals, however, have been advancements in the affordability and quality of automobiles according to Dowling (2000, p. 875 and Geddes (1997, p. 41).

Automobile advancements have contributed to the proliferation of the automobiles, which provide convenient access to outlying areas (Dowling, 2000, p. 875; Geddes, 1997, p. 41). Convenient access to outlying areas, thus, has reduced the sacrifices (opportunity costs) necessary to reside in these areas.

Government Policy

Federal, state, and local government policies influence the patterns of supply and demand for single-family housing. The policies can be broken into three categories: housing policy, property tax policy, and infrastructure development policy. Taken as a whole, government policies subsidize the cost of single-family housing, further shifting the supply of single-family

housing in a positive direction. In response, more individuals are able to realize their preference for single- family housing.

Housing Policy

Influencing market factors of supply, government subsidies shape the pattern of urban development. Federal, state, and local governments regularly improve accessibility in outlying, undeveloped areas through housing programs and infrastructure extension.

According to Orlebeke (2002, p. 158), the federal government has successfully encouraged homeownership at varying levels since the 1930s. During the Great Depression, unemployment rates and the banking crisis resulted in massive mortgage defaults. In response, the federal government established the Home Owners Loan Corporation to help homeowners in default of their mortgage and then established the Federal Housing Administration, which created today's industry standard of offering low-interest, long-term mortgages (Orlebeke, 2002, pl 159).

Housing building programs implemented by the federal government in the 1970s targeted areas outside central cities. During this decade, the Federal Housing Administration favored new housing construction in the suburbs not only to increase the amount of single-family housing but to increase the racial diversity of neighborhoods (Orlebeke, 2002, pp. 164-165). In 1980s, the federal priority for building new housing ceased and a voucher program, which continues today, ensued (Orlebeke, 2002, p. 165).

The federal government has also established private housing corporations, which are operating today, that provide a secondary market for mortgages. These housing corporations secure a constant flow of low-interest mortgage capital for primary lending markets (Brendsel & Glenn, 2002, p. 10; Fannie Mae, 2003). The first mortgage corporation, Fannie Mae (Federal

National Mortgage Association) was created as a governmental entity in 1938 and became private in 1968 by congressional mandate (Fannie Mae, 2003). The second, Freddie Mac (Federal Home Loan Mortgage Corporation) was created in 1970 by congressional mandate (Brendsel & Glenn, 2002, p. 10). Since its creation, Fannie Mae has secured mortgages for over 49 million homes (Fannie Mae, 2003), and Freddie Mac has secured mortgages for over 30 million homes (Brendsel & Glenn, 2002, p. 10).

In culmination, the federal housing policies appear to be successful. Before WWII, 43% of all households owned their residences (Orlebeke, 2002, p. 159). By 1980, the percentage was 65.5%, and in 1995, it was 67.5% (Orlebeke, 2002, p. 159). Since single-family housing consumes more space than multi-family housing, Orlebeke (2002, p. 160) concludes that federal policies favoring homeownership contribute in some way to sprawl. The direct link, however, is difficult to determine: a definitive study examining the direct link does not exist (Orlebeke, 2002, p. 160).

Property Tax Policy

Although not an outright subsidy, government property tax policies contribute to sprawling development by taxing land and improvements (buildings) at the same rate. Daniels (2001, p. 230) and Gihring (1999, p. 63) argue that policies taxing land and improvements at equal rates discourage improvements or at a minimum do not provide an incentive for compact development. Gihring (1999, p. 63) explains “under the present equal-rate system of taxation, the owner has no tax-based incentive to invest in property improvements, because doing so will result in higher taxes.”¹⁰

¹⁰ Black (1996, p. 52) points out that federal income tax deductions and tax subsidies totaled 75 billion in 1995 for an individual benefits of \$1,100 to \$1,200 annually.

Infrastructure Development Policy

Infrastructure extension also contributes sprawling development by providing access to undeveloped areas. Highway construction strongly influences growth and metropolitan form, especially the interstate highway system conceived during the Eisenhower administration (Persky, Kurban, & Lester, 2000, p. 230). In addition, state and local governments also “condone” sprawl by extending infrastructure, whether it be road, water, sewer, or electric services to outlying areas (Dowling, 2000, p.878; Heim, 2001, p. 247).

Negative Externality

The above discussed economic factors contributing to development sprawl are tied to the basic economic concept of negative externality. A negative externality occurs when the consumption of private goods leads to uncompensated costs to society (Wessels, 2000, pp. 493-494). As it relates to this study’s topic, the true social cost of sprawling development is not accurately represented in the private cost necessary to buy and live in sprawling developments.

Government subsidies and tax policies result in markets undervaluing the negative effects of development sprawl for the community and overvaluing the positive effects of development sprawl for the resident. Increases in disposable income and technological advancements in communications and transportation further lower the cost of developing and residing in developments located outside city boundaries. The result is that development sprawl persists at a much greater rate than society can absorb without harm.

Political Fragmentation

Political fragmentation also contributes to sprawl. Political fragmentation refers to the number of governmental jurisdictions in a particular geographic area. For example, a metropolitan area can be made up of one large central city and a few mid-sized suburban cities, or a metropolitan area can be made up of one large central city and many mid-sized and small

surrounding cities. The larger the number of government jurisdictions, the greater the political fragmentation. Carruthers and Ulfarsson (2002) found a positive relationship between political fragmentation and sprawl. They evaluated the relationship between political fragmentation and measures of metropolitan development (density, urbanized land area, property value, and public expenditures on development) from 1982-1992 in 14 high-growth states (Carruthers and Ulfarsson, 2002). As the number of governments in a region increased, the likelihood of radiating, sporadic, and uncoordinated growth increased. Carruthers and Ulfarsson (2002, p. 313) concluded that the more inconsistencies and smaller the scope of growth management policies, the less likely the policies will attack the problems and the more likely the problems will merely shift to a surrounding locality.

Effects of Development Sprawl

The effects of development sprawl have received considerable attention by scholars. The positive effects of sprawl are largely embodied in the realization of short-term and long-term consumer preferences. The negative effects of sprawl are largely embodied in the long-term livability of communities.

Consumers

Although development sprawl stresses the environment and the ability of cities to provide services, it provides largely positive or neutral benefits for consumers of sprawling development. The literature shows that individuals that consume sprawling development are better able to realize preferences for single-family housing. Since sprawl increases the supply of housing¹¹, more individuals are able to benefit from the positive affects homeownership has on wealth,

¹¹ See, Heim, 2001, p. 246; Geddes, 1997, p. 40; U.S. Census Bureau 2001c.

psychological health, and community and political participation. Literature also provides limited evidence that sprawl results in reduced social ties and worker productivity.

Realization of Consumer Preferences

Positively, development sprawl is the result of consumer preferences for housing type and location at the best price. As discussed earlier in this chapter, multiple surveys reveal that most Americans prefer to live in single-family homes located in small communities near large cities (Baldassare, 1992; Orlebeke, 2002). In addition, Black (1996, p. 6) determined that the housing provided outside central cities is, all things being equal, 20 to 30% cheaper than within central cities. U.S. Census Bureau (2001a) data confirms the realization of this preference. Data shows that single-family housing is more plentiful outside large cities.

Residents also move outside city boundaries, because they are weary of government control. Carruthers and Ulfarsson (2002, p. 314) and Heim (2001, p. 246) found that many residents locate outside cities to escape city regulations and taxes. Sprawling development in areas outlying city boundaries, consequently, satisfies consumer preferences.

Wealth

A home is a source of wealth creation. Balfour and Smith (1996, p. 175) and Stewart (2003, p. 2) found that a home is a major asset that can appreciate in value overtime and serves as a sound investment. Rohe and Van Zandt (2002, p. 54) argue that the accumulation of wealth through the appreciation of a house price is the main financial benefit of homeownership. Between 1987 and 1997 a suburban homeowner in the United States enjoyed a 40% increase in their house price, while a city homeowner enjoyed a 35% increase in their house price (Rohe & Van Zandt, 2002, p. 54).

In addition, this increase in wealth can be used to finance education, job training, or small businesses. For example, in 2001, Americans withdrew \$80 billion in equity wealth out of homes to finance various endeavors (Rohe & Van Zandt, 2002, p. 54).

Psychological Health

Research also shows that homeownership contributes to the psychological health of homeowners. Material on Fannie Mae's Web site claims that a home is more than shelter or a good investment. A home is "a dream come true and symbolizes who we are" (Fannie Mae, 2003).

Rohe & Van Zandt (2002, p. 55) argue that homeownership is an integral part of the American Dream and is considered a right of passage symbolizing the achievement of a certain economic status. Since many Americans value homeownership, becoming a homeowner likely results in increased self esteem and life satisfaction (Rohe & Van Zandt, 2002, p. 55).

In a 1994 study, Rohe and Stegman found homeownership produced a significant increase in life satisfaction but not self esteem through a pretest-posttest design of low-income residents in Baltimore. They found that low-income homeowners were significantly more likely to be satisfied with life than low-income renters (Rohe & Stegman, 175-176). Rohe and Stegman (1994, p. 174) concluded that homeownership provides a benchmark of "making it" and instills a sense of control over one's life not felt by renters.

Unlike Rohe and Stegman, Balfour and Smith (1996, p. 175) found some evidence of a relationship between self esteem and homeownership in an analysis of U.S. General Social Survey data. They concluded that since buying a home is a complicated process, successful navigation brings self esteem. The degree to which self esteem increases, however, has yet to be successfully measured.

Community and Political Participation

Research shows that homeowners participate in community and political activities more than renters. Gilderbloom and Markham (1995, p. 1589) found a strong positive relationship between owning a home and voting. They claim that owning a home gives a worker a stake in the system and makes him or her more willing to participate in the political process.

DiPasquale and Glaeser (1999, pp. 354-356) examined U.S. General Social Survey data and also found a positive relationship between homeownership and voting as well as homeownership and membership in community organizations. Controlling for extraneous variables, a homeowner was more likely to vote in local elections and be a member of a community organization than a renter (DiPasquale & Glaeser, 1999, p. 356).

Rohe and Van Zandt (2002, p. 56) contributed the relationship between homeownership and community and political participation to tenure differences between homeowners and renters. Homeowners reside in a residence about ten years more than renters, consequently opportunities for participation in community and political affairs increases (Rohe & Van Zandt, 2002, p. 57). In addition, homeowners are likely to be more concerned about the quality of a neighborhood than renters, because the quality of the community is capitalized into the value of a home and the benefits of participation are felt over a longer period of time (Rohe & Van Zandt, 2002, p. 57).

Social Ties

There is some evidence that sprawl also affects neighborhood social ties. For example, Burchell et al. (1998, p. 86) and Ewing (1997, p. 117) argue that low-density development, which is synonymous with development sprawl, results in weak neighborhood social ties, because there is less opportunity for face-to-face interaction. In addition, Churchman (pp. 404-405) and Evans and Lepone (1992, pp. 172-173) argue that high-density development results in

weakened neighborhood social ties, because individuals withdraw psychologically and physically when they feel little control over their interactions with others.

Freeman (2001), however, failed to find a significant relationship between density and social ties but found a significant negative relationship between automobile dependency and social ties. Although not directly related to the pattern of sprawling development, development sprawl is associated with an increased dependence on automobile use. The regression analysis revealed that for every 1% increase in the proportion of residents that drive to work, there was a 73% decrease in the strength of social ties (Freeman, 2001, p. 74).

Labor Productivity

In addition to weakened social ties, there is some evidence sprawl negatively affects labor productivity. As reported by Dowling (2000, p. 876), a 1995 Bank of America report claimed that sprawl, among other things, decreases work productivity. Long work commutes contribute to frustration and absences, thus, reducing employee productivity (Dowling, 2000, p. 876). Reaching similar conclusions as the Bank of America report, Prud'homme and Lee (1999) found that increased distances between home and job negatively affect labor productivity in French cities.¹²

These two studies are worth mentioning in this review of scholarly literature, but should be reviewed with caution. Research on this issue is in its infancy, however, and it is not possible to generalize results of the two focused studies as overarching theories on development sprawl's affect on labor productivity.

¹² They examined labor productivity in 23 French cities of varying sizes.

Environment

Studies have examined the negative effects of development sprawl on the environment, which influence the long-term livability of communities. Most obvious is the destruction of open space and farmland. Less obvious are increased air pollution and the destruction of plant and animal habitats.

Open Space and Farmland

First and foremost, development consumes open space and farmland. This occurs, according to Daniels (2001, p. 234), because private markets' preference for low-density development persists at the detriment of the public's need for agriculture and open space. The end result based on Dowling's 2000 (p. 875) study is that development is consuming nearly one million acres of farmland a year. Leo and Beavis (1998, p. 201) explain that much of the converted farmland is highly productive land near cities.¹³

In addition, Leo and Beavis (1998, p. 201) claim that converted farmland negatively affects surrounding farmland. The "side effects" felt by the non-converted farmland include "nuisance conflicts, vandalism, higher land values and taxes, and diminished viability of local agricultural communities" (Leo and Beavis, 1998, p. 201).

Air Pollution

Sprawling development also affects the environment by indirectly contributing to air pollution. Although today's automobiles are 90% cleaner than cars in the 1970s, automobiles continue to pollute the air when operated (Dowling, 2000, p. 877). Leo and Beavis (1998, p. 195) and Stoel (1999, p. 9) reason that sprawl results in an increase in long automobile commutes, which pollute the air when operated (Leo & Beavis, 1998, p. 195; Stoel, 1999, p. 9). The longer commutes result in an increase in per car pollution.

Habitats for Plants and Animals

As open space is developed, ecosystems are also harmed. Leo and Beavis (1998, p. 195) claim development sprawl negatively affects habitats for plants and animals, because development destroys habitats.

City Finance and Service Provision

Another component to the livability of communities and the current study's first research purpose is the effects of development sprawl on city finance and service provision. The ability of a city to remain fiscally sound and provide adequate services affects the livability of a community. A review of the limited literature on the effects of development sprawl on city finance and service provision precedes the development of the hypotheses used to direct the subsequent empirical investigation.

The ability of a city to generate its own revenue is critical to a city's financial health. U.S. Census Bureau (2002) data for the 2000-01 fiscal year shows that total tax revenue amounted to 37% of total city revenue. The state-by-state amounts vary based on state policies regarding city revenue structures. For example, Texas cities, on average, receive 2% of annual revenue from state aid, making Texas cities more heavily dependent on local tax revenue than the national average (U.S. Census Bureau, 2000). The national average for state aid to cities is 17% (U.S. Census Bureau, 2002).

The ability to provide many public goods (ex: roads, police protection, and fire protection) depends upon local tax revenue. These public goods are provided not based on ability to pay but on need (Mikesell, 1999, pp. 2-3). Katz (2000, p. 28) reports that sprawl makes it difficult for police to respond to or deter crime. The average police response time has increased due to sprawling development (14 minutes), while most burglaries take three minutes.

¹³ Of the 460 million acres of farmland in the U.S., 58 percent is located in counties in or adjacent to urban areas.

In addition, when new development growth largely occurs outside a city's taxing authority, but residents of the new development growth uses the public goods, city services are stressed (Carr & Feiock, 2001, p. 259).

As a result of these research findings, the following overarching hypothesis for Research Purpose 1, which is to explore city managers' assessments of the effects of development sprawl on city finance and service provision, is developed:

Working Hypothesis 1:
Development sprawl negatively affects city finance and service provision.

Tax Base

Development sprawl negatively affects a city's tax base by effectively shrinking it. A typical city tax base consists primarily of sales tax and property tax revenue (Mikesell, 1999, pp. 354, 387). Table 2.1 shows 2000-01 fiscal year revenue for U.S. cities as reported by the U.S. Census Bureau (2002).

The U.S. Census Bureau (2002) reported that for fiscal year 2000-01, 19% of U.S. city revenue came from property taxes and 10% from sales taxes. Sales taxes are taxes on goods and services and can be general or selective in application (Mikesell, 1999, pp. 350-351). Property taxes are taxes on real or personal property (Mikesell, 1999, p. 387). Most property taxes apply only to real property (land and fixed improvements on land) (Mikesell, 1999, p. 389). Personal property includes all property that is not real (ex: machinery, stocks, bonds, automobiles, jewelry) (Mikesell, 1999, p. 389).

All 50 U.S. states authorize their cities to collect property taxes, and 33 U.S. states authorize their cities to collect sales taxes (Mikesell, 1999, p. 279). The tax revenue is used

primarily for general fund expenditures for a fiscal year or for securing and paying debt (Mikesell, 1993, p. 47).

Table 2.1: 2000-01 U.S. City Government Revenue Summary
(Dollar amounts are in millions.)

Description	Total Dollar Amount	Percentage
Revenue Total	\$376,690	100.0%
Intergovernmental revenue	\$85,316	22.6%
From federal government	\$14,262	3.8%
From state government	\$64,572	17.1%
From local government	\$6,482	1.7%
Taxes	\$137,769	36.6%
Property	\$72,854	19.3%
Sales	\$36,277	9.6%
Individual income	\$14,039	3.7%
Corporate income	\$3,609	1.0%
Motor vehicle license	\$511	0.1%
Other	\$10,479	2.8%
Charges	\$52,727	14.0%
Education	\$470	0.1%
Hospital	\$6,303	1.7%
Highways	\$1,239	0.3%
Airports	\$5,492	1.5%
Parking facilities	\$1,159	0.3%
Port facilities	\$811	0.2%
Parks and recreation	\$3,290	0.9%
Housing and community development	\$1,441	0.4%
Sewerage	\$18,171	4.8%
Solid Waste	\$6,006	1.6%
Other	\$8,345	2.2%
Misc. general revenue	\$30,899	8.2%
Utility revenue	\$54,771	14.5%
Water supply	\$20,098	5.3%
Electric power	\$27,866	7.4%
Gas supply	\$4,072	1.1%
Transit	\$2,735	0.7%
Liquor store revenue	\$394	0.1%
Insurance trust revenue	\$14,814	3.9%

Source: U.S. Census Bureau, 2002

A major function of city governments is the provision of critical services such as water, sewer, garbage, roads, police protection, fire protection, and ambulances (Mikesell, 1993, p. 45). The ability to provide these services is largely dependent on the size of the city's service base or tax base. Water, sewer, and garbage services are largely sustained by fees collected to provide the services and are referred to as enterprise services (Mikesell, 1999, p. 56). Roads, police protection, fire protection, and ambulance services are public goods, which are not delivered through a direct exchange of services received or ability to pay but are paid for by general tax revenue (Mikesell, 1999, pp. 3-5, 56).

Carr and Feiock (2001, p. 459) in a review of U.S. Census data found that most new development is sprawling development occurring outside city boundaries. Pagano (2002, p. 2) argues that revenue growth in cities largely depends on cities' ability to expand their tax bases. Consequently, if most new development growth is occurring outside city boundaries, cities' tax bases are unable to enjoy the added tax revenue from most new development without implementing means to incorporate that growth.

Further straining a city's tax base, Daniels (2001, p. 231) found after reviewing literature and state laws that sprawl results in central city disinvestment. Businesses within the central cities abandon or scale down establishments and chase growth. The result, according to Leo and Beavis (1998, p.186), is the tax base in central cities declines, and city property tax rates must increase to maintain the quality of city infrastructure and services.

Rybczynski and Linneman (1999) lend quantitative evidence to Daniels's (2001) and Leo and Beavis's (1998) claim of central city flight. Rybczynski and Linneman (1999, p. 35) found that many middle-income residents of central cities have moved to suburbs. They found that of the 77 largest cities in the United States, 26 were shrinking. These 26 shrinking cities scored

poorer on social welfare indicators (infant mortality, household income, welfare recipients, poverty, and unemployment) than the growing cities, because middle-income residents fled to the suburbs.

Based on these findings, the following relationship is expected:

Working Hypothesis 1a (WH1a):
Development sprawl negatively affects a city's tax base.

Services

As a result of an inadequate tax base, city services are stressed by development sprawl. As previously noted, many city services are provided through revenue generated through general taxes on residents (Mikesell, 1999, p. 2). Such services include public goods such as roads, police protection, and fire protection.

Speir and Stephenson (2002) conducted an empirical study on the effects of city service provision on the dispersion of development. They found that the more dispersed development is, the more costly it is to provide city services (Speir & Stephenson, 2002, p. 60).

Gurwitt (2000) interviewed city managers in California, Florida, and Ohio about development growth. The interviews revealed that development growth outside city boundaries strains city services. Gurwitt (2000, p. 38) argues that demands for city services such as roads and police and fire protection are the same whether a person lives within city boundaries or just outside city boundaries. He concluded that sprawling development outside city boundaries results in a demand for city services greater than the tax base can support (Gurwitt, 2000, p. 38).

Stoel (1999) arrived at similar conclusions after reviewing literature and city policies. Stoel (1999, p. 9) argues that services such as road infrastructure and police protection become

overloaded as residents in developments outside city boundaries rely on the services without paying the city property taxes used to deliver them (Stoel, 1999, p. 9).¹⁴

Since this study's first research purpose is to explore city managers' assessments of the effects of development sprawl on city finance and service provision, the summary of the limited existing research on the issue leads to the following expectation for the current study:

- Working Hypothesis 1b (WH1b):***
Development sprawl negatively affects city transportation infrastructure.
- Working Hypothesis 1c (WH1c):***
Development sprawl negatively affects city police and fire protection services.

Policy

Without careful government planning and regulations, many scholars and government officials argue that the negative effects of development sprawl will persist to the detriment of the livability of communities. This section examines the various programs employed by cities to manage the negative effects of sprawl. This section also includes the development and presentation of the working hypotheses for the second and third research purposes of this study, which are to explore city managers' assessments of the relationship between development sprawl and city annexation and to explore city managers' assessments the relationship between development sprawl and their impressions of regional governance.

Transportation Improvements

Transportation planning and funding is the product of federal, state, and local government policies. Cities across the United States implement a variety of transportation policies to manage traffic congestion, some of which is the result of automobile-dependent commutes.

¹⁴ For example, the speed on Los Angeles freeways is expected to decrease 11 miles per hour from 2000-2010, and Washington, D.C. area residents spend 67 hours each year in road traffic (Stoel, 1999, p. 9).

Cities expand and build roads to alleviate traffic congestion (Stoel, 1999, p. 10). This “solution,” however, only alleviates a symptom of sprawl and does not reduce sprawl according to Stoel (1999, p. 31).

Some studies also suggest that this relief is very temporary. The Smart Growth Network (2001, p. 62) cites that 60% to 90% of new road capacity is consumed within five years of opening of a major road. The group also argues that new and expanded transportation networks create “induced demand:” as large new roads are built, people increase their driving to take advantage of the new infrastructure (The Smart Growth Network, 2001, p. 62).

Cities also try to alleviate traffic congestion by providing alternatives to passenger-vehicle use by providing and/or encouraging transportation by mass transit, bicycle, or foot. Some cities, but more often special purpose taxing authorities, operate bus, light rail, commuter rail, and/or subway systems to reduce dependence on passenger vehicles (Schmitz, 2003, pp. 43-45). For example, a special purpose regional government serving the Chicago, Illinois area is financing and constructing a suburb-to-central city commuter rail system to decrease daily commutes by passenger vehicles (Gurwitt, 2003, pp. 36-37). Cities also provide ample sidewalks and bike lanes, adequate and attractive lighting, appealing landscapes, and buffers from traffic to encourage pedestrian and bike transportation (Schmitz, 2003, p. 24).

Development Control Planning

Beyond the reactive policies to ease transportation congestion associated with sprawling development, cities take active steps to control the pattern of development. Such development control policies include the infrequently used and controversial urban growth boundaries and the frequently used and less controversial planning ordinances.

Urban Growth Boundaries (UGBs)

Stoel (1999, p. 29) explains the rationale behind UGBs: if the area of development is limited, development becomes denser than without limits. As a result, open space will remain intact. Denser populations will decrease commute times, which will decrease automobile pollution. Compact development will also reduce the costs of providing public services.

Opponents to UGBs claim that the cost of housing within the city will artificially increase due to a limit of developable land and that work commutes are actually longer for many residents who cannot afford to live in the city and must buy or rent in areas beyond the no-build area (Stoel, 1999, p. 29). Phillips and Goodstein (2000, p. 337) examined this position in Portland, Oregon, a city that employs a UGB.¹⁵

Contrary to the expectation that housing prices would increase relative to non-UGB areas, the increase in the median price of a house between 1991 and 1996 was less than the national average for similarly sized and situated cities without UGBs. The median house value remained below the median price for similarly sized and situated cities. Phillips and Goodstein (2000, p. 341) suggest the increase in housing costs is primarily attributed to psychological forces rather than actual demand, because the growth boundary is adjusted every five years to maintain a surplus of developable land for a 20-year period.

Planning Ordinances

A less evasive and controversial technique employed by cities to manage land-use is planning. There are three broad types of city planning: comprehensive, zoning, and subdivision.

¹⁵ Six states authorize the use of UGBs: Oregon, Washington, Minnesota, Maryland, Tennessee and Maine (Knaap & Hopkins, 2001, p. 315).

Comprehensive Planning

A comprehensive plan is the core planning document and serves as a guide to zoning and subdivision regulations. It contains detailed, long-range plans for housing, business, transportation, public services, open-spaces, recreation, and natural resources and typically covers a period of 15 to 20 years (Toner et al., 1994, p. 6). Comprehensive plans contain maps and are filled with policy statements on planning matters. The plans typically review the current status of city planning and identify obstacles facing the community as well as espouse goals for neighborhoods, downtowns, industrial areas, roads, utilities, and parks (Toner et al., 1994, p. 6).

As an example, Table 2.2 provides the major elements of the comprehensive plan for Denver, Colorado. Denver’s comprehensive plan includes guiding principles and identifies challenges as well as sets long-term goals for the physical environment, human environment and local government cooperation.

Table 2.2: Sample Elements of a Comprehensive Plan – Denver, Colorado, 2000 (560,000 population)

Introduction
Vision
Guiding Principles
Key Issues and Challenges
Long-Term Physical Environment
Environmental Sustainability
Land Use
Mobility
Housing
Long-Term Human Environment
Economic Activity
Neighborhoods
Education
Human Services
Arts and Culture
Metropolitan Cooperation
Implementation
Appendix
List of Neighborhood and Sub-area Plans
Graphs and Tables of Denver City Attributes

Source: City of Arlington, Texas, 2000

Zoning

Zoning regulations are the key vehicle for implementing comprehensive plans. A zoning ordinance determines the allowable land uses in a community and controls some of the characteristics of those uses (Toner et al, 1994, p. 7). They are used to determine the location and type of new development, preserve the use of existing areas, and in some cases, change the use of existing areas.

State law authorizing zoning ordinances dates to the 1920s when the U.S. Department of Commerce developed model zoning enabling language for state governments (Johnson, Salkin, & Jordon, 2002, p. 20). Today, most cities across the United States regulate the type and use of development through zoning ordinances.

A zoning ordinance consists of a zoning map, which designates every parcel of land into a specific zoning district, as well as regulations for each zoning district. Basic zoning districts include residential, commercial, industrial, and agriculture (Toner et al, 1994, p. 7). More complex zoning districts are formed by breaking the basic districts into multiple districts (Toner et al, 1994, p. 7). For example, a city can have multiple residential districts each with different specifications. Zoning regulations can include specifications for lot size, setback requirements, side and rear yards, landscaping, construction materials, housing/building size, fencing, parking, and signage.

As an example, Table 2.3 provides the major elements of the zoning ordinance for Arlington, Texas. The zoning ordinance identifies zoning districts and boundaries as well as use regulations for the districts. The use regulations include requirements for building setback, building area, building design, fencing, landscaping, screening, parking, and signage.

As it relates more directly to development sprawl, cities adopt a number of regulations to encourage compact development and preserve open space. Daniels (2001, p. 231) found that

some city ordinances permit high-density, mixed-use development to encourage compact development and reduce automobile dependency. Many city planning policies according to Leo and Beavis (1998, p. 182) require developments to encourage pedestrian and bicycle use by providing bicycle lanes and ample sidewalks, while building compactly. Zoning controls can also protect open space and farmland by prohibiting residential, commercial, or industrial uses on designated land (Leo & Beavis, 1998, p. 182).

Table 2.3: Sample Elements of a Zoning Ordinance – Arlington, Texas, 2000 (350,370 population)

Title, Purpose and Intent, Applicability, Enforcement
Interpretations and Definitions
Decision-making and Administrative Bodies
Planning Documents
Development and Review Procedures
Zoning Districts, Boundaries, and Interpretation of District Regulations
Residential Zoning District Regulations
Nonresidential Zoning District Regulations
Special Purpose Zoning Regulations
Summary of Uses
Building Setback, Area, Bulk, and Design Requirements
Standards for Specific Uses
Residential Adjacency Standards and General Fence Requirements Landscape and Screening Standards
Off-street Parking and Loading Requirements
Sign Standards
Miscellaneous Provisions
Special Exceptions
Nonconforming Uses and Exempt Structures
Severability of Provisions

Source: City of Denver, Colorado, 2000

Subdivision Planning

Subdivision planning is another vehicle for realizing comprehensive plans. Subdivision ordinances guide the appearance of new developments by providing standards and a set of procedures for dividing land into separate parcels (Toner et al., 1994, p. 91). They secure the desired layout of new development as well as assure minimum public safety and amenity

standards. They can provide standards for lot shape, street and utility layout, lot number, lot size, lot location, drainages, and entrances and existing to roads (Toner et al., 1994, p. 91).

As an example, Table 2.4 provides the major elements of the subdivision ordinance for Ellsworth, Maine. The ordinance sets standards for street and storm water drainage design and construction standards as well as a map detailing how land is subdivided (platted). The city's subdivision ordinance requires a preliminary plat and final plat for large subdivisions but only a final plat for small subdivisions.

Table 2.4: Sample Elements of a Subdivision Ordinance – Ellsworth, Maine, 2002 (6,500 population)

Purposes
Authority and Administration
Definitions
Administrative Procedure
Pre-application
Subdivision of New and Existing Structures
Minor Subdivision
Preliminary Plat for Major Subdivision
Final Plat for Major Subdivision
Revisions to Approved Plans
Enforcement
General Standards
Street and Storm Drainage Design and Construction Standards
Performance Guarantees
Waivers
Appeals

Source: City of Ellsworth, Maine, 2002

Incentives

Beyond outright prohibitions and authorizations of certain developments, cities also enact policies that provide incentives for preferred growth. Cities encourage development by targeting areas within city limits for development through infill programs and tax structures.

Infill Programs

Development on land skipped over, underused, or abandoned is known as infill development (Schmitz, 2003, p. 40). Infill programs target new development in these areas. Development can be encouraged through a variety or combination of subsidies on development. Cities can provide rezoning of land uses, property tax breaks, desired utility or infrastructure improvements, and/or waive fees on building permits (Heim, 2001, p. 269; Schmitz, 2003, p. 40). Infill development encourages the utilization of developed areas, thus, reducing sprawl.

Brownfields are a special type of area targeted for infill development. They are environmentally-contaminated land previously used for industrial purposes (Kasper & Aumen, 2001, p. 30). Brownfield redevelopment programs provide financial assistance such as property tax breaks and/or environmental regulatory waivers for the redevelopment of contaminated industrial sites (Schmitz, 2003, p. 40). Contaminated sites can be very expensive to remediate and financial assistance or waivers is often necessary to entice developers to redevelop abandoned industrial sites. Brownfield redevelopment promotes active use of development land, thus, reducing the need to development undeveloped land.

Split Property Tax Rate

Some cities also have the authority to tax land at a rate higher than improvements (buildings).¹⁶ Gihring (1999, p. 64) reasons that taxing land at rates higher than improvements encourages the intensification of land uses, because it becomes more expensive to hold onto unproductive and undeveloped land.

Daniels (2001, p. 230) provides evidence that a split property tax rate increases building density. Pittsburgh, Ohio, which taxes land at a rate five times higher than improvements, was

¹⁶ Cities in Oregon, Washington, and Ohio currently have this authority (Girhing, 1999, p. 64; Daniels, 2001, p. 230).

one of only two cities that experienced growth in building activity from 1979-2000 in a study sample of fifteen Midwestern cities.

Disincentives

Cities also implement policies to discourage certain development patterns. Disincentives to development sprawl include impact fees and property tax exemptions.

Impact Fees

Impact fees are one-time charges designed to recover capital costs associated with city infrastructure expansion. They are structured to reflect differences in service costs by charging higher fees to users that are more costly to serve (Speir & Stephenson, 2002, p. 67). Speir and Stephenson (2002, pp. 60, 65) found in an analysis of development patterns that the greater the dispersion of development, the more expensive it is to extend water and sewer service infrastructure. Heim (2001, p. 269), however, argues that impact fees will alleviate the financial burden placed on city taxpayers to extend services to outlying areas, but are seldom high enough to discourage development sprawl.

Property Tax Exemptions

Instead of charging the developer the cost of extending utilities, some cities discourage owners of farmland and open spaces from developing land or selling land for development. Cities do this by offering property tax cuts or exemptions on these land uses within city limits (Daniels, 2001, p. 234). In theory, these property tax savings narrow the discrepancy in profitability between developed and undeveloped land, making development less attractive. In practice, however, Leo and Beavis (1998, p. 202) believe property tax exemptions fail to provide farmers financial compensation sufficient to prevent the selling of farmland to developers for large profits.

Preservation

Over the past 10 years, many cities have purchased open spaces outright through voter approved bonds to preserve open spaces (Stoel, 1999, p. 31).¹⁷ Purchasing development rights, however, is a cheaper tool used to preserve open space and retains private ownership. Under purchase of development rights (PDR) programs, owners of farmland or open spaces sell their rights to develop their land to a city or other entity operating the program in exchange for monetary compensation (Leo & Beavis, 1998, pp. 202-203).¹⁸

Leo and Beavis (1998, p. 203) point out two factors limiting the success of PDR programs. First, although the program's voluntary nature protects private property rights, it does so at the expense of participation. Second, although purchasing development rights is less expensive than the outright purchase of land, it requires substantial cash to attract participants.

Mega-Policies

All policies discussed above are limited by the implementation area. Growth does not occur neatly within the boundaries of one local jurisdiction, and piecemeal approaches to development sprawl may only shift the problem to a nearby community.¹⁹ Although operating officially under different governments, cities in metropolitan areas are often intimately enmeshed and "look" like one fluid urban area and suffer from similar problems. Of all development policies used by cities, annexation and regional governance are considered mega-policies, because both extend the implementation area of other development policies.²⁰

¹⁷ For example, in 1998, voters across the United States approved 70 percent of the 240 ballot items to purchase open spaces (Dowling, 2000, p. 877).

¹⁸ The first purchase of development rights programs began operating in the 1970s (Leo & Beavis, 1998, p. 203; Daniels, 2001, p. 235). In 1995, 14 states operated purchase of development rights programs and have saved over 400,000 acres of farmland and open spaces (Leo & Beavis, 1998, p. 203). By 1998, 15 states operated purchase of development rights programs, and have spent over \$900 million to preserve more than 500,000 acres of farmland and open spaces (Daniels, 2001, p. 235).

¹⁹ Daniels, 2001, p. 240; Johnson, Salkin, & Jordon, 2002, p. 25; Leo & Beavis, 1998, p. 190

²⁰ See, Daniels, 2001, p. 240; Leo & Beavis, 1998, p. 190.

These two mega-policies are the subject of this study's second and third research purposes: to explore the relationship between development sprawl and city annexation and to explore the relationship between development sprawl and city managers' impressions of regional governance. A review of the literature on the mega-policies and development of the hypotheses used to satisfy the research purposes follows.

Annexation

This section develops the expectations (working hypotheses) used to guide the empirical investigation associated with the exploration of city managers' assessments of the relationship between development sprawl and the frequency of city annexations (Research Purpose 2). There is limited scholarly research regarding attitudes about the impacts of city annexations. Most annexation documents are technical documents used to interpret or guide the implementation of the various states' annexation regulations.

Annexation is the process under which a city expands its boundaries by taking in (e.g., annexing) unincorporated areas into the city (Carr & Feiock, 2001, p. 459). During the 19th century, Frug (2002, p. 3) found that all major cities (Boston, New York, Philadelphia, Chicago, Pittsburgh, St. Louis, Cleveland, and Denver) grew by expanding their boundaries through annexation. During the 20th century, many major U.S. cities also annexed heavily to grow (Atlanta, Jacksonville, Oklahoma City, Houston, Dallas, San Antonio, Memphis, Nashville, Albuquerque, Phoenix, Los Angeles, San Diego, and San Jose) (Frug, 2002, p. 4). Popular sentiment against annexation by unincorporated areas proposed for annexation, however, began receiving great opposition in the late 20th century, and many states began restricting city authority by such means as requiring elections or the negotiation of service plans (Frug, 2002, p. 4).

Why Citizens Oppose Annexation

The literature shows that citizens proposed for city annexation often oppose the annexation for fear of a decreased quality of life. First and foremost, Conte (2001, p. 48) argues many residents choose to live outside city boundaries due to a distrust of city regulation of their property (Conte, 2001, p. 48). In addition, Conte (2001, p. 48) found that citizens oppose being annexed for fear that paying city taxes will not result in a net benefits in services provided. Frug (2002, p. 7) suggests that residents residing in development outside city boundaries often enjoy less crime, higher quality housing, better schools, and a higher quality of utility services than residents inside city limits.

City Authority to Annex

Every state in the U.S. provides for city annexation. Authority and the mechanisms provided, however, range from unilateral city authority to popular vote. Eight states, including Texas, allow for unilateral authority of cities to annex; two states provide for judicial determination of annexations; fourteen states provide for legislative determination of annexations; and twenty-six require local elections to adopt city annexation proposals (Liner & McGregor, 1996, p. 64). Of the five methods provided, Liner and McGregor (1996, p. 65) found that cities with unilateral annexation authority annex significantly more than cities required to hold elections.

Why Cities Annex

The literature shows that cities annex to alleviate the negative fiscal and service consequences of sprawling development outside city boundaries. As discussed earlier in this chapter, development sprawl results in a city tax base inadequate to support the demand for public services such as roads and police and fire protection. In addition, Feiock and Carr (2001,

p. 385) argue that annexation results in efficiency gains in collective needs for service delivery and community action.

Despite legal restrictions and citizen opposition, cities continue to annex to secure an adequate tax base for providing services. Liner and McGregor (1996, p. 57) concluded after reviewing literature and examining annexation policies in 659 U.S. cities that cities usually annex developed land. “Under the status quo, no development takes place and no annexation occurs. Development in the fringe areas of a municipality disturbs this equilibrium and activates forces which may lead to annexation” (Liner & McGregor, 1996, p. 57). This occurs, because cities are attempting to recapture or expand the city’s tax base (Liner & McGregor, 1996, p. 63).

In a 2001 study, Carr and Feiock found that most development growth today occurs in areas outside city boundaries, while cities retain most governmental authority to manage growth. They concluded that annexation is an effective tool cities use to “capture” sprawling growth so that it can be regulated (Carr & Feiock, 2001, p. 459).

Corroborating this finding, Carruthers and Ulfarsson (2002, p. 329) in an analysis of U.S. Census data found a statistically significant positive relationship the number of local governments in a geographic growth area, referred to as political fragmentation, and sprawl in the 14 most populous states in the U.S. Carruthers and Ulfarsson (2002, p. 355) concluded that annexation provides cities a tool to reduce political fragmentation, thus, reducing sprawl.

As a result of these research findings, it is expected that the detrimental effects of development sprawl result in cities annexing more frequently than they would otherwise in an effort to minimize or reverse the negative effects of sprawling development in the unincorporated areas surrounding cities. Thus, it is expected:

Working Hypothesis 2 (WH2):
Development sprawl positively affects the frequency of city annexations.

Working Hypothesis 2a (WH2a):
Development sprawl positively affects the frequency of city annexations over time.

Working Hypothesis 2b (WH2b):
Development sprawl positively affects the likelihood of future city annexations.

Regional Governance

Exploring the relationship between city managers' assessments of the level of development sprawl and their impressions of regional governance is the third research purpose. This section develops the expectations (working hypotheses) used to guide this research purpose. There is a large body of scholarly literature regarding the benefits of regional governance, but little research identifying the effect that development sprawl has on general impressions of regional governance by city employees.

William R. Dodge (1996, p. 38) provides a frequently used section of definitions pertaining to regionalism in *Regional Excellence: Governing Together to Compete Globally and Flourish Locally*. The definitions of region, governance, and regional governance are important to facilitating comprehension of the development of this section's working hypotheses.

[A region is] a central core city and its contiguous suburbs and future growth areas or a rural area that is commonly influenced or impacted by crosscutting economic, physical, and social development challenges.

[Governance refers to] all community interests affected by challenges and necessary to their resolution, not just governmental entities. Governance is the collaborative problem-solving mechanisms needed to design timely strategies as well as the government institutions and other service-delivery mechanisms needed to implement them.

[Regional governance is] the interactions of community officials and citizens, and the organizations they represent, as they design strategies for addressing challenges that cut across communities and deliver services for meeting common needs.

Support for Regional Governance

Scholars studying contemporary governmental challenges support regional approaches to governance. Regional problems associated with development sprawl emphasize the interconnectivity of a regional growth area. These areas, comprised of multiple local governments, collectively experience congested roads, uncontrolled growth in unincorporated areas, environmental pollution, and loss of open space (Dodge, 1996, p. 13). Since growth management problems occur regionally, many scholars contend the problems must be attacked regionally.²¹ Beverly Cigler (1998, p. 53) explains, “solutions must be sought on a regional basis, because problems spill over the boundaries of geographic-based local governments.”

Local governments, however, have historically supported regional governance sparingly and cautiously due a strong preference for local control. Regional areas are pulled apart by local officials’ allegiance to their individual cities and/or counties comprising the regions. Dodge (1996, p. 3) argues that multi-purpose, mandatory regional governance is often not realized due to fierce protection of local control.²²

There are four types of regional governance structures. Ranging from most common to least, there are regional associations, regional service-delivery groups, regional problem-solving

²¹ See, Baldassare & Hassol, 1996; Daniels, 2001, p. 240; Johnson, Salkin, & Jordon, 2002, p. 25; Leo & Beavis, 1998, p. 190

²² Only six states require regional growth planning: California, Florida, Michigan, Oregon, South Carolina, and Washington (Leo & Beavis, 1998, p. 190).

groups, and metro governments. Regional associations are informal or formal professional or community groups with no problem-solving or service authority (Dodge, 1996, p. 39). Regional service-delivery groups are formal entities that deliver or plan a special purpose and range from intergovernmental agreements to single-service planning and/or delivery groups (Dodge, 1996, p. 39). Regional problem-solving groups such as councils of governments exercise planning and policy development authority as formal entities and memberships consists of local governments (Dodge, 1996, p. 29). These groups focus on designing strategies to address regional challenges (Dodge, 1996, p. 29). Finally, metro-governments are general purpose units of government that conduct or guide all major regional decision-making (Dodge, 1996, p. 39).

Among the various types of regional governance structures, subject matter can vary widely based on the specific goals of the region. Governance authority can include any combination of the following areas: transportation, healthcare, emergency services, utility services, land-use planning, or economic development (Dodge, 1996, pp. 12-13).

In sum, support for regional governance can vary dependent on the intensity of regional problems and the intensity of value for local control. These regional groups can take a number of forms and address a number of issues. Thus, it is expected that:

***Working Hypothesis 3 (WH3):
Development sprawl results in varying support for regional governance.***

General Esteem for Regional Governance

The literature shows that general esteem for regional governance is positively affected by the level of development sprawl. Carruthers and Ulfarsson (2002, p. 320) concluded after finding a relationship between sprawl and political fragmentation²³ that regional approaches to

²³ Political fragmentation refers to the number of local governments (cities and counties) in a geographic growth area. The more the number of local governments, the higher the level of political fragmentation.

growth management eliminate the fragmentation of policies and in essence expand the implementation area of policies through coordinated local government efforts. In addition, the use of regional governance to control growth, although not widespread, is growing in popularity. Carruthers & Ulfarsson (2002, p. 312) contend that the suspected detrimental effects of development sprawl result in cities supporting regional governance more than they would otherwise, because city governments are more willing to compromise local autonomy in an effort to pursue the regional approach endorsed by scholars.

Baldassare and Hassol's 1996 survey of California city planners provides some empirical evidence supporting Carruthers and Ulfarsson's conclusions that there is growing support for regional governance. Since the overwhelming majority of California cities are in urban metropolitan areas, most survey respondents (city planners) represent urban and growing cities (Baldassare & Hassol, 1996, p. 24). The survey results showed that a majority (52%) of the 225 city planners who respond to the survey have a favorable opinion of regional governance in general (Baldassare & Hassol, 1996, p. 22).

Thus, for Research Purpose 3, which is to explore city managers' assessments of the relationship between development sprawl and their impressions of regional governance, it is also expected that:

Working Hypothesis 3a (WH3a):
Development sprawl positively affects general esteem for regional governance.

Support of Specific Areas of Regional Governance Planning

While development sprawl is expected to positively affect general esteem for regional governance, a review of scholarly literature shows development sprawl only positively affects support for certain specific areas of regional planning. Baldassare and Hassol (1996) surveyed

city planning directors in California to assess their perceptions and attitudes towards regional governance. A majority (55%) of respondents supported regional planning of transportation infrastructure (Baldassare & Hassol, 1996, p. 24). Few (17%) favored regional police and fire protection services planning (Baldassare & Hassol, 1996, p. 24). A minority (36%) favored a role for regional land-use planning (Baldassare & Hassol, 1996, p. 24).

Baldassare and Hassol (1996, p. 25) concluded that support for regional governance decreases as fears of loss of local autonomy increases. System-maintenance functions such as transportation infrastructure planning erodes local autonomy less than life-style services such as police and fire protection planning or local growth regulations such as land-use planning (Baldassare and Hassol, 1996, p. 25).

Gainsborough (2001) corroborates Baldassare and Hassol's 1996 survey findings after exploring regional cooperation in Houston and Los Angeles. Gainsborough (2001, p. 510) observed that city officials seldom support regional governance policies that override local policies. Since participation in regional governance in California and Texas are voluntary, complex and controversial issues such as land-use planning are unpopular topics for regional input (Gainsborough, 2001, p. 508).

Based on these findings regarding this study's third research purpose, to explore the relationship between city managers' assessments of the level of development sprawl and their impressions of regional governance, the final three working hypotheses are expected:

***Working Hypothesis 3b (WH3b):
Development sprawl positively affects support for regional
transportation infrastructure planning.***

***Working Hypothesis 3c (WH3c):
Development sprawl does not affect support for regional
police and fire protection services planning.***

***Working Hypothesis 3d (WH3d):
Development sprawl does not affect support for regional land-use planning.***

Summary of Conceptual Framework

A conceptual framework, according to Shields (1998, p. 206), provides the structure within which a researcher views, collects, and analyzes data. A conceptual framework focuses a researcher's endeavors in fulfilling research purposes.

Working hypotheses are the conceptual framework chosen for this exploratory study. As Shields (1998, p. 57) explains, working hypotheses serve as guides to early-stage investigations. The working hypotheses are not ends in themselves but means to greater understanding.

WH1: City Finance and Service Provision

The first purpose of the research study is to explore Texas city managers' assessments of the effects of development sprawl on city finance and service provision. It is expected based on scholarly literature that development sprawl negatively affects city finance and service provision by negatively impacting the potential growth of the a city's tax base, straining city transportation infrastructure, and straining city police and fire protection services. Table 2.5 shows the

connection between the working hypotheses and the literature sources for this first research purpose.

Table 2.5: Working Hypotheses for city finance and service provision

Research Purpose 1: Explore Texas city managers’ assessments of the effects of development sprawl on city finance and service provision.

Working Hypothesis	Source
WH1: Development sprawl negatively affects city finance and service provision.	Carr & Feiock, 2001; Katz, 2000; Mikesell, 1999; U.S. Census Bureau, 2001b; U.S. Census Bureau, 2002
WH1a: Development sprawl negatively affects a city’s tax base.	Carr & Feiock, 2001; Daniels, 2001; Leo & Beavis, 1998; Mikesell, 1993; Mikesell, 1999; Pagano, 2002; Rybczynski & Linneman, 1999; U.S. Census Bureau 2002
WH1b: Development sprawl negatively affects city transportation infrastructure.	Gurwitt, 2000; Mikesell, 1999; Speir & Stephenson, 2002; Stoel, 1999
WH1c: Development sprawl negatively affects city police and fire protection services.	Gurwitt, 2000; Mikesell, 1999; Speir & Stephenson, 2002; Stoel, 1999

WH2: Frequency of Annexations

The second purpose of the research study is to explore Texas city managers’ assessments of the relationship between development sprawl and city annexation. Scholarly literature leads to the expectation that development sprawl increases the frequency of city annexations due to the desire to capture a sprawling tax base. The connection between the working hypotheses and the literature sources for this second research purpose is provided in Table 2.6.

Table 2.6: Working Hypotheses for Frequency of Annexations

Research Purpose 2: Explore Texas city managers’ assessments of the relationship between development sprawl and city annexation.

Working Hypothesis	Source
WH2: Development sprawl positively affects the frequency of city annexations.	Carr & Feiock, 2001; Carruthers & Ulfarsson, 2002; Liner & McGregor, 1996
WH2a: Development sprawl positively affects the frequency of city annexations over time.	Carr & Feiock, 2001; Carruthers & Ulfarsson, 2002; Liner & McGregor, 1996
WH2b: Development sprawl positively affects the likelihood of future city annexations.	Carr & Feiock, 2001; Carruthers & Ulfarsson, 2002; Liner & McGregor, 1996

WH3: City Managers’ Impressions of Regional Governance

The third purpose of this research study is to explore Texas city managers’ assessments of the relationship between development sprawl and their impressions of regional governance. Existing research shows that city officials exhibit varying degrees of support for regional governance. Since development sprawl has a regional impact, it is expected that the more heavily a city is suffering from the effects of development sprawl, the more likely the city will support regional governance in general and transportation infrastructure planning specifically. The literature also leads to the expectation that due to the high value placed on local control of police and fire protection services and land-use planning, development sprawl will not influence support for regional governance in these areas. Table 2.7 shows the connection between the working hypotheses and the literature sources for this third research purpose.

Table 2.7: Working Hypotheses for City Managers’ Impressions of Regional Governance

Research Purpose 3: Explore Texas city managers’ assessments of the relationship between development sprawl and their impressions of voluntary regional governance.

Working Hypothesis	Source
WH3: Development sprawl results in varying support for regional governance.	Cigler, 1998; Dodge, 1996; Leo & Beavis, 1998
WH3a: Development sprawl positively affects general esteem for regional governance.	Baldassare & Hassol, 1996; Carruthers & Ulfarsson, 2002
WH3b: Development sprawl positively affects support for regional transportation infrastructure planning.	Baldassare & Hassol, 1996; Gainsborough, 2001
WH3c: Development sprawl does not affect support for regional police and fire protection services planning.	Baldassare & Hassol, 1996; Gainsborough, 2001
WH3d: Development sprawl does not affect support for regional land-use planning.	Baldassare & Hassol, 1996; Gainsborough, 2001

Chapter Summary

The review of scholarly literature captures the broad body of discourse on development sprawl’s causes, effects, and cures. Development sprawl’s origins and persistence are attributed to the economic mechanisms and interplay of supply, demand, and government policy.

The effects of sprawl, some positive, some negative, are felt by those residing in sprawling development, the environment, and government finance and service provision. Although the effects of sprawl have been the subject of numerous studies, little empirical investigations have examined the effects of sprawl on city tax bases, police and fire services, and transportation infrastructure. Consequently, WH1 and its sub-working hypotheses are developed as shown in Figure 2.5.

City policies used to control sprawl and its negative consequences have received ample attention in scholarly literature, but little research has sought to determine the link between

development sprawl and annexation policies as well as development sprawl and attitudes towards regional governance. Consequently, WH2 and its sub-working hypotheses and WH3 and its sub-working hypotheses were developed to further this area of research as shown in Figures 2.6 and 2.7.

The next chapter guided the operationalization of the working hypotheses. Since this study's geographic setting is Texas, the next chapter discusses the state's legal and demographic setting. By taking into consideration the study's setting, the formulation of the survey instrument used to test the working hypotheses is constructed in a coherent and relevant manner.

Chapter III: Demographic and Legal Setting

Chapter Purpose

Since the current study focuses on Texas and its cities, this chapter provides an overview of development patterns in Texas and the governance structure of its cities. The state's population and housing characteristics are discussed to show state development patterns. In addition, Texas state laws governing city powers are discussed to show the parameters within which cities develop policy. The information provided in this chapter is critical, because it helps guide the operationalization of the conceptual framework and reflections on research findings.

Demographic Setting

Texas's population is large and growing. The following discussion presents the demographic setting of Texas by describing its current population and distribution, its growth rate, and housing characteristics.

Current Population and Distribution

Texas is the second most populated state in the United States, behind California, and second to Alaska in land mass. Most of this population is located in metropolitan areas. The U.S. Census Bureau (2003c) has designated 23 metropolitan areas in Texas. The bureau defines a metropolitan area as containing "a large population nucleus, together with adjacent communities having a high degree of social and economic integration with that core." Combined, these areas comprise 84% of the state's total population of 20,851,820 (U.S. Census Bureau, 2003c). Table 3.1 provides a list of the 23 metropolitan areas.

Growth Rate

Texas is not only greatly populated, it is growing fast. From 1990 to 2000, Texas was the second fastest growing state in terms of total population growth (3,865,310) behind California

and eighth in percent increased (22.8%) (U.S. Census Bureau, 2001b, p. 2). Of the fastest growing metropolitan areas from 1990 to 2000, one Texas metropolitan area ranked 10th in total population growth (Dallas-Forth Worth-Arlington, at 1.2 million) (U.S. Census Bureau, 2001b, p. 6). Three Texas metropolitan areas, McAllen-Edinburg, Austin-San Marcos, and Laredo, experienced a population increase of over 44% during the 1990s (U.S. Census Bureau, 2001b, p. 6).

Table 3.1: Texas Metropolitan Areas

Abilene	Longview
Amarillo	Lubbock
Austin-San Marcos	McAllen-Edinburg-Pharr
Beaumont-Port Arthur	Midland
Brownsville-Harlingen	Odessa
College Station-Bryan	San Angelo
Corpus Christi	San Antonio
Dallas-Fort Worth-Arlington	Sherman-Denison
El Paso	Texarkana
Houston-Baytown-Sugar Land	Tyler
Killeen-Temple-Fort Hood	Wichita Falls
Laredo	

Source: U.S. Census Bureau, 2003c

Housing

As with population, Texas ranks second to California in total housing units. The U.S. Census Bureau (2003b) estimates that Texas had an estimated 8,502,060 housing units as of July 1, 2002, which was a 4.2% increase from April 1, 2000 figures. This percent increase was the 9th largest in the U.S. Of the 100 fastest growing counties for housing units from April 1, 2000 to July 1, 2002, 7 were from Texas (Rockwall, 7th at 17.3%; Williamson, 15th at 14.7%; Collin, 26th

at 12.1%; Denton, 51st at 10.2%, Hays, 54th at 10.1%; Montgomery, 79th at 8.9%; and Travis, 99th at 8.2%) (U.S. Census Bureau, 2003b).²⁴

The growth experienced during the 1990s is not expected to slow down. By 2025, Texas is projected increase in population by 30% to 27,183,000 (U.S. Census Bureau, 1994). The next section discusses the legal framework that this growth is regulated under.

Legal Setting

Texas state law provides for the creation of Texas cities and grants cities the authority to govern inhabitants. According to the 2002 U.S. Census of Governments, there are 1,196 cities in Texas (U.S. Census Bureau, 2003a, pp. 3-6).²⁵ Table 3.2 presents a distribution of Texas city populations. The table shows that the vast majority of Texas cities (91%) are under 10,000 in population, and only a very small percentage (3%) are over 100,000. The remainder of this section describes the legal constraints placed on these cities by state law.

Table 3.2: Distribution of Texas City Populations

Population Range	Number of Cities
300,000 or more	7
200,000 – 299,999	13
100,000 – 199,999	14
50,000 – 99,999	23
25,000 – 49,999	46
10,000 – 24,999	94
5,000 – 9,999	118
2,500 – 4,999	164
1,000 – 2,499	290
Less than 1,000	427

Source: U.S. Census Bureau, 2002, p. 9

²⁴ No state level data exists on the distribution of housing between city and unincorporated areas.

²⁵ There are 254 counties, 1,089 school districts, and 2,245 special districts in Texas as well.

Forms of City Government

Of the near 1,200 cities in Texas, there are two main forms: home rule and general law.²⁶

Their names give clues to their governing authority.

Home Rule

Home rule cities are granted the authority to do those things not specifically prohibited by state law. Approximately 25% of Texas cities are home rule (TML, 2003b, p. 8). To become a home rule city, a city must be at least 5,000 in population and adopt a governing charter “constitution” by election (TEX. CONST. Art. XI, § 5). Charter provisions cannot conflict with state or federal law. Table 3.3 provides the major sections of a typical Texas charter. As the table demonstrates, charter provisions establish the city’s governmental authority, form of government, qualifications and duties of elected and chief appointed officials, and election procedures.

Table 3.3: Typical City Charter Provisions

Description of the city’s governmental and propriety powers
Provisions establishing the city’s form of government (mayor-council or council-manager) and its legislative and judiciary machinery
Organization provisions establishing the administrative structure of the city government and the means for financing its operations
Provisions governing the procedures of the city council and advisory boards and commissions, and procedures for granting franchises, assessing and collecting taxes, and conducting annexations
Popular controls over the city government, such as elections, referenda, initiative and recall
Provisions relating to procedures for amending the charter

Source: Texas Municipal League, 2003b, p. 10

Of the state’s 312 home rule cities, nearly 87% (249) have adopted the council-manager form of city government (Texas Municipal League, 2003b, p. 10). Under the council-manager

form, the council, which is the elected governing body, serves as the legislative body, sets priorities, and is the final authority on all major policy decisions (Texas Municipal League, 2003b, p. 10). The members of the council have no administrative duties and appoint a city manager to serve as the chief operating officer (Texas Municipal League, 2003b, p. 11).

Table 3.4 outlines the typical duties of a city manager. As chief operating officer, the city manager, supervises all municipal employees and programs and oversees the preparation of the city budget. The manager also serves as a policy advisor to the city council.

Table 3.4: Typical Duties of a City Manager

Enforce all city ordinances, rules, and regulations.
Supervise all municipal employees and programs.
Prepare and execute the city's annual budget pursuant to the revenue and expenditure plans adopted by the council.
Manage the city's funds and prepare periodic reports that advise the council and the general public of the city's fiscal condition.
Provide information to the council to facilitate its ability to make informed decisions in the best interests of the community.
Prepare council meeting agendas and attend all such meetings to serve as a resource to the council and the public.
Draw the council's attention to community needs and recommend alternatives by which the council can respond to those needs.

Source: Texas Municipal League, 2003b, p. 11

The other form of government comprising the remaining 13% of Texas home rule cities is the mayor-council form. In this arrangement, the mayor and in some cases, the entire council, share the administrative duties of the city (Texas Municipal League, 2003b, p. 10).

²⁶ The state makes no distinction between cities, towns and villages: all are legally cities.

General Law

General law cities can be any size, although virtually all cities over 5,000 have adopted home rule charters (Texas Municipal League, 2003a, p. 8). General law cities, unlike home rule cities, can only do those things specifically granted by state or federal law (Texas Municipal League, 2003a, p. 8).

A general law city's form of government is established by state law. There are three categories of general law cities, each with variations of government form and authority. Each type of general law city, termed Type A, Type B, and Type C, consists of an elected governing body with administrative authority (TEX. LOC. GOV'T CODE ANN. Ch. 21, 22 & 23). The administrative duties in these cities can be given to a city manager (sometimes referred to as a city administrator) through a local election or simple governing body vote (TEX. LOC. GOV'T CODE ANN. Ch. 25). The typical duties of a city manager in a general law city are the same as in a home rule city and are described in Table 3.3 (Texas Municipal League, 2003a, p. 9).

City Tax Authority

The Texas state legislature has granted cities broad taxing authority to remain financially solvent. The two primary sources of city revenue come from local sales and property taxes. Cities are authorized to collect a one-percent general sales tax, and a variety of special use sales taxes, which can be used for economic development, property tax relief, and transportation. (TEX. TAX CODE ANN. Ch. 221, 313 & 327).²⁷

Depending on the size and type of the city, maximum property tax rates range from \$.25 per \$100 in assessed value to \$2.50 per \$100 in assessed value (TEX. CONST. Art. 11, §§ 4 & 5; TEX. TAX CODE ANN. § 302.001; TEX. LOC. GOV'T CODE ANN. §§ 51.051(a), 51.051(b)

²⁷ Collectively, city sales taxes and other local taxes administered by county and special districts can not exceed two percent (TEX. TAX CODE ANN. Ch. 221, 313, & 327).

& 51.052). Table 3.4 provides a breakdown of the maximum allowable property tax rates for Texas cities.

Table 3.4: Maximum Property Tax Rates for Texas Cities

<p>Home Rule and Type A General Law Cities 5,000 inhabitants or more: \$2.50 per \$100 in assessed value 4,999 inhabitants or less: \$1.50 per \$100 in assessed value</p> <p>Type B General Law \$.25 per \$100 in assessed value</p> <p>Type C General Law 5,000 inhabitants or more: \$2.50 per \$100 in assessed value 501 to 4,999 inhabitants: \$1.50 per \$100 in assessed value 500 inhabitants or less: \$.25 per \$100 in assessed value</p>

Source: TEX. CONST. Art. 11, §§ 4 & 5; TEX. TAX CODE ANN. § 302.001; TEX. LOC. GOV'T CODE ANN. §§ 51.051(a), 51.051(b) & 51.052

City Development Control Authority

Neither state law nor state directives address development sprawl explicitly. State law does, however, grant cities broad authority to manage the pattern and use of development. This authority, however, is increasingly threatened in the state legislature.

State law provides cities the authority to adopt comprehensive plans, zoning ordinances, subdivision ordinances, impact fees, tax incentives for targeted growth as well as conduct annexations and participate in regional governance (TEX. LOC. GOV'T CODE ANN. Ch. 43, 211, 213, 391 & 395; TEX. TAX CODE ANN. Ch. 311-312). The state does not permit urban growth boundaries or split property tax rates nor operate a purchase of development rights program. The remainder of this section examines in further detail the two mega-policies, which are the focus of the original research: annexation and regional governance.

Annexation

Texas law grants all Texas cities annexation authority.²⁸ Both home rule and general law cities have the power to annex on petition of the landowners (TEX. LOC. GOV'T CODE ANN. Ch. 43). In addition, both types of cities have the authority to annex without consent of landowners, which is referred to as unilateral authority. This unilateral authority, however, differs greatly between home rule and general law cities.

Home rule cities have broad unilateral annexation authority. Home rule cities have the authority to annex without the consent of the landowner if the land is contiguous to city limits and completely within the city's extra-territorial jurisdiction (ETJ) (TEX. LOC. GOV'T CODE ANN. §§ 43.051 & 43.054). The ETJ of a city is the land surrounding city limits that is not within the jurisdiction of another city. Depending on the size of the city, the ETJ ranges from one-half mile to five miles (TEX. LOC. GOV'T CODE ANN. § 42.021). General law cities can only annex territory unilaterally if the land is contiguous, in the city's ETJ, **and** the city provides sewer or water to the area (TEX. LOC. GOV'T CODE ANN. §§ 43.024, 43.025 & 43.033).

No matter who initiates the annexation, all cities must hold two public hearing on the proposed annexation and provide a service plan for the delivery of city services (TEX. LOC. GOV'T CODE ANN. § 46.063(a)). Very large annexations, those containing over 100 tracts of land with one or more residential dwelling on each tract, have a higher threshold of city obligations, including the negotiation of the service plan and a three-year notice of the initiation of annexation proceedings (TEX. LOC. GOV'T CODE ANN. Subchapter C).

²⁸This authority, although still broad, has been restricted in recent years. See, S.B. 89, 76th (1999) Legislature; TEX. LOC. GOV'T CODE ANN., Ch. 43 (Vernon 1999 & Supp. 2003).

Regional Governance

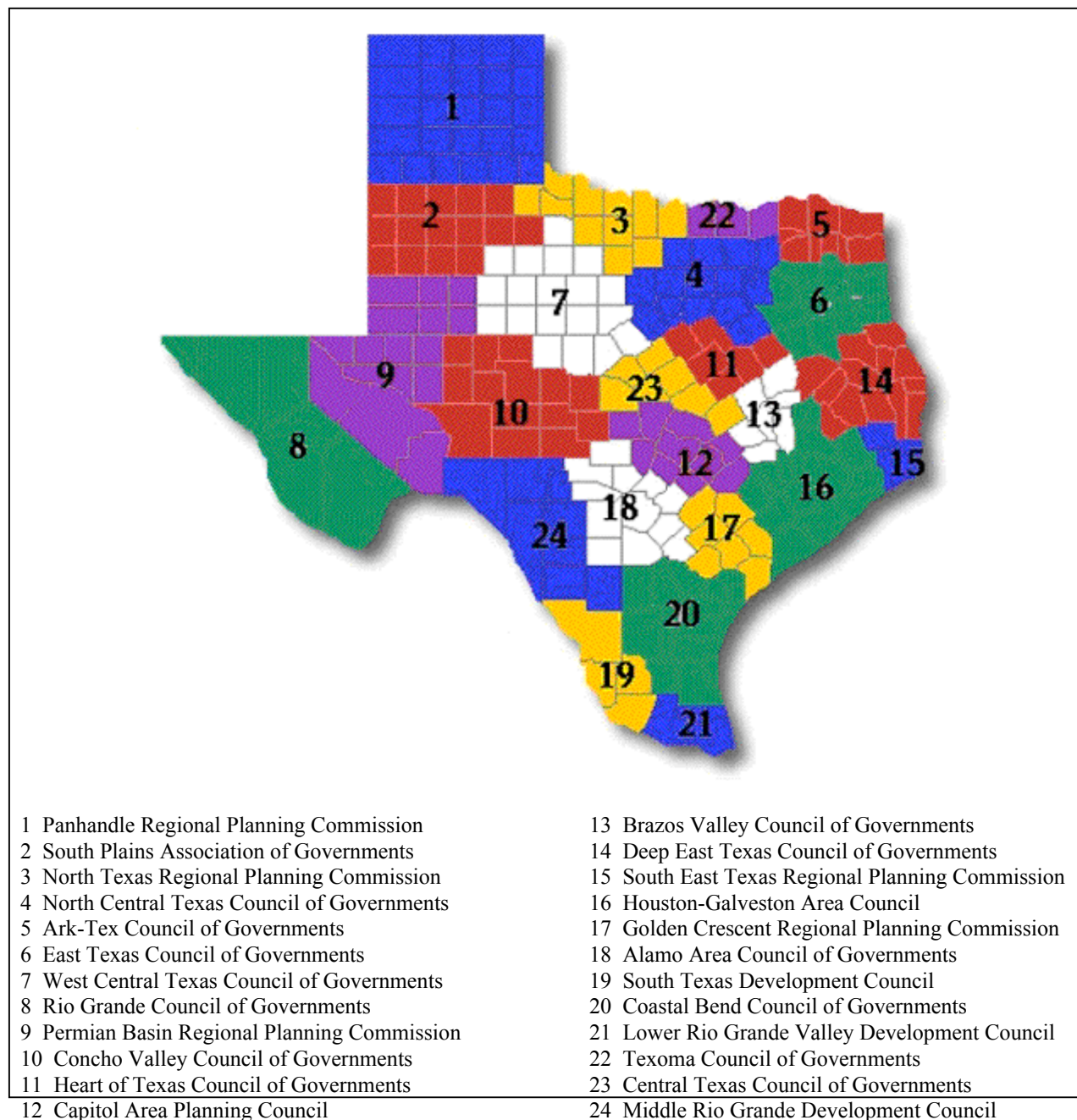
Texas state law provides for 24 Council of Governments (COGs), which are referred to by a variety of names: regional councils, regional planning commissions, area councils, or association of governments (TEX. LOC. GOV'T CODE ANN. § 391.003b; Texas Association of Regional Councils, 2003). Figure 3.1 shows the location and names of the 24 COG regions.

COGs are defined by law as political subdivisions of the state but have no regulatory powers (TEX. LOC. GOV'T CODE ANN. §§ 391.003c, 391.004 & 391.005). Membership in COGs is voluntary and consists of local government officials and affiliated organizations (TEX. LOC. GOV'T CODE ANN. § 391.006). State law vests COGs with the following authority (TEX. LOC. GOV'T CODE ANN. §§ 391.004, 391.005):

- plan for the development of a region and make recommendations concerning major thoroughfares, streets, traffic and transportation studies, bridges, airports, parks, recreation sites, school sites, public utilities, land use, water supply, sanitation facilities, drainage, public buildings, population density, open spaces, and other items relating to the commission's general purposes;
- contract with a participating governmental unit to perform a service;
- purchase, lease, or otherwise acquire property; and
- hold or sell or otherwise dispose of property.

Each COG adopts its own bylaws, but state law requires membership be at least two-thirds local elected officials (TEX. LOC. GOV'T ANN. § 391.006). Each COG employs a full-time professional staff, which is headed by an executive director (Texas Association of Regional Councils, 2003). Typical staff positions include a director of regional planning, a fiscal officer, a regional services coordinator, and planners for each program implemented (Texas Association of Regional Councils, 2003).

Figure 3.1: Texas COG Regions



Source: Texas Association of Regional Councils, 2003

COGs operate programs in a variety of areas, including: aging, community development, criminal justice, economic development, emergency communications, employment and training, health, solid waste management, transportation, water quality management planning, and

innovative programs (Texas Association of Regional Councils, 2003). Funding for COGs comes primarily through local dues and state grants (Texas Association of Regional Councils, 2003). COGs, however, do receive some revenue from federal grants and private donations (Texas Association of Regional Councils, 2003).

Aside from COGs, there are a number of non-state created regional groups ranging from regional associations of mayors to multi-county planning groups. For example, Travis county mayors meet monthly to discuss local challenges and problem-solving initiatives. Although regional governance groups vary widely in Texas, the commonality that exists amongst all is their voluntary nature.

County Development Control Authority

The 254 county governments in Texas as a rule have very limited development control authority. With few exceptions the only development authority counties have is the platting of subdivisions and the ability to participate in regional governance (TEX. LOC. GOV'T CODE ANN. Ch. 232 & 391). A handful of counties have limited zoning authority for designated purposes such as zoning around certain lakes or coastal areas (TEX. LOC. GOV'T CODE ANN. Ch. 231).

Chapter Summary

There are five important findings from this chapter. First, Texas is a rapidly growing state with 23 major urban areas. State and local governments are and have been experiencing substantial population growth. The ability to absorb this growth and the pattern of this growth could affect the financial health and livability of cities.

Second, city annexations capture local property and sales tax revenue. This is important, because local property tax and sales tax revenue are the primary source of revenue for Texas cities.

Third, since counties have limited development control authority, development outside city boundaries is subject to little regulation. Consequently, the importance of city annexation is intensified by the perceived need to regulate the pattern, type, and use of development.

Fourth, the differences between home rule and general law annexation and tax authority is extreme. Home rule cities have broad unilateral annexation authority, while general law cities have very limited annexation authority. Cities under 5,000, the vast majority of which are general law cities, have a maximum property tax rate that at a minimum is one dollar less than cities over 5,000, which are primarily home rule cities.

Fifth, the type of regional governance authorized by state law is voluntary regional councils (COGs). State law does not mandate participation in regional governance and leaves it to each COG to set its by-laws. Consequently, COGs in Texas vary widely in participation and planning activities.

These findings are important as a matter of reference and more importantly for developing the survey instrument and analyzing survey data. The next chapter explains the very deliberate process of the survey design and implementation process.

Chapter IV: Methodology

Chapter Purpose

This chapter is the heart of the research study. This chapter operationalizes the three working hypotheses (conceptual framework) presented in Chapter II with consideration of the demographic and legal setting discussed in Chapter III.

Tables 4.1, 4.2, and 4.3 show how each of the three working hypotheses (WH1, WH2, and WH3) is operationalized into survey questions with measurable response categories. WH1 has three sub-working hypotheses, each with an independent and dependent variable. WH2 has two sub-working hypotheses, each with an independent and dependent variable. WH3 has four sub-working hypotheses, each with an independent and dependent variable. Each variable is measured by one survey question. The tables also provide response categories and codes, if any, for each survey item. The remainder of the methodology section contains a discussion and justification of the operationalization tables.

Research Technique

Survey research was selected as the research technique, because it was the best fit for the study's exploratory research purposes. The survey, which was developed within the skeleton of the conceptual framework, allowed for the collection of large amounts of data that was later analyzed to test each working hypothesis.

As Salant and Dillman (1994, p. 9) point out, a major strength of survey research is its unobtrusive nature. Respondents can complete surveys at their leisure (Salant & Dillman, 1994, p. 9). Babbie (2001, p.269) adds that survey research is associated with high reliability due to a stable research format, the questionnaire, which can collect information efficiently from numerous subjects.

Although associated with high reliability of results, survey research is susceptible to challenges of validity. Babbie (2001, p. 225) explains that poor participation in the survey instrument by subjects may result in data unrepresentative of the population. Further weakening validity, Salant and Dillman (1994, pp. 13-5) explain that response scales may not be exhaustive and exclusive, survey questions may be biased, and survey questions may not fully assess the topic of inquiry. Babbie (2001, p. 269) also warns that survey results are subject to challenges of validity, because surveys rely on people to recall actions and or assess opinions.

To combat weaknesses inherent in survey research, three actions were taken. First, to prevent poor survey participation, the author sent a second request for survey completion to those who do not return the surveys by the initial due date (Babbie 2001, p. 225). Second, the survey instrument was pretested to address biased questions or incomplete response scales by three individuals with extensive experience with municipal government: one current city manager and two employees of the Texas Municipal League. Finally, the selection of the city manager as the survey recipient minimizes recall error, because he or she serves as the technical expert and policy advisor to the city's policy decision-making body, the city council (DeSantis & Leal, 1998; Wheeland, 1994).

Although it is preferable to have multiple sources of data to corroborate findings (Yin, 1994, p. 92), time and financial limitations did not permit a more in-depth exploratory study. In addition, by definition, exploratory research addresses a research topic in its early stages (Shields, 1998, p. 57). The current study lays the foundation for future studies regarding development sprawl in Texas but does not provide a definitive assessment on the topic.

Attachment A contains a copy of the eleven-question survey instrument. When possible, the surveys were e-mailed. If an e-mail address could not be located, the survey was sent by regular mail.

Table 4.1: Operationalization of the Conceptual Framework for Research Purpose 1

Research Purpose 1: Explore Texas city managers' assessments of the effects of development sprawl on city finance and service provision.			
Working Hypothesis 1: Development sprawl negatively affects city finance and service provision.			
Variable	Hypothesis number	Hypothesis Direction	Questionnaire Item
Dependent Variable 1: Tax base adequacy	WH1a		7. The city's tax base is adequate.*
Dependent Variable 2: Transportation infrastructure adequacy	WH1b		5. The city's transportation infrastructure is adequate.*
Dependent Variable 3: Police and fire protection services adequacy	WH1c		6. The city's police and fire protection services are adequate.*
Independent Variable 1: Current level of development sprawl	WH1a	negative	2. Currently, the amount of development in the unincorporated areas surrounding the city limits is **
	WH1b	negative	
	WH1c	negative	

Response Scales and Codes

*		**	
Strongly Agree	5	Very High	5
Agree	4	High	4
Neutral	3	Moderate	3
Disagree	2	Low	2
Strongly Disagree	1	Very Low	1
		N/A	Record thrown out

Table 4.2: Operationalization of the Conceptual Framework for Research Purpose 2

Research Purpose 2: Explore Texas city managers' assessments of the relationship between development sprawl and city annexation.			
Working Hypothesis 2: Development sprawl positively affects the frequency of city annexations.			
Variable	Hypothesis number	Hypothesis Direction	Questionnaire Item
Dependent Variable 1: Completed annexations	WH2a		3. In the blank space provided below, indicate the number of annexations the city completed in the past five years.
Dependent Variable 2: Future annexations	WH2b		4. In the blank space provided below, indicate the number of annexations the city will likely perform in the next five years.
Independent Variable 1: Level of development sprawl over time	WH2a	Positive	1. Over the past five years, the level of development in the unincorporated areas surrounding the city limits has *
Independent Variable 2: Current level of development sprawl	WH2b	Positive	2. Currently, the amount of development in the unincorporated areas surrounding the city limits is **

Response Scales and Codes

*

Greatly Increased	5
Increased	4
Remained the Same	3
Decreased	2
Greatly Decreased	1
N/A	Record thrown out

**

Very High	5
High	4
Moderate	3
Low	2
Very Low	1
N/A	Record thrown out

Table 4.3: Operationalization of the Conceptual Framework for Research Purpose 3

Research Purpose 3: Explore Texas city managers' assessments of the relationship between development sprawl and their impressions of regional governance.			
Working Hypothesis 3: Development sprawl results in varying levels of support for regional governance.			
Variable	Hypothesis number	Hypothesis Direction	Questionnaire Item
Dependent Variable 4: General impression of voluntary regional governance	WH3a		8. Generally speaking, my impression of voluntary regional governance is favorable.*
Dependent Variable 1: Support for voluntary regional transportation infrastructure planning	WH3b		9. Voluntary regional governmental entities should play a role in transportation infrastructure planning.*
Dependent Variable 2: Support for voluntary regional police and fire protection services planning	WH3c		10. Voluntary regional governmental entities should play a role in the provision of police and fire protection services planning.*
Dependent Variable 3: Support for voluntary regional land-use planning	WH3d		11. Voluntary regional governmental entities should play a role in land-use planning.*
Independent Variable 1: Current level of development sprawl	WH3a	positive	2. Currently, the amount of development in the unincorporated areas surrounding the city limits is **
	WH3b	positive	
	WH3c	no direction posited	
	WH3d	no direction posited	

Response Scales and Codes

**

Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

*

Very High	5
High	4
Moderate	3
Low	2
Very Low	1
N/A	Record thrown out

Unit of Analysis

The study's unit of analysis is city managers. City managers are surveyed, because scholarly literature clearly establishes city managers as key players in municipal governance.

A city manager is the chief appointed official of a city and is hired by the city council to manage all aspects of municipal operations (Thurmond, 2002, p. 19). The city manager serves as a technical expert on policy issues²⁹, recommends policy decisions to the city council³⁰, implements policy adopted by the city council³¹, and builds coalitions to champion policy³².

Population

The population for the study is Texas city managers. The sampling frame is the list of 540 Texas city managers maintained by the Texas Municipal League (TML), a non-profit organization representing Texas cities.³³ The list maintained by TML is the most complete and accurate existing list of the study population and is believed to contain all members of the study population.

Surveying the sampling frame is preferable to selecting a sample, because it more likely provides an accurate representation of the study population (Babbie, 2001, p. 178). In the current study, the sampling frame is a manageable size; therefore, all members were surveyed.

Statistics

Descriptive statistics summarize the survey data to provide an easily digestible snap shot of survey responses. The distribution of returned surveys among the types of cities and COG

²⁹ DeSantis & Leal, 1998; Wheeland, 1994

³⁰ DeSantis & Leal, 1998; Wheeland, 1994

³¹ Boynton & Wright, 1979; Newell & Ammons, 1987; Svara, 1985; Wheeland, 1994

³² DeSantis & Leal, 1998; Svara, 1985; Wheeland, 1994; Wikstrom, 1979

³³ Not all city governments in Texas employ city managers. Most cities without city managers are under 5,000 in population and duties regularly assigned to a city manager are dispersed among the governing body.

regions are provided. In addition, the means, modes, and standard deviations of responses for each survey item are calculated to describe the central tendencies and spread of responses.

Pearson's product-moment correlation (correlation), a type of inferential statistic, is performed to test support for each sub-working hypothesis of WH1, WH2, and WH3.

Correlation is the appropriate inferential test, because it "measures the strength and direction of the linear relationship between two quantitative variables" (Moore, 1995, p. 111). Each sub-working hypothesis in this study purports the presence or absence of a linear relationship and is coded when necessary for statistical applications. Tables 4.1, 4.2, and 4.3 provide the survey response codes necessary to perform the correlation tests.

Due to differences in fiscal and annexation authority between home rule and general law cities, correlations are calculated for each working hypothesis in three phases. Correlations are calculated for: (1) general law and home rule cities combined, (2) general law cities alone, and (3) home rule cities alone. Three separate analyses are necessary to identify any unique relationships amongst general law and home rule cities.

For WH1a, the correlation tests assess any relationship between observed differences in the current level of development sprawl and the adequacy of the city tax base. For WH1b, the tests assess any relationship between observed differences in the current level of development sprawl and the adequacy of transportation infrastructure. For WH1c, the tests assess any relationship between observed differences in the current level of development sprawl and the adequacy of police and fire protection services. If the results of all correlation tests show a positive or insignificant negative relationship between the variables, then the evidence will not support WH1. If the results of all correlation tests show a significant negative relationship

between the variables, then the evidence will support WH1. If the results are mixed, the evidence will partially support WH1.

For WH2a, the tests assess any relationship between observed differences in the level of development sprawl over time and the frequency of annexations over time. For WH2b, the tests assess any relationship between observed differences in the current level of development sprawl and the frequency of future annexations. If the results of all tests show a negative or insignificant positive relationship between the variables, then the evidence will not support WH2. If the results of all tests show a significant positive relationship between the variables, then the evidence will support WH2. If the results are mixed, the evidence will partially support WH2.

For WH3a, the tests assess any relationship between observed differences in current level of development sprawl and general impressions of voluntary regional governance. For WH3b, the tests assess any relationship between observed differences in the current level of development sprawl and support for regional transportation infrastructure planning. For WH3c, the tests assess any relationship between observed differences in the current level of development sprawl and support for regional police and fire protection services planning. For WH3d, the tests assess any relationship between observed differences in current level of development sprawl and support for regional land-use planning. If the results of all tests for WH3a and WH3b show a negative or insignificant positive relationship between the variables and the results of all tests for WH3c and WH3d show any significant relationship between the variables, then the evidence will not support WH3. If the results of all tests for WH3a and WH3b show a significant positive relationship between the variables and the results of all tests

for WH3c and WH3d show no significant relationship between the variables, then the evidence will support WH3. If the results are mixed, the evidence will partially support WH3.

The results of the correlation tests are tempered due to a weakness inherent in the test. Correlation only evaluates a relationship between the two variables tested; it does not account for variables outside the scope of the study that influence the outcomes of the studied variables (Moore, 1995, p. 143). Consequently, correlation does not imply causation. However, this weakness is adequately alleviated, because survey data is analyzed in the context of previous scholarly research findings and the descriptive statistics of the current study's survey data.

Chapter Summary

In summary, a survey, which was guided by the study's conceptual framework, was administered to city managers in Texas. In the following results chapter, data collected from the survey is described through descriptive statistics, and the working hypotheses are tested with the correlation statistic.

Chapter V: Results

Chapter Purpose

This chapter presents and analyzes the results of the survey instrument discussed in the previous chapter. The findings are used to assess support for each of the three overarching working hypotheses.

The statistical analysis, consisting of descriptive statistics and correlation coefficients, produce mixed results for each working hypothesis. There is limited evidence that development sprawl negatively affects city finance and service provision (WH1). There is stronger, but not conclusive evidence that development sprawl positively affects the frequency of city annexations (WH2) and city manager support for regional governance (WH3).

Description of Returned Surveys

Of the 540 surveys sent, 334 were returned for a response rate of 62%. The majority (56%) of surveys returned were from home rule cities. At least one survey was returned from each of the 24 COG regions, with the highest concentration being from regions 4 (Dallas-Fort Worth area) and 16 (Houston area).³⁴

Valid responses for each survey item ranged from 303 (56%) to 333 (62%). The two questions with the largest number of invalid responses were survey items measuring the level of development sprawl over time and the current level of development sprawl. The questions assessed the past and current level of development in the unincorporated areas surrounding the city's boundaries. Some cities do not have unincorporated areas surrounding their city boundaries; they are completely surrounded by incorporated cities. Thus, a N/A response code was necessary.

WH1: City Finance and Service Provision

The first purpose of this research study is to explore Texas city managers' assessments of the effects of development sprawl on city finance and service provision. An overarching hypothesis (WH1) postulated that development sprawl negatively affects city finance and service provision. To test this expectation, three sub-working hypotheses were developed. In the first (WH1a), a negative relationship between the current level of development sprawl and the adequacy of the tax base was anticipated. The second (WH1b) expected a negative relationship between the current level of development sprawl and the adequacy of transportation infrastructure. The third and final sub-working hypothesis (WH1c) anticipated a negative relationship between the current level of development sprawl and the adequacy of transportation infrastructure.

Table 5.1 contains the modes, means, standard deviations, and correlations for the variables tested in WH1. City managers most frequently reported a moderate level of development sprawl outside their city's boundaries (mean = 3.0, standard deviation = 1.1; mode = moderate (38% of responses)). The responses were fairly evenly distributed but leaned towards a moderate level of development sprawl. (In total just under one-third (32%) indicated a very low or low level of development sprawl, and slightly less than that (30%) indicated a high or very high level of development sprawl.)³⁵

Regarding tax base adequacy, the mean response was 2.9 (standard deviation = 1.2), while the mode was "disagree" (39% of responses). An examination of the response distribution shows that slightly more city managers felt their city's tax was inadequate than adequate. Forty percent of city managers reported that they strongly agreed or agreed their city's tax base was

³⁴ See Figure 3.1 for a geographic representation of the 24 COG regions and Appendix B for a comprehensive listing of survey completion by COG region.

adequate, while almost half (48%) reported that they strongly disagreed or disagreed with the statement. A neutral opinion was given by approximately 12%.

Table 5.1: Statistics for WH1: City Finance and Service Provision

Variable	Overall Mean & Mode	Overall Standard Deviation	Current Level of Development Sprawl		
			Overall Correlation Coefficient N=303 ^a	General Law Correlation Coefficient N=141	Home Rule Correlation Coefficient N=162 ^b
Current Level of Development Sprawl	3.0 Moderate	1.1	1	1	1
Tax Base Adequacy	2.9 Disagree	1.2	.13*	.07	.17*
Transportation Infrastructure Adequacy	3.1 Agree	1.2	-.12*	-.2*	.06
Fire Protection Services Adequacy	3.8 Agree	1.0	.03	.06	-.08

* significant at .05 level

a The actual number varied by variable between 303 and 305.

b The actual number varied by variable between 162 and 164.

The mean response for transportation infrastructure adequacy was 3.1 (standard deviation = 1.2), while the mode was “agree” (41% of responses). The seemingly neutral mean (3.1 on a 5-point response scale) masks the near majority (47%) of respondents who strongly agreed or agreed that their city’s transportation infrastructure was adequate.

A 3.8 mean (standard deviation = 1.0) and “agree” mode (56% of responses) both accurately represent that most city managers felt their city’s police and fire protection services were adequate. In fact, over three-fourths (78%) of city managers reported they strongly agreed or agreed that their city’s police and fire protection services were adequate.

The correlations between variables produced limited support for WH1. Overall, a weak but significant negative relationship ($r = -.12, p < .05$) was detected between the current level of development sprawl and transportation infrastructure adequacy (WH1b). This relationship remained significant for general law cities ($r = -.2, p < .05$) but not for home rule cities. The

³⁵ See Appendix B for response frequencies for each survey item.

expected relationships between the current level of development sprawl and tax base adequacy (WH1a) as well as the current level of development sprawl and police and fire protection services adequacy (WH1c) were not shown. In fact, in home rule cities, there was a weak but significant positive relationship ($r = .17, p < .05$) between the current level of development sprawl and tax base adequacy.

WH2: Frequency of Annexations

The second purpose of this research study is to explore Texas city managers' assessments of the relationship between development sprawl and city annexation. Scholarly literature led to the expectation that development sprawl increases the frequency of city annexations due to a need to capture a scattered tax base (WH2). To test this expectation, two sub-working hypotheses were developed. The first (WH2a) expected a positive relationship between the level of development sprawl over time and completed annexations. A second (WH2b) positive relationship was also expected between the current level of development sprawl and future annexations.

Table 5.2 displays the modes, means, standard deviations, and correlations for the variables tested in WH2. Most city managers reported development sprawl outside city boundaries has increased over the past five years (mean = 3.8, standard deviation = .8; mode = increased (66% of responses)), and, as previously described, the current level of this growth was most frequently moderate.

Table 5.2: Statistics for WH2: Frequency of City Annexations

Variable	Overall Mean & Mode	Overall Standard Deviation	Level of Development Sprawl Over Time			Current Level of Development Sprawl		
			Overall Correlation Coefficient N=303 ^a	General Law Correlation Coefficient N=140 ^b	Home Rule Correlation Coefficient N=163 ^c	Overall Correlation Coefficient N=303 ^a	General Law Correlation Coefficient N=140 ^b	Home Rule Correlation Coefficient N=163 ^c
Level of Development Sprawl Over Time	3.8 Increased	.8	1	1	1			
Completed Annexations	3.17 1 to 5 ^d	7.7	.20*	.28*	.15			
Current Level of Development Sprawl	3.0 Moderate	1.1				1	1	1
Future Annexations	3.14 1 to 5 ^d	6.9				.21*	.23*	.21*

* significant at .01 level

a The actual number varied by variable between 303 and 305.

b The actual number varied by variable between 140 and 141.

c The actual number varied by variable between 163 and 164.

d Interval response scale was recoded to 3 response categories to calculate the mode (0, 1 to 5, 6 or more).

Reponses for the number of completed and future annexations varied greatly.³⁶ In order to better describe the central tendency through the mode, responses are combined into three categories (“0 annexations,” “1 to 5 annexations,” and “6 or more annexations”). The mean for completed annexations in the past five years was 3.17 (standard deviation = 7.7), while the mode was “1 to 5 annexations” (49% of responses); the mean for future annexations in the next five years was 3.14 (standard deviation = 6.9), while the mode was “1 to 5 annexations” (61% of responses).

The correlations presented mixed support for WH2. Overall, there was a weak but significant positive relationship ($r = .20, p < .01$) between the level of development sprawl over time and completed annexations (WH2a) as well as a weak but significant positive relationship ($r = .21, p < .01$) between the current level of development sprawl and future annexations (WH2b). Similar weak but significant positive relationships were found for general law cities alone ($r = .28, p < .01$ & $r = .23, p < .01$). The correlations for home rule cities alone, however, were

³⁶ The questions assessing these variables were open-ended.

mixed. A weak, but significant positive relationship ($r = .21, p < .01$) existed for the current level of development sprawl and future annexations (WH2b), but the positive correlation between the level of development sprawl over time and completed annexations (WH2a) was not significant.³⁷

WH3: City Managers' Impressions of Regional Governance

The third purpose of this research study is to explore Texas city managers' assessments of the relationship between development sprawl and their impressions of regional governance. An overarching hypothesis (WH3), which was developed from existing scholarly research, postulated that city officials exhibit varying degrees of support for regional governance based on the balance between the necessity of regional governance and the importance of local control. To test this expectation, four sub-working hypotheses were developed. The first (WH3a) expected a positive relationship between the current level of development sprawl and general esteem for regional governance. In the second (WH3b), a positive relationship between the current level of development sprawl and support for regional transportation infrastructure planning was anticipated. No relationship was expected between the current level of development sprawl and support for regional police and fire protection services planning for the third sub-working hypothesis (WH3c). Lastly, the fourth (WH3d) did not anticipate a relationship between the current level of development sprawl and support for regional land-use planning.

³⁷ Other interesting correlations found include a very strong, significant positive correlation between completed annexations and future annexations in home rule cities, but only a moderate correlation between the two variables in general law cities. Home rule appear to more consistently annex from year-to-year than general law cities. This is likely attributed to the fact that general law cities have less unilateral authority to annex than home rule cities. General law cities' annexation "schedules" are less in their control than home rule cities' "schedules." See Appendix B for these complete correlation matrices.

Table 5.3 contains the modes, means, standard deviations, and correlations for the variables tested in WH3. As noted for the two previous hypotheses, city managers most frequently reported a moderate level of development in the unincorporated areas surrounding city boundaries.

Table 5.3: Statistics for WH2: City Manger’s Impression of Regional Governance

Variable	Overall Mean & Mode	Overall Standard Deviation	Current Level of Development Sprawl		
			Overall Correlation Coefficient N=303 ^a	General Law Correlation Coefficient N=140 ^b	Home Rule Correlation Coefficient N=163 ^c
Current Level of Development Sprawl	3.0 Moderate	1.1	1	1	1
General Impression of Voluntary Regional Governance	3.4 Agree	.9	.04	.03	.09
Support for Voluntary Regional Transportation Infrastructure Planning	3.9 Agree	.9	.24*	.26*	.21*
Support for Voluntary Regional Police and Fire Protection Services Planning	3.1 Agree	1.1	-.01	.08	-.03
Support for Voluntary Regional Land-Use Planning	3.2 Agree	1.0	.01	.01	.01

* significant at .01 level

a The actual number varied by variable between 303 and 305.

b The actual number varied by variable between 140 and 141.

c The actual number varied by variable between 163 and 164.

The mean response for city managers’ general impression of regional governance was 3.4 (standard deviation = .9), and the mode was “agree” (47% of responses). The mean of 3.14 describes that on average city managers have a neutral impression of regional governance, while the mode of agree indicates that almost half of city managers agreed they have a favorable impression of regional governance. By examining the entire distribution of responses, it becomes clear that the mode more accurately describes the central tendency, because a majority (53%) of city managers strongly agreed or agreed that they have a favorable impression of regional governance.

An even stronger majority, almost three-fourths of respondents (74%), strongly agreed or agreed with the statement that regional governance should play a role in regional transportation planning. The mean (3.9 with a standard deviation of .9) and the mode (“agree” with 51% of responses) both accurately represent the central tendency.

The distribution for support for voluntary regional police and fire protection services planning was somewhat evenly distributed. The mean response was 3.1 (standard deviation = 1.1), and the mode was “agree” (34% of responses). Although city managers most frequently reported agreeing with the statement that regional governance should play a role in police and fire protection services planning, the response percentage for those that strongly agreed or agreed with the statement was under a majority (42%). One-quarter (25%) of respondents had a neutral opinion and one-third (33%) strongly disagreed or disagreed with the statement.

The final variable, support for voluntary land-use planning, has a mean response of 3.2 (standard deviation = 1.0) and a mode of “agree” (40% of responses). Not quite half (47%) of city managers strongly agreed or agreed with the statement that regional governance should play a role in land-use planning. Nearly one-fourth (24%) were neutral, and over one-fourth (29%) strongly agreed or disagreed.

The correlations provided mixed support for WH3. Correlations for three of the four sub-working hypotheses were as expected. There was a weak but significant positive relationship ($r = .24, p < .01$) between support for voluntary regional transportation infrastructure planning and the current level of development sprawl (WH3b). There were also as expected no significant relationship between the current level of development sprawl and support for voluntary regional police and fire protection services planning (WH3c) and the current level of development sprawl and support for voluntary regional land-use planning (WH3d).

The unexpected correlation was the **insignificant**, positive correlation between general impressions of voluntary regional governance and the current level of development sprawl (WH3a). General favorable impressions of voluntary regional governance persist without any influence from the level of development sprawl. ³⁸

Chapter Summary

The statistical analysis of the survey data partially supports each working hypothesis. When significant relationships were found, they were weak. The strength of these significant relationships may be undervalued by the limited response ranges (five valid choices) for nine of the eleven survey items.³⁹ Nonetheless, many of the relationships proved significant. The next chapter summarizes these research findings and discusses their potential influence on future development sprawl research and state policy.

³⁸ There were no apparent differences between general law and home rule cities for each of the correlations for WH3.

³⁹ Two of the survey items were open-ended. One assessed the number of annexations completed in the past five years, and the other assessed the number of expected annexations in the next five years.

Chapter VI: Conclusion

Chapter Purpose

This final chapter makes recommendations for future state action and scholarly research. These recommendations are made by reflecting upon the sum of the research study's contents: the summary of previous scholarly research on development sprawl, the discussion of Texas's demographic and legal setting, and the results of the survey instrument. This chapter is important, because it secures this research study within the body of existing scholarly research and policy debate.

Summary of Research

The purpose of this research study was to explore Texas city managers' assessments of (1) the effects of development sprawl on city finance and service provision, (2) the relationship between development sprawl and city annexation, and (3) the relationship between development sprawl and their impressions of regional governance. The study was exploratory because of the limited scholarly research regarding the relationship between these topics in general and the absence of any comprehensive research on development sprawl in Texas.

The review of available scholarly literature led to three broad expectations regarding city managers' attitudes and perceptions. First, development sprawl negatively affects city finance and service provision. Second, development sprawl increases the frequency of city annexations. Third, development sprawl positively influences only certain aspects of support for regional governance due to strong preferences for local control. These expectations became the study's overarching working hypotheses.

To guide data collection and analysis, each overarching working hypothesis was broken into sub-working hypotheses. Those sub-working hypotheses served as the skeleton for the

survey instrument. By deliberate design, each survey item measured one independent or dependent variable within each sub-working hypothesis.

City managers were chosen as the unit of analysis due to their role as a city's chief operating officer. In total, 62% of the 540 surveys sent to the most complete existing list of Texas city managers were returned.

Correlations were run to test support for each sub-working hypotheses. The analysis of survey data collected only partially met expectations. Table 6.1 presents the summary of support ratings for each working hypothesis.

WH1: City Finance and Service Provision

Of the three sub-working hypotheses, only one, the relationship between the current level of development sprawl and transportation infrastructure adequacy (WH1b), produced the expected significant negative correlation. This correlation was apparent for all cities combined and general law cities alone but not for home rule cities. For these reasons, WH1 received a support rating of weak partial support.

WH2: Frequency of Annexations

Correlations for WH2 produced almost conclusive evidence of support. The expected positive relationship between the current level of development sprawl and future annexations (WH2b) was significant in all three matrices (all cities combined, general law cities, and home rule cities). The expected positive relationship between the level of development sprawl over time and completed annexations (WH2a) was only significant in two matrices (all cities combined and general law cities). For these reasons, WH2 received a support rating of strong partial support.

Table 6.3: Summary of Findings

Working Hypothesis		Sub-Working Hypothesis Support	Working Hypothesis Support	
WH1	Development sprawl negatively affects city finance and service provision.		Weak Partial Support	
	WH1a	Development sprawl negatively affects a city's tax base.		Reject
	WH1b	Development sprawl negatively affects city transportation infrastructure.		Mixed
	WH1c	Development sprawl negatively affects city police and fire protection services.		Reject
WH2	Development sprawl positively affects the frequency of city annexations.		Strong Partial Support	
WH2a	Development sprawl positively affects the frequency of city annexations over time.	Mixed		
WH2b	Development sprawl positively affects the likelihood of future city annexations.	Support		
WH3	Development sprawl results in varying support for regional governance.		Strong Partial Support	
WH3a	Development sprawl positively affects general esteem for regional governance.	Reject		
WH3b	Development sprawl positively affects support for regional transportation infrastructure planning.	Support		
WH3c	Development sprawl does not affect support for regional police and fire protection services planning.	Support		
WH3d	Development sprawl does not affect support for regional land-use planning.	Support		

WH3: City Managers' Impressions of Regional Governance

Three of the sub-working hypotheses were supported in the correlations for WH3. As expected, the current level of development sprawl was positively and significantly related to support for transportation infrastructure planning (WH3b) and not related to support for land-use planning (WH3d) or police and fire protection services planning (WH3c). The expected positive relationship between the current level of development sprawl and general esteem for regional

governance (WH3a) was not found. For these reasons, WH3 received a support rating of strong partial support.

Future State Policy

Although the results of the data analysis are mixed, they do communicate three recommendations for state policy. First, the state should enter the development sprawl debate. As of today, the state has not assessed the effect development sprawl has on city finance and service provision or the adequacy of city development control authority. Survey results show that most cities with city managers, despite home rule or general law status, have experienced increased development growth in the unincorporated areas outlying city boundaries, and in most instances, the amount of existing development is moderate or high. Because of this statewide pattern of development and the rapidly growing Texas population, the state would be well served by an in-depth analysis of growth in the state and the adequacy of local development authority.

Second, the state should more aggressively encourage, with the often more effective and popular “carrot” (i.e. transportation dollars) than “stick” (i.e. mandates), regional transportation planning efforts. Survey results show that most city managers appear receptive to voluntary regional transportation planning and that sprawling development negatively affects city transportation infrastructure. It is possible that local transportation efforts are inadequate to successfully address transportation challenges, and cities are now ready to relinquish one area of local control to regionalism. State leadership and support may be critical for all cities to make this “leap of faith.”

Third, the state should preserve city annexation authority. The survey results reveal that cities experiencing sprawling development outside city boundaries are annexing more often than

those who are not. Without this ability to grow, the potential financial health of cities may be jeopardized, regardless of the economy's condition.

Next Steps for Research

The current study strove to collect a large body of information regarding multiple aspects of development sprawl. To do this, the brevity of the survey instrument was critical in assuring an adequate response rate. Future studies should be more focused than the current study in an effort to capture the nuances in relationships measured.

In general, when expected significant relationships were found in this study, they were weak. Future studies should strive to measure each variable more precisely than the current study, in an effort to discover stronger relationships.

More specifically, an important yet obvious research finding was that city managers in general law cities, as a whole, responded more homogenously to survey items than home rule city managers. This may be reflective of the fact that general law cities are closer in population (usually under 5,000) and can only do those things made explicit by state law, while home rule cities range widely in population (from almost two million to 5,000 in population) and can do those things not expressly prohibited. Future studies should explore differences among home rule cities as they relate to development sprawl.

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TEX. CONST. Art. XI, § 5.

TEX. LOC. GOV'T CODE ANN., Ch. 21 (Vernon 1999).

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TEX. LOC. GOV'T CODE ANN., Ch. 23 (Vernon 1999).

TEX. LOC. GOV'T CODE ANN., Ch. 25 (Vernon 1999).

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APPENDIX A

Please complete the following questionnaire items.

Name of City: _____

Please circle the best response to the following items.

- 1. Over the past five years, development in the unincorporated areas surrounding the city limits has
Greatly Increased Increased Remained the Same Decreased Greatly Decreased N/A

- 2. Currently, the amount of development in the unincorporated areas surrounding the city limits is
Very High High Moderate Low Very Low N/A

Please fill in your answer to the following items.

- 3. In the blank space provided below, indicate the number of annexations the city has completed in the past five years.

- 4. In the blank space provided below, indicate the number of annexations the city will likely perform in the next five years.

Please indicate the extent to which you agree or disagree with the following statements by using the scale below:

SA -- Strongly Agree
A -- Agree
N -- Neutral
D -- Disagree
SD -- Strongly Disagree

- 5. The city's transportation infrastructure is adequate. SA A N D SD

- 6. The city's police and fire protection services are adequate. SA A N D SD

- 7. The city's tax base is adequate. SA A N D SD

8. Generally speaking, my impression of voluntary regional approaches to governance is favorable. SA A N D SD
9. Voluntary regional governmental entities should play a role in transportation infrastructure planning. SA A N D SD
10. Voluntary regional governmental entities should play a role in police and fire protection services planning. SA A N D SD
11. Voluntary regional governmental entities should play a role in land-use planning. SA A N D SD

Additional Comments:

Thank you for your help.

Please return the completed questionnaire to Rachael Jeffers in the enclosed, addressed and stamped envelope by October 15.

If you have any questions, please contact Rachael Jeffers at rj1005@txstate.edu or 512-426-1342.

APPENDIX B

Survey Completion by COG Region

COG Region	Frequency	Percent
1	21	6.3
2	16	4.8
3	9	2.7
4	77	23.1
5	6	1.8
6	10	3.0
7	13	3.9
8	4	1.2
9	8	2.4
10	4	1.2
11	12	3.6
12	21	6.3
13	4	1.2
14	10	3.0
15	5	1.5
16	41	12.3
17	4	1.2
18	27	8.1
19	1	.3
20	7	2.1
21	18	5.4
22	7	2.1
23	8	2.4
24	1	.3
Total	334	100.0

Frequency Tables

Current level of development sprawl

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Low	34	10.2	11.1	11.1
	Low	63	18.9	20.7	31.8
	Moderate	116	34.7	38.0	69.8
	High	57	17.1	18.7	88.5
	Very High	35	10.5	11.5	100.0
	Total	305	91.3	100.0	
Missing	N/A	29	8.7		
Total		334	100.0		

Tax base adequacy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	31	9.3	9.3	9.3
	Disagree	129	38.6	38.7	48.0
	Neutral	39	11.7	11.7	59.8
	Agree	110	32.9	33.0	92.8
	Strongly Agree	24	7.2	7.2	100.0
	Total	333	99.7	100.0	
Missing	Not Answered	1	.3		
Total		334	100.0		

Transportation infrastructure adequacy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	34	10.2	10.2	10.2
	Disagree	87	26.0	26.1	36.3
	Neutral	56	16.8	16.8	53.2
	Agree	135	40.4	40.5	93.7
	Strongly Agree	21	6.3	6.3	100.0
	Total	333	99.7	100.0	
Missing	Not Answered	1	.3		
Total		334	100.0		

Police and fire protection services adequacy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	2.7	2.7	2.7
	Disagree	36	10.8	10.8	13.6
	Neutral	29	8.7	8.7	22.3
	Agree	186	55.7	56.0	78.3
	Strongly Agree	72	21.6	21.7	100.0
	Total	332	99.4	100.0	
Missing	Not Answered	1	.3		
	System	1	.3		
	Total	2	.6		
Total		334	100.0		

Level of development sprawl over time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Greatly Decreased	2	.6	.7	.7
	Decreased	6	1.8	2.0	2.6
	Remained the Same	96	28.7	31.5	34.1
	Increased	148	44.3	48.5	82.6
	Greatly Increased	53	15.9	17.4	100.0
	Total	305	91.3	100.0	
Missing	N/A	29	8.7		
Total		334	100.0		

Completed annexations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	130	38.9	38.9	38.9
	1	54	16.2	16.2	55.1
	2	48	14.4	14.4	69.5
	3	25	7.5	7.5	76.9
	4	10	3.0	3.0	79.9
	5	25	7.5	7.5	87.4
	6	6	1.8	1.8	89.2
	7	5	1.5	1.5	90.7
	8	6	1.8	1.8	92.5
	9	1	.3	.3	92.8
	10	3	.9	.9	93.7
	11	1	.3	.3	94.0
	12	5	1.5	1.5	95.5
	14	1	.3	.3	95.8
	15	3	.9	.9	96.7
	20	1	.3	.3	97.0
	25	4	1.2	1.2	98.2
	26	2	.6	.6	98.8
	30	1	.3	.3	99.1
	33	1	.3	.3	99.4
	38	1	.3	.3	99.7
	107	1	.3	.3	100.0
	Total	334	100.0	100.0	

Future annexations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	98	29.3	29.4	29.4
	1	64	19.2	19.2	48.6
	2	46	13.8	13.8	62.5
	3	48	14.4	14.4	76.9
	4	10	3.0	3.0	79.9
	5	34	10.2	10.2	90.1
	6	4	1.2	1.2	91.3
	7	2	.6	.6	91.9
	10	13	3.9	3.9	95.8
	12	3	.9	.9	96.7
	15	1	.3	.3	97.0
	18	1	.3	.3	97.3
	20	3	.9	.9	98.2
	25	2	.6	.6	98.8
	26	2	.6	.6	99.4
	35	1	.3	.3	99.7
	100	1	.3	.3	100.0
	Total	333	99.7	100.0	
Missing	System	1	.3		
	Total	334	100.0		

General impression of voluntary regional governance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	2.7	2.7	2.7
	Disagree	49	14.7	14.8	17.5
	Neutral	98	29.3	29.6	47.1
	Agree	156	46.7	47.1	94.3
	Strongly Agree	19	5.7	5.7	100.0
	Total	331	99.1	100.0	
Missing	Not Answered	3	.9		
	Total	334	100.0		

Support for voluntary regional transportation infrastructure planning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	.9	.9	.9
	Disagree	21	6.3	6.3	7.2
	Neutral	63	18.9	18.9	26.1
	Agree	168	50.3	50.5	76.6
	Strongly Agree	78	23.4	23.4	100.0
	Total	333	99.7	100.0	
Missing	Not Answered	1	.3		
Total		334	100.0		

Support for voluntary regional police and fire protection services planning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	21	6.3	6.3	6.3
	Disagree	88	26.3	26.5	32.8
	Neutral	84	25.1	25.3	58.1
	Agree	114	34.1	34.3	92.5
	Strongly Agree	25	7.5	7.5	100.0
	Total	332	99.4	100.0	
Missing	Not Answered	2	.6		
Total		334	100.0		

Support for voluntary regional land-use planning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	17	5.1	5.1	5.1
	Disagree	78	23.4	23.4	28.5
	Neutral	80	24.0	24.0	52.6
	Agree	134	40.1	40.2	92.8
	Strongly Agree	24	7.2	7.2	100.0
	Total	333	99.7	100.0	
Missing	Not Answered	1	.3		
Total		334	100.0		

Descriptive Statistics for WH1: City Finance and Service Provision (All Cities)

		Current level of development sprawl	Tax base adequacy	Transport. infrastruct. adequacy	Police and fire protection services adequacy
N	Valid	305	333	333	332
	Missing	29	1	1	2
Mean		2.99	2.90	3.07	3.83
Median		3.00	3.00	3.00	4.00
Mode		3	2	4	4
Std. Deviation		1.141	1.172	1.152	.978

Descriptive Statistics for WH1: City Finance and Service Provision (General Law Cities)

		Current level of development sprawl	Tax base adequacy	Transport. infrastruct. adequacy	Police and fire protection services adequacy
N	Valid	141	147	147	147
	Missing	6	0	0	0
Mean		2.77	2.76	3.02	3.60
Median		3.00	2.00	3.00	4.00
Mode		3	2	3	4
Std. Deviation		1.179	1.178	1.082	1.077

Descriptive Statistics for WH1: City Finance and Service Provision (Home Rule Cities)

		Current level of development sprawl	Tax base adequacy	Transport. infrastruct. adequacy	Police and fire protection services adequacy
N	Valid	164	186	186	185
	Missing	23	1	1	2
Mean		3.17	3.01	3.10	4.02
Median		3.00	3.00	4.00	4.00
Mode		3	4	4	4
Std. Deviation		1.077	1.158	1.206	.850

Correlation Matrix for WH1: City Finance and Service Provision (All Cities)

		Current level of development sprawl	Tax base adequacy	Transportation infrastructure adequacy	Police and fire protection services adequacy
Current level of development sprawl	Pearson Correlation	1	.129*	-.117*	.029
	Sig. (2-tailed)	.	.025	.042	.609
	N	305	304	304	303
Tax base adequacy	Pearson Correlation	.129*	1	.270**	.325**
	Sig. (2-tailed)	.025	.	.000	.000
	N	304	333	333	332
Transportation infrastructure adequacy	Pearson Correlation	-.117*	.270**	1	.380**
	Sig. (2-tailed)	.042	.000	.	.000
	N	304	333	333	332
Police and fire protection services adequacy	Pearson Correlation	.029	.325**	.380**	1
	Sig. (2-tailed)	.609	.000	.000	.
	N	303	332	332	332

*. Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Correlation Matrix for WH1: City Finance and Service Provision (General Law Cities)

		Current level of development sprawl	Tax base adequacy	Transportation infrastructure adequacy	Police and fire protection services adequacy
Current level of development sprawl	Pearson Correlation	1	.068	-.200*	.059
	Sig. (2-tailed)	.	.420	.018	.487
	N	141	141	141	141
Tax base adequacy	Pearson Correlation	.068	1	.106	.302**
	Sig. (2-tailed)	.420	.	.202	.000
	N	141	147	147	147
Transportation infrastructure adequacy	Pearson Correlation	-.200*	.106	1	.295**
	Sig. (2-tailed)	.018	.202	.	.000
	N	141	147	147	147
Police and fire protection services adequacy	Pearson Correlation	.059	.302**	.295**	1
	Sig. (2-tailed)	.487	.000	.000	.
	N	141	147	147	147

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation Matrix for WH1: City Finance and Service Provision (Home Rule Cities)

		Current level of development sprawl	Tax base adequacy	Transportation infrastructure adequacy	Police and fire protection services adequacy
Current level of development sprawl	Pearson Correlation	1	.165*	-.057	-.079
	Sig. (2-tailed)	.	.036	.468	.319
	N	164	163	163	162
Tax base adequacy	Pearson Correlation	.165*	1	.386**	.322**
	Sig. (2-tailed)	.036	.	.000	.000
	N	163	186	186	185
Transportation infrastructure adequacy	Pearson Correlation	-.057	.386**	1	.467**
	Sig. (2-tailed)	.468	.000	.	.000
	N	163	186	186	185
Police and fire protection services adequacy	Pearson Correlation	-.079	.322**	.467**	1
	Sig. (2-tailed)	.319	.000	.000	.
	N	162	185	185	185

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Descriptive Statistics for WH2: Frequency of Annexations (All Cities)

		Level of development sprawl over time	Current level of development sprawl	Completed annexations	Future annexations
N	Valid	305	305	334	333
	Missing	29	29	0	1
Mean		3.80	2.99	3.17	3.14
Median		4.00	3.00	1.00	2.00
Mode		4	3	0	0
Std. Deviation		.767	1.141	7.745	6.935

Descriptive Statistics for WH2: Frequency of Annexations (General Law Cities)

		Level of development sprawl over time	Current level of development sprawl	Completed annexations	Future annexations
N	Valid	141	141	147	146
	Missing	6	6	0	1
Mean		3.70	2.77	2.59	2.88
Median		4.00	3.00	1.00	2.00
Mode		4	3	0	0
Std. Deviation		.801	1.179	5.401	4.284

Descriptive Statistics for WH2: Frequency of Annexations (Home Rule Cities)

		Level of development sprawl over time	Current level of development sprawl	Completed annexations	Future annexations
N	Valid	164	164	187	187
	Missing	23	23	0	0
Mean		3.89	3.17	3.62	3.33
Median		4.00	3.00	1.00	2.00
Mode		4	3	0	0
Std. Deviation		.726	1.077	9.167	8.453

Correlation Matrix for WH2: Frequency of Annexations (All Cities)

		Level of development sprawl over time	Current level of development sprawl	Completed annexations	Future annexations
Level of development sprawl over time	Pearson Correlation	1	.688**	.195**	.140*
	Sig. (2-tailed)	.	.000	.001	.014
	N	305	303	305	304
Current level of development sprawl	Pearson Correlation	.688**	1	.270**	.207**
	Sig. (2-tailed)	.000	.	.000	.000
	N	303	305	305	304
Completed annexations	Pearson Correlation	.195**	.270**	1	.859**
	Sig. (2-tailed)	.001	.000	.	.000
	N	305	305	334	333
Future annexations	Pearson Correlation	.140*	.207**	.859**	1
	Sig. (2-tailed)	.014	.000	.000	.
	N	304	304	333	333

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Correlation Matrix for WH2: Frequency of Annexations (General Law Cities)

		Level of development sprawl over time	Current level of development sprawl	Completed annexations	Future annexations
Level of development sprawl over time	Pearson Correlation	1	.738**	.283**	.245**
	Sig. (2-tailed)	.	.000	.001	.004
	N	141	140	141	140
Current level of development sprawl	Pearson Correlation	.738**	1	.284**	.228**
	Sig. (2-tailed)	.000	.	.001	.007
	N	140	141	141	140
Completed annexations	Pearson Correlation	.283**	.284**	1	.555**
	Sig. (2-tailed)	.001	.001	.	.000
	N	141	141	147	146
Future annexations	Pearson Correlation	.245**	.228**	.555**	1
	Sig. (2-tailed)	.004	.007	.000	.
	N	140	140	146	146

** Correlation is significant at the 0.01 level (2-tailed).

Correlation Matrix for WH2: Frequency of Annexations (Home Rule Cities)

		Level of development sprawl over time	Current level of development sprawl	Completed annexations	Future annexations
Level of development sprawl over time	Pearson Correlation	1	.623**	.149	.099
	Sig. (2-tailed)	.	.000	.057	.206
	N	164	163	164	164
Current level of development sprawl	Pearson Correlation	.623**	1	.267**	.210**
	Sig. (2-tailed)	.000	.	.001	.007
	N	163	164	164	164
Completed annexations	Pearson Correlation	.149	.267**	1	.932**
	Sig. (2-tailed)	.057	.001	.	.000
	N	164	164	187	187
Future annexations	Pearson Correlation	.099	.210**	.932**	1
	Sig. (2-tailed)	.206	.007	.000	.
	N	164	164	187	187

** Correlation is significant at the 0.01 level (2-tailed).

Descriptive Statistics for WH3: City Managers' Impression of Regional Governance (All Cities)

		Current level of development sprawl	General impression of voluntary regional governance	Support for voluntary regional transportation infrastructure planning	Support for voluntary regional police and fire protection services planning	Support for voluntary regional land-use planning
N	Valid	305	331	333	332	333
	Missing	29	3	1	2	1
Mean		2.99	3.38	3.89	3.10	3.21
Median		3.00	4.00	4.00	3.00	3.00
Mode		3	4	4	4	4
Std. Deviation		1.141	.902	.864	1.075	1.043

Descriptive Statistics for WH3: City Managers' Impression of Regional Governance (General Cities)

		Current level of development sprawl	General impression of voluntary regional governance	Support for voluntary regional transportation infrastructure planning	Support for voluntary regional police and fire protection services planning	Support for voluntary regional land-use planning
N	Valid	141	145	147	146	147
	Missing	6	2	0	1	0
Mean		2.77	3.32	3.76	3.29	3.28
Median		3.00	3.00	4.00	3.00	4.00
Mode		3	4	4	4	4
Std. Deviation		1.179	.897	.805	1.010	1.026

Descriptive Statistics for WH3: City Managers' Impression of Regional Governance (Home Rule Cities)

		Current level of development sprawl	General impression of voluntary regional governance	Support for voluntary regional transportation infrastructure planning	Support for voluntary regional police and fire protection services planning	Support for voluntary regional land-use planning
N	Valid	164	186	186	186	186
	Missing	23	1	1	1	1
Mean		3.17	3.43	3.99	2.96	3.16
Median		3.00	4.00	4.00	3.00	3.00
Mode		3	4	4	2 ^a	4
Std. Deviation		1.077	.905	.897	1.104	1.056

^a. Multiple modes exist. The smallest value is shown

Correlation Matrix for WH3: City Managers' Impression of Regional Governance (All Cities)

		Current level of development sprawl	General impression of voluntary regional governance	Support for voluntary regional transportation infrastructure planning	Support for voluntary regional police and fire protection services planning	Support for voluntary regional land-use planning
Current level of development sprawl	Pearson Correlation	1	.041	.242**	-.009	-.006
	Sig. (2-tailed)	.	.483	.000	.872	.922
	N	305	302	304	303	304
General impression of voluntary regional governance	Pearson Correlation	.041	1	.271**	.226**	.139*
	Sig. (2-tailed)	.483	.	.000	.000	.011
	N	302	331	331	331	331
Support for voluntary regional transportation infrastructure planning	Pearson Correlation	.242**	.271**	1	.376**	.426**
	Sig. (2-tailed)	.000	.000	.	.000	.000
	N	304	331	333	332	333
Support for voluntary regional police and fire protection services planning	Pearson Correlation	-.009	.226**	.376**	1	.571**
	Sig. (2-tailed)	.872	.000	.000	.	.000
	N	303	331	332	332	332
Support for voluntary regional land-use planning	Pearson Correlation	-.006	.139*	.426**	.571**	1
	Sig. (2-tailed)	.922	.011	.000	.000	.
	N	304	331	333	332	333

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Correlation Matrix for WH3: City Managers' Impression of Regional Governance (General Law Cities)

		Current level of development sprawl	General impression of voluntary regional governance	Support for voluntary regional transportation infrastructure planning	Support for voluntary regional police and fire protection services planning	Support for voluntary regional land-use planning
Current level of development sprawl	Pearson Correlation	1	-.031	.259**	.078	.010
	Sig. (2-tailed)	.	.714	.002	.360	.906
	N	141	139	141	140	141
General impression of voluntary regional governance	Pearson Correlation	-.031	1	.328**	.143	.020
	Sig. (2-tailed)	.714	.	.000	.086	.807
	N	139	145	145	145	145
Support for voluntary regional transportation infrastructure planning	Pearson Correlation	.259**	.328**	1	.389**	.454**
	Sig. (2-tailed)	.002	.000	.	.000	.000
	N	141	145	147	146	147
Support for voluntary regional police and fire protection services planning	Pearson Correlation	.078	.143	.389**	1	.560**
	Sig. (2-tailed)	.360	.086	.000	.	.000
	N	140	145	146	146	146
Support for voluntary regional land-use planning	Pearson Correlation	.010	.020	.454**	.560**	1
	Sig. (2-tailed)	.906	.807	.000	.000	.
	N	141	145	147	146	147

** Correlation is significant at the 0.01 level (2-tailed).

Correlation Matrix for WH3: City Managers' Impression of Regional Governance (Home Rule Cities)

		Current level of development sprawl	General impression of voluntary regional governance	Support for voluntary regional transportation infrastructure planning	Support for voluntary regional police and fire protection services planning	Support for voluntary regional land-use planning
Current level of development sprawl	Pearson Correlation	1	.089	.205**	-.029	.005
	Sig. (2-tailed)	.	.260	.009	.717	.953
	N	164	163	163	163	163
General impression of voluntary regional governance	Pearson Correlation	.089	1	.222**	.305**	.235**
	Sig. (2-tailed)	.260	.	.002	.000	.001
	N	163	186	186	186	186
Support for voluntary regional transportation infrastructure planning	Pearson Correlation	.205**	.222**	1	.414**	.428**
	Sig. (2-tailed)	.009	.002	.	.000	.000
	N	163	186	186	186	186
Support for voluntary regional police and fire protection services planning	Pearson Correlation	-.029	.305**	.414**	1	.576**
	Sig. (2-tailed)	.717	.000	.000	.	.000
	N	163	186	186	186	186
Support for voluntary regional land-use planning	Pearson Correlation	.005	.235**	.428**	.576**	1
	Sig. (2-tailed)	.953	.001	.000	.000	.
	N	163	186	186	186	186

** Correlation is significant at the 0.01 level (2-tailed).