PROSPECTUS
EXPLORING DEVELOPMENT SPRAWL IN TEXAS

STATEMENT OF RESEARCH PROBLEM

Simply defined, development sprawl refers to the expansive spatial growth of low-density development often occurring outside city boundaries (Carruthers & Ulfarsson, 2002, p. 314). The causes of development sprawl are tied to the basic economic concept of negative externality.[1] The alleged effects of sprawl are positive[2] and negative[3].

The federal government and many state governments implement policies to control the believed negative effects of development sprawl. Local governments, however, bear the primary responsibility for managing development sprawl either through state or federal directives and incentives or through local rule.[4] Of all development policies used by cities, annexation and regional government are considered mega-policies, because both extend the implementation area of other development policies.[5]

This research project focuses on Texas. The Texas Legislature does permit cities to implement most development management policies, including the mega-policies. Annexation

[1] A negative externality occurs when the consumption of private goods leads to uncompensated costs to society. In this case, the true social cost of sprawling development is not accurately represented in the private cost necessary to buy and live in sprawling developments. The result is that development sprawl persists at a much greater rate than society can absorb without harm. See, Baldassare, 1992; Carr and Feiock, 2001, p. 459; Carruthers & Ulfarsson, 2002; Dowling, 2000; Geddes, 1997; Heim, 2001; Lopez and Hynes, 2003; Orlebeke (2002); Rybczynski and Linneman, 1999; Wessels, 2000, p.493-494.

[2] Argued positive effects include: realization of consumer preferences for suburban life, realization of the best value for land, increased availability of new single-family detached homes, and the presence of new amenities surrounding homes. See, Heim, 2000; Lopez & Hynes, 2003; Ohls & Pines, 1975; Persky & Lester, 2002; Phillips & Goodstein, 2000

[3] Argued negative effects include: elimination of open-space and farmland, increased air pollution due to automobile dependency, weakened social ties, decreased worker productivity, premature over utilization of city infrastructure, decrease in quality of police and fire protection services, and dwindling city tax bases. 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

[4] 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. See, Daniels, 2001; Leo & Beavis, 1998; Stoel, 1999

[5] See, Daniels, 2001, p. 240; Leo & Beavis, 1998, p. 190

authority, however, has been limited in recent years with the passage of policy favoring private property rights.[6] In addition, regional governments in Texas are underutilized due to limited state-vested authority and voluntary participation.[7]

Aside from vesting cities with development policy authority, the 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. In addition, little scholarly research exists on development sprawl in Texas.

This research project, consequently, is a preliminary attempt to assess how development sprawl in Texas affects city government. Specifically, the purpose of the research project 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 government.

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

CONCEPTUAL FRAMEWORK

The common conceptual framework used to satisfy an exploratory research purpose is working hypotheses. Working hypotheses serve as guides to early-stage investigations (Shields,

[6] See, S.B. 89, 76th Legislature; TEX. LOC. GOV'T CODE ANN., Ch. 43 (Vernon 1999 & Supp. 2003)
[7] TEX. LOC. GOV'T CODE ANN. Ch. 391 (Vernon 1999 & Supp. 2003); TARC, www.tarc.org

1998, p. 57). The working hypotheses are not ends in themselves but means to greater understanding.

This study develops three overarching working hypotheses, each with multiple sub-hypotheses. Table 1A, 1B, and 1C present the working hypotheses and a list of literature sources used to develop each hypotheses. The remainder of this conceptual framework section contains a narrative of the conceptual framework tables.

WORKING HYPOTHESIS 1

The first purpose of this research project is to explore Texas city managers' assessments of the effects of development sprawl on city finance and service provision. Working Hypothesis 1 and its three defining sub-hypotheses are drawn from the literature to satisfy this research purpose. Table 1A shows the connection between the working hypotheses and the literature sources.

TABLE 1A
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	Source
WH1: Development sprawl negatively affects city finance and service provision.	Carruthers & Ulfarsson, 2002; Daniels, 2001; Gurwitt, 2000; Leo & Beavis, 1998; Liner & McGregor, 1996; Stoel, 1999
WH1a: Development sprawl negatively affects city transportation infrastructure.	Gurwitt, 2000; Stoel, 1999
WH1b: Development sprawl negatively affects city police and fire protection services.	Gurwitt, 2000; Stoel, 1999
WH1c: Development sprawl negatively affects city tax bases.	Carruthers & Ulfarsson, 2002; Daniels, 2001; Leo & Beavis, 1998; Liner & McGregor, 1996

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 consumer preferences. The negative effects of sprawl are largely embodied in the long-term livability of communities. This study focuses on how sprawl affects city finance and service provision.

Gurwitt (2000) reveals through interviews with city managers in California, Florida, and Ohio 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. Sprawling development outside city boundaries results in cities having to support a demand for services that is greater than the tax base (Gurwitt, 2000, p. 38).

Stoel (1999) arrives 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).[8]

Thus, this study expects to find the following:

Working Hypothesis 1a (WH1a):
Development sprawl negatively affects city transportation infrastructure.

Working Hypothesis 1b (WH1b):
Development sprawl negatively affects city police and fire protection services.

Liner and McGregor (1996, p. 55) in a study examining annexation policies and rates in 659 U.S. cities argue that the major function of city governments is service provision. They conclude that the ability to provide services is largely dependent on the city's tax base (Liner &

[8] 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).

McGregor, 1996, p. 63). Carr and Feiock (2001, p. 459) in a review of U.S. Census data find that most new development is sprawling development occurring outside city boundaries. Thus, it is expected that development sprawl strains a city's tax base.

Further straining a city's tax base, Daniels (2001, p. 231) finds 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 is, according to Leo and Beavis in a 1998 (p.186) review of literature and state laws, the tax base in central cities declines, and city property tax rates must increase to maintain the quality of city infrastructure and services.

Supporting Daniels (2001), Carruthers and Ulfarsson (2002, 315) in a study examining the relationship between political fragmentation and sprawl identify a negative aspect of sprawl's fulfillment of consumer preferences for low-density, suburban development. Residents within the city must bear the entire cost of the debt necessary to provide the public services enjoyed by the residents inside and outside city limits (Carruthers & Ulfarsson, 2002, p. 315).

Based on these findings, the following relationship is expected:

Working Hypothesis 1c (WH1c):
Development sprawl negatively affects city tax bases.

In sum, a review of the literature shows that development sprawl results in a tax base inadequate to support demand for services. As a result of these research findings, the author developed the following overarching hypothesis for Research Purpose 1.

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

WORKING HYPOTHESIS 2

The second purpose of this research project is to explore Texas city managers' assessments of the relationship between development sprawl and city annexation. Working Hypothesis 2 and its two defining sub-hypotheses are drawn from the literature to satisfy this research purpose. Table 1B shows the connection between the working hypotheses and the literature sources.

TABLE 1B
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	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

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). The literature shows that cities annex to alleviate the negative fiscal and service consequences of sprawling development outside of city boundaries.

Liner and McGregor (1996, p. 57) conclude 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, according to the authors, because cities are attempting to recapture the city's tax base (Liner & McGregor, 1996, p. 63).

In a 2001 study, Carr and Feiock examine the effects of state regulations on the frequency of city annexations in the U.S. The authors find that most development growth today occurs in unincorporated areas although cities retain the primary responsibility to manage growth (Carr & Feiock, 2001, p. 459). This leads Carr and Feiock (2001, p. 459) to conclude that annexation is an effective tool cities use to "capture" sprawling growth so that it can be regulated.

Corroborating this finding, Carruthers and Ulfarsson (2002, p. 329) in an analysis of U.S. Census data find a statistically significant positive relationship between political fragmentation and sprawl in the 14 most populous U.S. states. Carruthers and Ulfarsson (2002, p. 355) conclude that annexation provides cities a tool to reduce political fragmentation; thus, reducing sprawl.

As a result of these research findings, the author believes that the suspected detrimental effects of development sprawl result in cities annexing more frequently than they would otherwise in an effort to minimize or reverse the suspected negative effects of sprawling development in the unincorporated areas surrounding cities. Based on this conclusion, the overarching hypothesis and its two defining sub-hypotheses are as follows:

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.

WORKING HYPOTHESIS 3

The third purpose of this research project is to explore Texas city managers' assessments of the relationship between development sprawl and their impressions of regional government. Working Hypothesis 3 and its four defining sub-hypotheses are drawn from the literature to satisfy this research purpose. Table 1C shows the connection between the working hypotheses and the literature sources.

TABLE 1C
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 government.

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

Since growth management problems occur regionally, many scholars believe the problems must be attacked regionally.[9] As Cigler (1998, p. 53) explains, "solutions must be sought on a regional basis, because problems spill over the boundaries of geographic-based local governments." Regional management of development growth, however, is rarely realized, because political leaders are often unwilling to think regionally at the potential expense of local interests.[10] Consequently, many studies, as does the current study, focus on perceptions and attitudes towards regional government.

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

Baldasarre and Hassol (1996, p. 25) conclude that support for regional government decreases as fears of loss of local autonomy increases. System-maintenance functions such as transportation infrastructure planning erode local autonomy less than life-style services such as police and fire protection or local growth regulations such as land-use planning (Baldasarre 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) observes that city officials seldom support regional government policies that override local

[9] See, Baldassare & Hassol, 1996; Daniels, 2001, p. 240; Johnson, Salkin, & Jordon, 2002, p. 25; Leo & Beavis, 1998, p. 190; Lester & Lombard, 1998

[10] (Baldassare, 1992, p. 484; Leo & Beavis, 1998, pp. 181, 204; Rybczynksi & Linneman, 1999, p. 39) For example, only six states require regional growth planning: California, Florida, Michigan, Oregon, South Carolina, and Washington (Leo & Beavis, 1998, p. 190).

policies. Since participation in regional governments 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, the current study expects the following:

Working Hypothesis 3a (WH3a):
Development sprawl positively affects support for regional transportation infrastructure planning.

Working Hypothesis 3b (WH3b):
Development sprawl does not affect support for regional police and fire protection services.

Working Hypothesis 3c (WH3c):
Development sprawl does not affect support for regional land-use planning.

Carruthers and Ulfarsson (2002, p. 320) conclude after finding a relationship between sprawl and political fragmentation that regional approaches to 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 governments to control growth, although not widespread, is growing in popularity (Carruthers and Ulfarsson (2002, p. 312). They contend that the suspected detrimental effects of development sprawl result in cities supporting regional government 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 (Carruthers & Ulfarsson, 2002, p. 312).

The results of a survey item in Baldassare and Hassol's 1996 study provide some evidence supporting Carruthers and Ulfarsson's conclusions that there is growing support for regional government. Since the overwhelming majority of California cities are in urban metropolitan areas, Baldassare and Hassol (1996, p. 24) state that most survey respondents (city

planners) represent urban and growing cities. The survey results show that a majority (52%) of the 225 city planners who respond to the survey have a favorable opinion of regional government in general (Baldassare & Hassol, 1996, p. 22).

Thus, it is expected that:

Working Hypothesis 3d (WH3d):
Development sprawl positively affects general esteem for regional government.

By considering the four sub-hypotheses, the following overarching hypothesis is as follows:

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

METHODOLOGY

Tables 2A, 2B and 2C show how WH1, WH2, and WH3 are operationalized into survey questions with measurable response categories. WH1 has three sub-hypotheses, each with an independent and dependent variable. WH2 has two sub-hypotheses, each with an independent and dependent variable. WH3 has four sub-hypotheses, each with an independent and dependent variable. Each variable will be 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

The author will conduct survey research as the research technique. Salant and Dillman (1994, p. 9) point out that 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.

Survey research will allow the author to collect the large amount of data necessary to lay the foundation for future studies, thus, satisfying the research purposes. In addition, the conceptual framework supplies the skeleton for the survey questions, and the results of the survey will lend evidence to support or dismiss the working hypotheses.

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, the author proposes three actions. First, to prevent poor survey participation, the author will send 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 will be pretested to address biased questions or incomplete response scales by four individuals with extensive experience with municipal government: one current city manager, a former city manager, and two employees of the Texas Municipal League. Finally, the selection of the city manager as the survey recipient will minimize 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).

TABLE 2A
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: Transportation infrastructure	WH1a		5. The city's transportation infrastructure is adequate.**
Dependent Variable 2: Police and fire protection services	WH1b		6. The city's police and fire protection services are adequate.**
Dependent Variable 3: Tax base	WH1c		7. The city's tax base is 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

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

TABLE 2B
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, development sprawl 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	Very High	5
Increased	4	High	4
Remained the Same	3	Moderate	3
Decreased	2	Low	2
Greatly Decreased	1	Very Low	1
N/A	Record thrown out	N/A	Record thrown out

TABLE 2C
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 government.			
Working Hypothesis 3: Development sprawl results in varying levels of support for regional government.			
Variable	**Hypothesis number**	**Hypothesis Direction**	**Questionnaire Item**
Dependent Variable 1: Regional transportation infrastructure planning	WH3a		9. Regional government should play a role in transportation infrastructure planning.**
Dependent Variable 2: Regional police and fire protection services provision	WH3b		10. Regional government should play a role in the provision of police and fire protection services.**
Dependent Variable 3: Regional land-use planning	WH3c		11. Regional government should play a role inland-use planning.**
Dependent Variable 4: General esteem for regional government	WH3d		8. Generally speaking, my impression of regional government is favorable.**
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	no direction posited	
	WH3c	positive	
	WH3d	no direction posited	

Response Scales and Codes

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

Although it is preferable to have multiple sources of data to corroborate findings (Yin, 1994, p. 92), time and financial limitations do 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 will help lay the foundation for future studies regarding development sprawl in Texas but will not provide a definitive assessment on the topic.

Attachment A contains a copy of the eleven-question survey instrument. When possible, the survey will be e-mailed. If an e-mail address cannot be located, the survey will be sent by regular mail.

UNIT OF ANALYSIS

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

A city manager is the chief appointed official of the 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 issues[11], recommends policy decisions to the city council[12], implements policy adopted by the city council[13], and builds coalitions to champion policy[14].

POPULATION

The population for the study is Texas city managers. The sampling frame is the list of 235 Texas city managers maintained by the Texas Municipal League (TML), a non-profit organization representing Texas cities.[15] The list maintained by TML is the most complete and

[11] DeSantis & Leal, 1998; Wheeland, 1994
[12] DeSantis & Leal, 1998; Wheeland, 1994
[13] Boynton & Wright, 1979; Newell & Ammons, 1987; Svara, 1985; Wheeland, 1994
[14] DeSantis & Leal, 1998; Svara, 1985; Wheeland, 1994; Wikstrom, 1979
[15] 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 and multiple staff persons.

accurate existing list of the study population and is believed to contain virtually all members of the study population.

Surveying the sampling frame is preferable to selecting a sample, because it will more likely provide 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 will be surveyed.

STATISTICS

The author will use descriptive statistics to summarize the survey data. The means and standard deviations of responses for each survey item will be calculated to describe the central tendency and spread of responses. Means and standard deviations will also be calculated to describe differences, if any, among geographic regions of the state and population brackets. The descriptive statistics will provide an easily digestible snap shot of the survey data.

The author will also use Pearson's product-moment correlation r (Correlation r), a type of inferential statistic, to test support for each sub-hypothesis of WH1, WH2, and WH3. Correlation r 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-hypothesis in this study purports the presence or absence of a linear relationship. Tables 2A, 2B, and 2C provide the survey response codes for the surveys that will be used to run the correlation tests.

For WH1, the author will perform a Correlation r test for each of the three sub-hypotheses. For WH1a, the test will assess any relationship between observed differences in the current level of development sprawl and the adequacy of transportation infrastructure. For WH1b, the test will assess any relationship between observed differences in the current level of development sprawl and the adequacy of police and fire protection services. For WH1c, the test

will assess any relationship between observed differences in the current level of development sprawl and the adequacy of the city tax base. If the results of the three correlation tests show a positive or weak negative relationship between the variables, then the author will dismiss WH1. If the results of the three correlation tests show a significant negative relationship between the variables, then the author will support WH1. If the results of the three correlation tests are mixed, the author will partially support WH1.

For WH2, the author will perform a Correlation r test for each of the two sub-hypotheses. For WH2a, the test will assess any relationship between observed differences in the level of development sprawl over time and the frequency of annexations over time. For WH2b, the test will assess any relationship between observed differences in the current level of development sprawl and the frequency of future annexations. If the results of the two tests show a negative or weak positive relationship between the variables, then the author will dismiss WH2. If the results of the two tests show a significant positive relationship between the variables, then the author will support WH2. If the results of the two tests are mixed, the author will partially support WH2.

For WH3, the author will perform a Correlation r test for each of the four sub-hypotheses. For WH3a, the test will assess any relationship between observed differences in current level of development sprawl and support for regional transportation infrastructure planning. For WH3b, the test will assess any relationship between observed differences in the current level of development sprawl and support for regional police and fire protection services provision. For WH3c, the test will assess any relationship between observed differences in current level of development sprawl and support for regional land-use planning. For WH3d, the test will assess any relationship between observed differences in current level of development sprawl and

general esteem for regional government. If the results of the tests for WH3a and WH3d show a negative or weak positive relationship between the variables and the results of the tests for WH3b and WH3c show a relationship between the variables, then the author will dismiss WH3. If the results of the tests for WH3a and WH3d show a significant positive relationship between the variables and the results of the tests for WH3b and WH3c show no relationship between the variables, then the author will support WH3. If the results of the four tests are mixed, the author will partially support WH3.

The results of the Correlation r tests are tempered due to a weakness inherent in the test. Correlation r 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 will be analyzed in the context of previous scholarly research findings and the descriptive statistics of the current study's survey data.

TIME TABLE FOR COMPLETION

Table 3 presents the time table for completion of the applied research project. Instructor deadlines as well as self-imposed deadlines are included.

TABLE 3
TIME TABLE FOR COMPLETION OF ARP (2003)

Prospectus (Dr. Shields)	August 11
Pre-test surveys	August 25
Literature review chapter (Dr. Shields)	September 10
Progress report (Dr. Shields)	September 10
E-mail surveys	September 15
Introduction chapter	September 15
Surveys due	September 22
E-mail second request for surveys	September 24
Setting Chapter	September 29
Title of ARP to MPA Office (Dodie)	September 30
Surveys due for second request	October 1
Code and compile survey data	October 5
Methodology chapter	October 5
Data analysis	October 12
Results chapter	October 19
Conclusions chapter	October 19
First draft of ARP (Dr. Shields)	November 3
Revised draft (Committee)	1 week before oral exam
Oral Exams	December 4-10
Paper due to office – electronic and bound (Dr. Shields)	December 17

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Attachment A

Please complete the following questionnaire items.

City: _____

Please circle the best response to the following items.

1. Over the past five years, development sprawl 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 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 regional government is favorable. ..... SA A N D SD

9. Regional government should play a role in transportation infrastructure planning.	SA	A	N	D	SD
10. Regional government should play a role in the provision of police and fire protection services.	SA	A	N	D	SD
11. Regional government 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 by:

- **e-mail (rjeffers@tml.org);**
- **fax (512-231-7472); or**
- **regular mail (5404 Westminster Drive, Austin, TX 78723).**

If you have any questions, please contact Rachael Jeffers at 512-231-7472.