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State "Smart Growth" Policies: A Cure for Dumb Urban Growth?

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To the Graduate Council:

I am submitting herewith a dissertation written by Jacqueline N. Mitchell entitled "State "Smart Growth" Policies: A Cure for Dumb Urban Growth?." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Political Science.

Anthony Nownes, Major Professor

We have read this dissertation and recommend its acceptance:

Pat Freeland, Bruce Tonn, Bill Lyons

Accepted for the Council:

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Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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STATE "SMART GROWTH" POLICIES:
A CURE FOR DUMB URBAN GROWTH?

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Jacqueline N. Mitchell
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DEDICATION

This dissertation is dedicated to my family, a constant source of encouragement and comfort: to my husband and best friend Jason, who selflessly provided me with all the support and cheerleading needed to write a dissertation; and to my parents and brother, who inspired me to go anywhere and do anything I wanted to, yet always kept home a wonderful place.

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ABSTRACT

The purpose of this research is to investigate the effects of state initiated smart growth legislation on various aspects of the phenomenon known as urban sprawl. Sprawl is associated with a number of undesirable conditions including depletion of natural resources, increased traffic congestion, and loss of residents and businesses in inner city areas.

In an attempt to alleviate and prevent these conditions, some states have implemented smart growth legislative programs. These programs vary in form from comprehensive in nature, or extending to all land use activities; to pertaining only to special areas, such as coastlines. In addition, state legislation varies according to the balance employed by the state between coercion and incentives used to obtain local government compliance. Utilizing a combination of existing classification systems for state smart growth legislation, I developed a model that incorporates the two elements described above. Based on the "proposed model", I selected three cities in three states to evaluate. I selected Baltimore, MD to represent low-coercion/comprehensive general; Atlanta, GA to represent medium-coercion/comprehensive general; and Orlando, FL to represent high-coercion/comprehensive general. My rationale was that change could best be observed at the city level.

I selected variables for testing within these cities based on the five primary objectives of smart growth. In each city, I evaluated whether or not there was a change in certain variables (air quality, for example) after implementation of the respective state program. I determined which city showed the most improvement in terms of the dependent variables, and then I extrapolated my findings to the state level.

I reached a preliminary conclusion that the more coercive a state's smart growth legislative program is, the more likely it will be effective at the local level. I based this on data results for the city of Orlando, FL, which were generally more in line with smart growth goals than those of Baltimore and Atlanta. In fact, Orlando was more successful with controlling population density, maintaining air quality, and minimizing roadway congestion. It is also important to note that Atlanta, the test city with the next highest level of coercion, scored second best. These findings are of particular interest given that the trend for the last ten to 15 years has been for states to implement less coercive smart growth programs.

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THE EVOLUTION OF URBAN SPRAWL IN THE UNITED STATES

Introduction

One of the perennial challenges for local governments is how to encourage responsible growth while minimizing problems that often accompany growth (Burby and May 1998; Freilich 1999; Garreau 1991; Popper 1981; Stein 1993; Weitz 1999). A growing population and economy are desirable for cities because of the subsequent benefits (Briechle 1999, Hudnutt 1998). Those may include an increased tax base, creation of jobs, and economic stimulation of local retail and entertainment venues. However, economic growth may also be accompanied by rapid expansion in the land area of a community, depletion of natural resources, increased traffic congestion, and loss of residents and businesses in the inner city area. These undesirable conditions are all associated with "urban sprawl", perhaps the most widely cited problem related to rapid or uncontrolled urban growth (Anderson and Tregoning 1998).

Consequences of Urban Sprawl

Urban sprawl refers to a variety of possible conditions that may arise when growth is not managed in a way that utilizes existing infrastructure, or that takes into account the natural features that make a community one-of-a-kind. Sprawl is associated with low-density development outside of an established urban core. Development of this kind may engulf neighboring communities, destroy natural resources, and reinforce the reliance on personal automobiles for transportation (Beaumont, ed. 1999, Briechle 1999, Mitchell 2001).

Atlanta, Georgia is an example of a city that has experienced sprawl and its associated challenges. According to U.S. Census data, Atlanta has spread outward so that it now occupies a total of 701.7 square miles. In addition, per capita land consumption in Atlanta is .337 acre (Bureau of Census "State" 2004). This means that it takes over one-third of an acre to provide the average resident of Atlanta with space for housing, work, recreation, and other needs ("Per Capita" 2000).

When communities sprawl, existing infrastructures are underutilized, often while new systems are built simultaneously elsewhere. The most common situation is that water and electrical systems in older urban centers fall into disuse while whole new systems are built in rapidly expanding suburbs. This is an expensive problem, because the city must raise money to pay for the new infrastructure (Mitchell 2001).

Environmental degradation is another negative aspect of unmanaged growth. The migration of residents to newly built developments in urban fringe areas has the consequence of shrinking the supply of open space and valuable farmland, and may threaten wetlands or alter environmentally sensitive areas (Bullard 2000). Increased runoff caused by more pavement, roadways, and roofs increases the volume of storm water and contributes to non-point source pollution of streams, rivers, and lakes. Development in areas away from urban infrastructures results in placement of septic systems in areas that could pose problems for aquifers and groundwater resources (Anderson and Tregoning 1998). Pollutants from expanding local governments may also include oil leaked from cars and lawn care chemicals. Contamination of natural water sources, soil erosion, flash flooding, and increased air pollution are all possible consequences of rapid, unplanned urban development (Sierra Club 2001, Sorensen et al. 1997).

Transportation and traffic problems also are associated with unplanned growth. First, as suburbs creep further and further from the original urban center of a city, citizens are often forced to drive long distances to get to work. Baldassare (1986) argues that as suburbs have continued to expand, this situation has evolved into another problem. His concern is that workers who commute between suburbs utilize roadways that were not designed to handle high volume traffic. According to Baldassare, the resulting traffic congestion in suburbs is different than that in cities. The lack of a central geographic focus in the suburbs makes no massive rush hour jams, but has less predictable and more widely diffused congestion.

Another aspect of urban sprawl with consequences for transportation is the design of these new suburbs. The typical arrangement within suburbs today is a "separation of uses". This means that shopping, recreation, and residences are all in separate locations. The result is that people have to drive more to accomplish daily tasks. Not only is increased traffic congestion a serious problem, but increased gasoline usage results as well (Giuliano and Wachs 1993).

Aesthetic and social consequences are also associated with sprawling communities. One serious problem is that the unique features of an area that first attracted residents may be changed as a result of the growth. What was once "one of a kind" may become indistinguishable from development elsewhere. Outward expansion also often leaves a community with no town center. Some concerned scholars (Mitchell

2001, "Problems" 2000) argue that as the heart of a community, or the town center dies, civic values also decline. They believe that when there are no longer common meeting places, people become isolated and anti-social (Mitchell 2001, "Problems" 2000).

Origins of Sprawl

Some scholars argue that policies instituted by the federal government had the effect of encouraging sprawl. The federal government began giving land grants to railroad companies in the mid-1800s. This had the effect of slowly expanding America's inhabited regions to include those previously unreachable and inhospitable areas (Freilich 1999, Hill 1910). The Housing Act of 1934 also encouraged sprawl. The act was ostensibly created to improve housing conditions throughout the country. Loans were made readily available to homebuyers anxious to achieve the "American dream", and small home construction was used as a means of creating jobs for unskilled laborers. The result, however, was to move the middle class out of cities and into the suburbs. In 1956 the national government continued to encourage sprawl by passing the Federal-Aid Highway Act, which created the interstate system. President Eisenhower observed that: "More than any single action by the government since the end of the war, this one would change the face of America" ("The Roots" 2001 quoted p. 1). The effect of interstate highways was to make undeveloped areas more accessible. This in turn encouraged residential and commercial development in rural areas (Giuliano and Wachs 1993, Popper 1981, "The Roots" 2001).

State governments indirectly contributed to sprawl by enacting enabling legislation that gave local governments the authority to manage growth themselves through zoning, ordinances, subdivision regulations, annexations, and other means (Freilich 1999). In fact, local government has historically been the level where most land use policies have been formulated. In spite of this, for much of the twentieth century, many communities were unable or unwilling to address or resolve the issue of promoting growth while minimizing its potentially deleterious consequences. In many cases, urban growth occurred without a deliberate planning effort and without regard to possible negative consequences (Cullingworth 1997).

Critics have charged that many local governments made at least two critical mistakes that led to some of the consequences of urban sprawl. One criticism is that zoning, one of the most widely used tools to regulate growth, was used in a reactive manner rather than in a proactive way to implement a growth plan. Unlike a comprehensive land use plan, zoning results in many individual and unrelated decisions regarding lots. The results of decades of zoning decisions often are widespread, haphazard development patterns, inefficiency of services, and waste of resources (Burby and May 1997, Porter 1997).

The second problem is that local governments often make plans and decisions without consulting or cooperating with neighboring local governments. At the beginning of the twentieth century, when communities were small and distant from one another, unilateral planning was a necessity. Contemporaneous issues like traffic flow, pollution control, and environmental conservation are not contained within boundaries, however, and therefore require cooperation between neighboring communities (Briechle 1999, Smith 1993, Stein 1993).

Introduction of State Control

Beginning in the early 1970s, as a result of the perceived inadequacies of traditional growth control tools, some states began to regulate urban growth at the local level (Liou and Dicker 1994). In fact, prior to that time, the only real land management function exercised by most states was the operation of state parks and recreation areas (Platt 1991). This change from exclusive control by local authorities to some degree of control being exercised by some states is referred to as the "quiet revolution" in land use planning. A primary reason for this renewed interest among state leaders concerned the growing awareness and lobbying efforts of citizens and interest groups regarding the results of poorly planned growth (Porter 1998, Morandi 2000, Weitz 1999).

The policies being adopted by the states were eventually labeled "smart growth" because they had the dual intentions of encouraging healthy economic growth while discouraging environmental damage (Leo et al. 1998). There is considerable confusion as to who first developed the term smart growth. A review of the literature indicates at least three possibilities. Various sources claim that Roy Romer, former governor of Colorado first coined the term ("Colorado" 1999, Casini 1999). Parris Glendening, former governor of Maryland may have created the term (Smith 2000, Jellema 2000). Still other sources cite the state of Massachusetts as the birthplace of the term smart growth (Flint 2001, "Government" 2004).

Understanding Smart Growth

Differentiating smart growth from previous attempts at growth management is not easy. There is no single, widely accepted definition of smart growth. Rather, a review of the literature indicates various "definitions" of this approach, which read more like descriptions. The Environmental Protection Agency defines smart growth as "high density, mixed use, transit oriented development" (Staley 2000). According to Bierbaum (2001), some characteristics of smart growth policies are control of outward migration of residents, urban area revitalization, design innovation, land and natural resources preservation, transportation reorientation, and equitable access to affordable housing. According to the Urban Land Institute (1998), smart growth policies enhance the sense of community, protect the investment in existing neighborhoods, protect environmental quality and conserve open space, decrease traffic congestion by providing alternative forms of transportation, and make efficient use of public money.

While dozens of different descriptions of smart growth may be found in the literature, there are certain points that are agreed upon (Staley 2000). One is that smart growth is meant to counteract urban sprawl. Proponents seek to promote economic growth while also protecting environmental resources and open spaces. In all cases, smart growth attempts to make the link between a beneficial kind of development and improved quality of life (Godschalk 1992, Innes 1993, Merriam 2003). Affordable housing for people at all income levels is also important because it keeps populations from segregating or being forced to move (Danielson and Lang 1998). Smart growth also generally requires some sort of centralized plan, either at the state, regional, or local level. It is clearly important for communities dedicated to smart growth to stick to a preconceived growth plan rather than being swayed by developers or other interests to enact zoning changes. Lastly, smart growth is a collaborative effort. Local governments must work together in their planning so that issues like traffic flow and pollution can be managed at a regional level (Briechle 1999, Hudnutt 1998).

Smart growth legislation takes various forms. In Tennessee, growth boundaries are used. All counties and municipalities in the state are required to develop recommended growth plans for areas that will be designated as urban growth areas, planned growth areas, and rural areas (English and Hoffman 2001). Oregon utilizes growth boundaries similar to those developed in Tennessee and it also uses intergovernmental coordination techniques. Cities in Oregon are required to coordinate plans with their respective counties, special districts, state agencies, and the Oregon state plan. California, on the other hand, has an issue-based approach to smart growth. The state does require local governments to develop plans, but the contents of the plans are specific and reflect the state's concern with environmental protection as well as with population controls. Local governments in California must address land use, housing, conservation, and safety (Freilich 1999).

As of July 2004, sixteen states have instituted some kind of smart growth legislation. These include Arizona, California, Colorado, Florida, Georgia, Hawaii, Iowa, Maine, Maryland, New Jersey, Oregon, Rhode Island, South Carolina, Tennessee, Vermont, and Washington (Bolen et al. 2001, Cobb 1999, Freilich 1999, Innes 1993, Johnson 2002). At least another four are considering similar legislation. These states are New Hampshire, New York, Utah, and Wisconsin ("State Incentive" 2004).

Much of the recent growth literature details the benefits of this type of state intervention (Bolen et al. 2001, Cobb 1999, Johnson 2002, Smith 1993). Despite the high level of support for the theoretical justification of state intervention, the limited number of studies that have been conducted to evaluate the success of these initiatives have had mixed results. At this point research in this area is inconclusive as to whether state smart growth legislation has been successful at controlling or reversing some of the conditions associated with urban sprawl described above (Burby and May 1997; Porter 1998).

Purpose of Research and Methodology

The purpose of this research is to investigate the effects of state initiated smart growth legislation. To this end, I have four primary objectives. The first is to develop a working definition of "smart growth". I will begin by providing a brief historical review of growth control and land use policy enacted at each of the three levels of government. In developing the definition, I will explore what kinds of policies states have adopted to promote smart growth.

The second objective is to identify the major types of state smart growth legislation. Based on the definition of smart growth developed, I will establish certain criteria in order to determine what laws include smart growth components. I will group state laws in terms of similar characteristics so that a model for classifying legislation can be developed. The "new" typology will be based on improvements to existing models.

The third objective is to assess the impacts of the primary types of smart growth legislation identified by the model on promoting smart growth at the local level. A detailed discussion of methodology employed is provided in Chapter IV. Based on the classification system, one city in each of three representative states will be selected for the study. Numerous dependent variables will be tested as indicators of smart growth, the independent variable. For example, I will examine the trend in traffic congestion, a *y* variable, both before and after state smart growth, the *x* variable, was adopted. I will determine whether changes are seen for each dependent variable after the state law was implemented, and whether those changes may be attributed to state legislation.

The final objective is to determine which category of smart growth legislation appears to be most effective based on the test of cities. These conclusions will be preliminary, based on the evidence collected. Limitations will be further discussed in Chapters IV and V.

Potential Contributions to the Literature

The primary contribution of this research will be to define, classify, and study the effects of smart growth legislation passed by the states. Numerous definitions or descriptions of smart growth exist in the literature. I will compile and synthesize the most useful ones into a single definition. In addition, the proposed typology will be a more comprehensive classification than what is currently available in the literature because it will combine various dichotomous classifications. Lastly, I will use the data analysis to extrapolate which type of state legislation appears to be most effective in achieving the goals of smart growth. While the results will be preliminary, they may be added to the developing body of scholarship on this topic. This is important, because currently, research on the effectiveness of state smart growth policies is inconclusive (Burby and May 1997, Leo et al. 1998). Most of the literature on this topic consists of case studies or polemics that tout the merits of more centralized policy making to regulate growth and minimize urban sprawl (Bierbaum 2001, Nelson and Moore 1996). Little unbiased, systematic investigation of smart growth legislation has been conducted. This may be because state smart growth legislation is not an easy subject to study. One reason for this is because most smart growth legislation only ten or fifteen years old. The types of outcomes that the laws should produce are slow and evolutionary in nature. Real changes resulting from the laws are only just now beginning to be seen in many places (Burby and May 1997).

CHAPTER II

CLASSIFICATION OF STATE INITIATED SMART GROWTH LEGISLATION

A Definition of Smart Growth

In order to examine smart growth at the state level, an operational definition must be developed for the term. As stated in the previous chapter, this is no simple task because existing definitions are vague and vary widely from one another (Bierbaum 2001, Mitchell 2001, Nolon 2001). Popper (1981) argues that within the legislative arena, an understanding of smart growth must be kept vague in order to garner necessary support for the measures from both Democrats and Republicans. Outside the legislative arena, even land use and planning experts do not agree on exactly what constitutes smart growth (Bierbaum 2001).

The Roots of Smart Growth: Growth Management

Examining the roots of smart growth enhances an understanding of this concept that is difficult to define. A number of authors agree that smart growth stems from the growth management movement that began in the 1960s (Merriam 2003). An explanation of growth management is somewhat easier to provide than an explanation of smart growth, because authors largely agree on what constitutes that concept (Cullingworth 1997, Freilich 1999, Godschalk 1992, Innes 1993, Merriam 2003, Porter 1997, Steel and Lovrich 2000). According to Stein (1993), "Growth management planning, in all its varied forms, basically involves using government regulatory powers in a comprehensive, rational, coordinated manner to meet public objectives for balancing economic growth with the protection and preservation of our natural and manmade systems" (quoted p. *vii*). DeGrove and Metzger (1993) state that growth management "is a comprehensive concept, concerned not only with the physical impacts of growth but with the economic and social impacts as well" (quoted p. 1).

Growth management is a governmental process that involves many interrelated aspects of land use. According to Godschalk (1992, quoted p. 423), "the hallmark of growth management is its balance among competing objectives". It is not restricted only to channeling urban growth in beneficial directions. Growth management includes a prohibitive element- in other words; farmland and other fragile environments must be protected against some or all types of development. At the same time, growth management plans promote development in other areas, such as housing and transportation (Cullingworth 1997). Above all, a growth management plan must take a variety of issues into account so that no single area, such as affordable housing or natural resource management, is neglected or harmed (Weitz 1999).

In the next few sections, the smart growth movement will be examined in terms of the values associated with it, the variety of strategies employed to achieve it, and the individual goals that these strategies are meant to achieve. What must be concluded from this discussion is that the smart growth movement is "something less than a bold new horizon" (Bierbaum 2001). It is not a radically new and different concept, nor has it revolutionized the planning profession. Rather, the objectives and goals associated with smart growth have been in existence since at least the start of the growth management movement that began in the 1960s. (Jeffords 2000) In short, the growth management plans of earlier decades have been conveniently repackaged and sold to scholars, politicians, environmentalists, and concerned citizens as smart growth.

Values Associated with Smart Growth

The basic elements of growth management became incorporated into the smart growth movement (Godschalk 1992, Innes 1993, Merriam 2003). The two concepts share a focus on economic development as well as environmental protection. Both may also include attention to a wide variety of planning issues- from transportation management to revitalization of inner cities. Neither of these approaches is restricted to land use management alone (Briechle 1999, Burby and May 1997).

While smart growth is more difficult to define, a review of the literature suggests that a number of values are associated with it. Most scholars agree that smart growth is beneficial to the economy, the community, and the environment (Anderson and Tregoning 1998, Audubon 2001, Beaumont 1999, Briechle 1999). Allusion to a construction project as "smart" means that it is beneficial in all three of these ways- to the economy, the community, and the environment. Smart growth should not be confused with "no growth" agendas (Anderson and Tregoning 1998, Beaumont 1999, McMahon 1997). Indeed, smart growth activists recognize the critical role that development plays in maintaining and improving communities (Audubon 2001).

What apparently distinguishes smart growth from other growth initiatives is the linkage between quality of life and development patterns and practices (Audubon 2001). Merriam (2003) asserts that the bedrock principle of the movement is that "good planning and appropriate regulation are essential to protecting the public's health, safety, and general welfare" (quoted p. 2). Smart growth initiatives incorporate these aspects in a variety of ways. For example, smart growth plans often contain a transportation element. Providing citizens with alternative modes of transportation may lessen traffic congestion caused by reliance on cars. Such action might also have the "smart" effects of decreasing air pollution and making the community more inviting to pedestrians. A smart growth plan might seek to maintain a small town's character and charm while accommodating new residents and a prospering economy. Another common element of a smart growth plan is to channel new commercial growth into the partially abandoned urban core of a city rather than building and financing new infrastructure elsewhere (Anderson and Tregoning 1998).

Variation in Smart Growth Strategies

While the values associated with smart growth are generally agreed upon, there is no large-scale uniformity as to how these values may be implemented ("Around" 2001, Jeffords 2000, Porter 1997). In states that have adopted smart growth legislation, programs are unique in part due to the extent of some particular perceived environmental crisis (or lack thereof) (Cullingworth 1997, Popper 1981). For example, degradation of wetlands in Florida might stimulate different action than would air pollution in Tennessee's Smoky Mountains.

Another factor that produces variation in smart growth initiatives is the political climate of the state. Smart growth programs involve a larger role for government in the development process. As a result, Democrats are often more likely to be supportive of these efforts than are Republicans, who generally wish to limit government intervention in economic affairs (Hylton 2001, Schneider "The New" 2001, Schneider "White" 2001). A state that is progressive in terms of environmental protections and planning, such as Oregon, might produce different smart growth programs than would a less progressive state, like Georgia, for example (Beaumont 1999, Cullingworth 1997, Popper 1981). In addition, DeGrove (1990) has shown that usually, in order for smart growth legislation to "have teeth", it needs gubernatorial support. Governor Parris Glendening (1999) of Maryland was especially supportive of smart growth measures in his state, which certainly helped Maryland to become a "model" smart growth state, according to advocates (Bierbaum 2001).

Finally, the social culture of a state is an important determinant of the form that smart growth might take in the legislature (Innes 1993, Porter 1997). States that include large rural areas often perceive government regulation of land and development as unwanted, unjustified interference, or, even "communist" in nature (McMahon 1997). Another pertinent social factor is the extent of citizen interest and activism in a state (Jeffords 2000). This has particularly affected legislation in California, which has a vocal, pro-active citizenry (Cullingworth 1997, Steel and Lovrich 2000).

The Goals of Smart Growth Strategies

A review of the literature reveals a wide diversity of strategies for achieving the goals of smart growth policy. These strategies may be organized under five primary goals, or objectives. These objectives are to: (1) revitalize central cities, (2) control development, (3) create and improve transportation options, (4) protect natural resources, and (5) create equitable, desirable neighborhoods. Each one of these may be accomplished through the incorporation of numerous initiatives by local governments (Anderson and Tregoning 1998, Audubon 2001, Merriam 2003, Sierra "Sprawl" 2001). A sampling of the most common types of initiatives is provided below. The goals are italicized, while examples of means of achieving them are lettered.

The Goals and Elements of Smart Growth

1. *Revitalize central cities*
   - A. Encourage investment/reinvestment in central cities and older suburbs
   - B. Encourage location of major new regional attractions in central cities
   - C. Encourage infill development
   - D. Revitalize areas by reducing poverty and crime and improving schools
2. *Control development*
   - E. Develop new communities in areas that can be efficiently serviced
   - F. Establish growth boundaries for metropolitan areas
   - G. Encourage/Require local governments to prepare comprehensive growth management plans
   - H. Reverse government programs/tax policies that create sprawl
   - I. Increase population density to prevent sprawl
   - J. Prevent new development in disaster prone areas
3. *Create and improve transportation options*
   - K. Direct transportation funds to existing communities
   - L. Create higher density development around transit
   - M. Reduce overall highway traffic congestion
   - N. Make available transportation options such as walking, biking, public transportation
4. *Protect natural resources*
   - O. Preserve open space, forests, and scenic areas
   - P. Conserve environmentally sensitive areas
   - Q. Conserve farmland
   - R. Enforce clean air and water standards
5. *Create equitable, desirable neighborhoods*
   - S. Create affordable housing options
   - T. Incorporate New Urbanism planning guidelines
   - U. Encourage mixed-use development
   - V. Maintain local community character and identity

In the following sections, I will discuss each of these goals and the means of achieving them, in detail.

Revitalize Central Cities

A common goal of smart growth legislation is to revitalize central cities, or the urban cores of communities (Anderson and Tregoning 1998, Beaumont 1999, Jeffords 2000, "Sprawl Guide" 2000). When there is reinvestment and redevelopment in an existing community, the local government saves money by not having to finance new infrastructures (Audubon 2001). In addition, some amount of sprawl is prevented and the once vital downtown does not become an abandoned ghost town. Governments at various levels can encourage investment and reinvestment in central cities and older suburbs by offering incentives to businesses and residents willing to locate there (Anderson and Tregoning 1998). A related strategy is for local governments to encourage "infill development". This is development that fills in vacant or underused land in existing cities with new development that blends in with its surroundings (Beaumont 1999, Audubon 2001). Another smart strategy is to plan the location of major new regional attractions in central cities (Anderson and Tregoning 1998). Chattanooga, Tennessee, for example, was able to create a once again vibrant downtown area in part by locating an aquarium in the area. Governments can also make older suburbs and urban areas more inviting to residents and businesses alike by concentrating on reducing crime and improving schools in those areas (Sierra "Sprawl" 2001).

Control Development

Regulating development is another critical facet of smart growth policy. A by-default city or county planning policy consisting of an amalgam of zoning decisions is not acceptable to advocates of smart growth (Cullingworth 1997, "Planning" 2001).

Instead, advocates (Audubon 2001, Beaumont 1999) argue that a number of strategies can be used to pro-actively encourage economic growth while accommodating the needs of both citizens and the environment. One strategy is to disallow new development in disaster prone areas, such as floodplains and coastal areas. Tremendous financial losses can be avoided altogether by not building houses in floodplains, for example (Sierra "Sprawl" 2001). Another strategy is to develop new communities in areas that can be efficiently serviced. With "leapfrog" development, or new housing developments that spring-up in rural areas made newly accessible by interstates, often new roads, water systems, and schools have to be created to service the new residents. Another smart growth strategy is to have developers themselves pay impact fees when new roads, schools, etc. must be constructed (Cullingworth 1997, Sierra "Sprawl" 2001).

An increasingly popular method used by states to regulate and restrict development is requiring, or, at least encouraging, local governments to prepare comprehensive growth management plans. Often the establishment of growth boundaries for metropolitan areas is a part of these plans (Audubon 2001, Sierra "Sprawl" 2001).

Finally, smart growth advocates recommend that governments reverse programs and tax policies that have historically encouraged sprawl (Sierra "Sprawl" 2001). For example, some communities require residential roads to be wider than other kinds of roads. A smart growth strategy is to narrow residential streets, in order to slow traffic and make neighborhoods more inviting to pedestrians (Anderson and Tregoning 1998, "Sprawl" 2001).

Create and Improve Transportation Options

A third important goal of smart growth is to create smarter transportation options. A large part of this involves trying to reduce individuals' reliance on automobiles (Anderson and Tregoning 1998, Audubon 2001, Beaumont 1999, Jeffords 2000). Smart growth advocates argue that doing so reduces pollution from car emissions, alleviates some degree of traffic congestion, and makes a community more pedestrian friendly, which in turn attracts some new residents by creating a small-town atmosphere ("Sprawl Guide" 2000). One strategy for accomplishing this is to create higher density development near transit- such as subways, bus lines, etc (Anderson and Tregoning 1998, Sierra "Sprawl" 2001). The logic of this strategy is that if public transit is convenient to individuals, they will be more likely to take advantage of it. Another strategy is to plan communities so that residents have a variety of transportation options available to them. Possibilities include walking, biking, and public transportation (Audubon 2001, Beaumont 1999). Walking or biking from home to the grocery store, or from home to work is not a realistic option in most suburban communities today. Rather, the strict separation of uses and heavy traffic usually helps to reinforce a reliance on cars for even basic errands ("Sprawl Guide" 2000).

Advocates of smart growth (Audubon 2001, Jeffords 2000, Sierra "Sprawl" 2001) also recommend leveraging state and federal transportation funds to encourage the kinds of changes described above. Transportation funds available to local governments can be restricted for use in existing communities. This strategy has the dual effects of causing local governments to reinvest in existing suburban and urban areas, and reducing sprawl by not creating new highways (Anderson and Tregoning 1998). Research has shown that in many instances, construction of new roads in order to alleviate congestion on existing roads does not work. In fact, it usually encourages more traffic and more development in areas made accessible by the new roads (Sierra "Sprawl" 2001).

Protect Natural Resources

Protection of natural resources is an important part of smart growth. Activists seek to preserve air and water quality, open spaces, forests, and scenic areas (Anderson and Tregoning 1998, Audubon 2001, Beaumont 1999, Jeffords 2000). Initiatives of this type are important for environmental reasons, such as protecting nesting birds in woodlands, and they are important for retaining the unique character and appeal of an area to its residents (Beaumont 1999, "Sprawl Guide" 2000). Smart growth activists also often attempt to conserve environmentally sensitive areas, such as coastlines and wetlands (Audubon 2001, Beaumont 1999). Areas such as wetlands perform unique functions, like filtering impurities from the water supply and acting as a sponge to absorb excess precipitation. Developing wetland areas may contaminate groundwater supplies and contribute to flooding (Reagin 2002). Another smart growth strategy is to conserve farmland by planning for and encouraging development in other areas (Anderson and Tregoning 1998, Beaumont 1999). Experts state that after farmland has been developed, it can eventually be returned to a natural state, but it can never regain the rich crop producing potential it once had (Cullingworth 1997).

Create Equitable, Desirable Neighborhoods

A fifth primary objective of the smart growth movement is to make neighborhoods themselves "smarter". A basic part of this goal lies in developing neighborhoods that residents can live, play, work, and shop within (Beaumont 1999). This is the concept of "mixed-use" development (Audubon 2001). Conventional suburban development employs a strict separation of uses. In other words, grocery stores and other shopping venues are located away from residential areas. Individuals in conventional suburbs must often drive to widely dispersed locations in order to get to their jobs, places of recreation, and churches. The legal separation and isolation of land uses originated as a means of protecting citizens. Dangerous, foul smelling, and unsightly practices, such as tar boiling and fat rendering, were restricted to locations away from residences. Children were also protected from commercial and industrial traffic (Nolon 2001). Planners assert that this well-intentioned practice eventually served to reinforce suburban sprawl in the US (Gerckens 1994). According to smart growth advocates (Audubon 2001, Beaumont 1999), mixed-use neighborhoods would decrease dependence on cars and increase the quality of life for residents by making their daily experiences less stressful or aggravating.

A second smart growth strategy for making smarter neighborhoods is maintaining local community character and identity within the development process (Anderson and Tregoning 1998, Beaumont 1999). Smart growth advocates argue that one of the unfortunate consequences of sprawl is that over time, areas that were once unique become indistinguishable from other places. This is largely because the absence of a calculated growth plan by local governments allows for the flourishing of conventional “cookie cutter” suburban neighborhoods. One of the methods recommended for maintaining local community character is the adoption of New Urbanist planning guidelines (Anderson and Tregoning 1998, “Smart” 2001). New Urbanism is the area of planning most closely associated with smart growth. Aspects of New Urbanism design include developing a town square, or other central meeting point in a community, locating playgrounds within ¼ mile of any home, and situating houses near the street with the garage in back of the house accessible by an alley (Steuteville 2000, Schneider 2001). Proponents argue that incorporating these features into a neighborhood enhances a healthy sense of community.

Smart growth advocates also argue that to improve neighborhoods, housing must be made available to residents of every income level (Anderson and Tregoning 1998, Audubon 2001). This means that there must be a mix of housing options in an area, including single-family homes, apartments, and duplexes, for example. One of the goals of this recommendation is to remedy the type of housing segregation that exists in many communities and is associated with sprawl. Often lower income families are forced to live in inner cities where rents are cheaper, while wealthy and middle-class families move further and further into the suburbs (Katz and Bradley 1999). Besides the implications for individual civil rights, such segregation has secondary effects (Rusk 1993). There may eventually develop a mismatch between available workforce and potential jobs. When a community sprawls, new growth emerges further and further away from what was once the urban core. Supermarkets, specialty shops, professional practices, and entertainment venues all may open new sites in the outer ring suburbs, and close sites in the city. These establishments require low wageworkers that live primarily in the older urban areas. Businesses eventually suffer from not having enough low line employees. Meanwhile, those potential workers forced to remain in the old city areas have trouble finding jobs (Rusk 1993). Middle class and wealthy suburbanites, on the other hand, are often forced to drive from suburbs back into the city, where their higher paying positions are located (Walljasper 2001).

Criticisms of Smart Growth Techniques

While smart growth is a popular approach in many communities today, a review of the literature also reveals substantial criticism toward the concept. Some critics challenge the assumptions underlying the need for smart growth policies, while others challenge the methods associated with achieving smart growth. Still others are critical of the results achieved by smart growth legislation.

A number of scholars (Bishop and Tilley 2002, Gordon and Richardson 1998, Staley 2001) who are critical of smart growth argue that the environmental crises that generally precede such legislation are usually misunderstood, exaggerated, or nonexistent. Staley (2001), for example, challenges popular notions that development in the U.S. is systematically reducing valuable farmland. He argues that only 6% of the total U.S. land area is actually developed. Furthermore, he argues that three quarters of the American population live on less than 4% of the total land area. He believes that the consequence of these conditions is that most citizens have a skewed understanding of how much land is actually developed, and how much remains undeveloped. Farmland, he concludes, is not being lost to development. Rather, increasing agricultural productivity and technology result in fewer farming acres being needed in the U.S. each year (Staley 2001). Skeptics of the statistics supporting the need for smart growth, such as Staley, have referred to the alleged loss of prime farmland as "the most conclusively discredited environmental-political fraud of recent times" (Gordon and Richardson 1998, quote by Julian Simon p. 23).

In addition to challenging the statistics that are used to support smart growth initiatives, other critics challenge the methods of achieving smart growth. The greatest challenge comes from individuals who argue that the market could correct for all or most of these problems if it was given the chance (Bishop and Tilley 2002, Gordon and Richardson 1998, Staley 2001). Smart growth generally requires government intervention. Some people argue that government interference in areas such as land management and transportation management not only truncates the market economy's ability to respond to the problems, but it also creates new problems. Markets, it is argued, are much more effective at registering the preferences of individuals, than is centralized planning by government (Bishop and Tilley 2002, Gordon and Richardson 1998, Staley 2001).

One scholar (Green 2001) argues that smart growth initiatives that force developments of higher densities have the effect of worsening pollution problems. This view asserts that before government intervention of this sort, when market preferences alone determined densities of developments, it gradually became clear that individuals preferred single family homes on moderate sized suburban lots. Under smart growth initiatives, it is argued, not only are individuals forced to live in denser communities than they prefer, but the environment is also put at greater risk. One alleged consequence is that denser development reduces the ability of the natural environment to absorb pollutants. For example, in dense communities, storm water that includes pollutants from roadways may not be adequately absorbed into the ground, but may instead cause some localized flooding (Green 2001).

Another major criticism of smart growth initiatives is related to the rational choice planning components included in these programs. Some opponents of smart growth legislation, drawing on research from Herbert Simon (1946) and Charles Lindblom (1959), argue that planners "muddle through" decision-making processes with incomplete information, and then adopt plans only after they have already acted. These critics charge that the limited rationality of planners and other government officials renders their resulting plans to nothing more than a conglomeration of convenient, opportunistic, and haphazard decisions. Furthermore, some critics charge that the plans of local governments are largely ignored (Burby and May 1997).

An Operational Definition of Smart Growth

A working definition of smart growth is a prerequisite to the study of smart growth legislation initiated by the states. The literature provides no single useful (operational) definition of the term. Existing definitions are vague and descriptive in nature because smart growth is a fairly new term, even experts do not agree on a definition, and because initiatives vary widely in different communities (Bierbaum 2001, Briechle 1999, Nolon 2001). Another complication is that the term smart growth may be used in different ways. A single initiative may be considered smart growth, or the term may refer to the intended effects of a collection of pieces of legislation. For example, a law requiring that necessary infrastructure is in place before new development may be built may be considered smart growth because it satisfies the three-pronged test discussed earlier- it is beneficial the economy, the environment, and the community. On the other hand, in the case of California, for example, reference to the state's smart growth program may include dozens of individual pieces of legislation.

I believe that smart growth should not be so difficult to define because it is essentially growth management updated. The concept of growth management, with all of its interrelated parts (including land use management, natural resource conservation, transportation and housing issues), gradually transformed into the smart growth movement beginning in the early 1990s (Godschalk 1992, Innes 1993, Merriam 2003). This happened for a number of reasons. One reason was that the movement gained advocates who had not previously been overtly supportive of the measures. Businesses and religious groups, for example, began to rally for changes as sprawl was purported to harm not only the physical landscape of communities, but also the individuals within the communities (Godschalk 1992).

The transition from growth management to smart growth was also undertaken because advocates realized that new "packaging" was necessary to sell the concept. People were no longer highly motivated by the packaging of growth management. Smart growth initiatives, on the other hand, were designed to appeal to every individual in a personal way (Anderson and Tregoning 1998). For example, under the old banner of growth management, traffic congestion was a problem because it contributed to the pollution of the air. Revamped by smart growth advocates, however, traffic congestion was a problem because it caused individuals to waste time and gas money idling in heavy traffic. Improving air quality remained a primary goal, but it became cleverly disguised.

I will now establish a working definition of smart growth based on the literature review I have presented thus far in Chapter II. A smart growth program meets each of the following criteria: (1) it is focused on reducing urban sprawl and the pathologies associated with sprawl; (2) it addresses multiple issues, which may include affordable housing, resource conservation, mixed-use development, and revitalization of urban areas; (3) it is beneficial to the environment, the community, and the economy; and, finally, (4) aspects of the program are designed to improve quality of life for individuals. Based on this definition, I will now examine what smart growth laws are in effect at the state level, and how those laws are both similar to and different from one another. This information will be useful in eventually testing the effectiveness of various types of smart growth programs.

Classifying Smart Growth Legislation

For nearly thirty years, the growth management trend in this country has been for an increasing number of states to assume some level of responsibility for local land use planning. As previously mentioned, in most states at least some singular aspect of growth management is controlled by the state (protection of coastal areas, for example) (DeGrove and Metzger 1993). Classifying state smart growth legislation is important because doing so facilitates evaluation of the effectiveness of these programs. It is important for researchers to determine whether these programs are having the intended effects because theoretical support for these programs has helped them become fashionable with many planners, government officials, citizens, and academics (Burby and May 1997).

Differentiating growth management legislation in the states is also important for developing and refining theory in this field. Much of the literature regarding growth planning focuses on the use of a single growth management tool, or a single jurisdiction's experience with managing growth. While these case studies contribute to the general body of knowledge on this subject, researchers find it difficult to draw broad lessons from them (Bollens 1993, Burby and May 1997).

Inadequacy of the Existing Literature

Most classification systems identified in the literature focus on land use or growth management. Land use systems alone do not include the diversity found in smart growth programs. For example, growth boundaries may be included, but not along with transportation issues and affordable housing. The closest, or most similar studies are those that classify states by how they approach growth management. The relevant literature from this similar field will be reviewed in order to establish some existing theory.

Review of the Literature

A search of the literature reveals a variety of models for classifying state growth management legislation. In the following sections I will survey and critique seven of these classification systems. From the planning literature, I will detail the frameworks created by Gale (1992) and Bollens (1992). Following those systems I will review work by Ndubisi and Dyer (1992); Durant, Thomas, and Haynes (1993); Burby and May

(1997); Bollens and Caves (1994); and DeGrove and Stroud (1987); all of which originate in the policy analysis literature.

None of these models is fully adequate for the task of meaningfully differentiating between the systems of growth legislation so possible relationships among variables can be tested. Some of the models reviewed here are so complicated that they are difficult to reproduce independently. Others are too simplistic, and classify legislation by only one dimension. This research attempts to constructs a model of classification that remedies these shortcomings, in turn making it possible to investigate the effects of the different types.

The Gale Model

Gale (1992) developed a system for classifying state growth management programs based on the intergovernmental frameworks created by the legislation. The result is that qualifying states fit into one of four categories that primarily emphasize the level of coercion exerted by the state within the planning system.

To develop his framework, Gale examined each state's growth management legislation according to three principle criteria. The first criterion involved determining what each state required for plan submittal and review. He was interested in whether each state mandated planning for local governments, or whether such activity was optional. For this first criterion, Gale also considered how local plans were reviewed. If a state required local plans to be reviewed at the regional or state level, he determined whether the reviewing body had the authority to approve or disapprove the plans, or whether the review was solely a forum for comments and suggestions. Additionally, Gale examined how the state resolved disagreements between municipalities, counties or regional councils, and the plan review entity.

The second criterion that Gale evaluated in examining state level growth management programs was what kind of "consistency" and "compatibility" requirements were in place between the various levels of government. For example, Gale looked at whether the state required consistency between local and county, or regional plans; local and state level plans; and regional and state level land management plans. He was also interested in determining whether the plans of local governments were required by the state to be compatible and nonconflicting with those of their neighbors, or "proximate jurisdictions". Lastly, Gale was interested in "local internal consistency", or whether local governments required by the state to ensure that local zoning ordinances and local capital improvements programs be consistent with their own comprehensive plans (Gale 1992).

Gale's third and final criterion for classifying growth management legislation involved looking at the systems of incentives and/or disincentives states provided to local governments in the planning process. He determined whether each state made technical and/or financial assistance available to local or regional governments. He also looked at whether states imposed sanctions on local governments for nonparticipation or noncompliance with program requirements, such as ineligibility to apply for state grants (Gale 1992).

Based on the information he collected while examining state planning legislation in light of these three criteria, Gale developed four unique categories to describe growth management as it was being instituted by the states. These were the categories "state dominant", "regional-local cooperative", "state-local negotiated", and "fusion" (*All tables and figures have been placed in the Appendix. Please see Figure A-1 for The Gale Model*).

States grouped in the "state dominant" category included Oregon (1973), Florida (1986), Maine (1988), and Rhode Island (1988). The programs in these states imposed mandatory local or local and regional plan preparation. Each of these also gave the states the power to impose serious sanctions on planning bodies that did not submit a plan, or failed to meet the state standards. These state programs established strict standards of interjurisdictional consistency. Maine was the exception. That program did not require state or regional level plans, so consistency was treated differently in that case (Gale 1992).

The second category Gale developed was "regional-local cooperative". Two states were included in this category- Vermont (1988) and Georgia (1989). In both of these instances, state governments have an obviously less decisive role in growth management than did the governments of the state dominant category. Plan preparation is voluntary for all communities in this second type of system, and the reviewing body is limited to only making comments and suggestions. In addition, consistency standards are much less exacting for these two states. The effect, as Gale notes, is that resulting regional and state plans in Georgia and Vermont may be primarily "an amalgam of policies" by either state's local governments (Gale 1992).

Gale's third category, "state-local negotiated", was unique to only the state of New Jersey (1986). In this case, while state government has a central role in the planning process (as in the state dominant approach), plan preparation is voluntary at the regional and local levels (as in the regional-local cooperative approach). Local governments in New Jersey can negotiate with the State Planning Commission over terms and conditions of the state plan that both agree to accommodate. This is a process unique to New Jersey known as "cross-acceptance". County governments also have a role in this process, as they are supposed to act as liaisons between local governments and the state commission to facilitate negotiation. It is important to note here that because neither the regional-local cooperative or the state-local negotiated category has stringent sanctions in place for noncompliance with the state plan, states in both must rely on some other mechanism to entice local government cooperation. Gale suggests that the passage of time will reveal whether factors such as interjurisdictional peer pressure, critical media publicity, citizen and interest group mobilization, and systems of state incentives and disincentives can effectively bring about effective land use planning within these states (Gale 1992).

The fourth and final approach in Gale's system is called "fusion". Washington (1990) is the only state Gale assigned to this hybrid category. Washington, like the state dominant cases, mandates local and county plan preparation, but only for rapidly growing areas. Those areas in Washington with less substantial growth may decide not to participate. Jurisdictions that choose not to participate then become ineligible for certain types of state grants. On the other hand, the legislation in Washington also exhibits characteristics of the regional-local category in that responsibility is somewhat decentralized. The role of the state in this instance is limited solely to review and comment on county and local plans (Gale 1992).

Gale made an important contribution to the study of growth management as it is legislated by the states, because he was one of the first researchers to devise a classification system of this type. As Weitz concluded, Gale deserves at least an "honorable mention" for pioneering a template for this type of research (Weitz 1999, quoted p 275). In fact, Gale's framework is of limited use because while the resulting model appears to be intuitive, his method for arriving at such conclusions is complex and difficult to replicate. One problem is that the three broad criteria that he bases his analysis on- state requirements for plan submittal and review; consistency and compatibility requirements; and incentives/disincentives; must be translated into the four various models. This leaves a lot of discretion to the researcher attempting to translate the information.

Weitz (1999) provides an example of this methodological inconsistency by challenging Gale's description of Florida as state-dominant and Georgia as regional-local cooperative. According to Gale's classification, state-dominant programs do not allow much "discretionary judgment" by regional or local governments in comparison with the other models. Weitz argues that it is, in fact, Florida's program that contains an informal procedure allowing local governments to negotiate with the state regarding compliance with state statutes. At the same time, while Georgia's legislation does allow local governments certain variances to the minimum planning standards, in reality these are rarely granted. Weitz means to point out that based on Gale's classification system, different researchers may arrive at different conclusions.

The Bollens Model

Bollens (1992) has also developed a growth management classification system that considers the intergovernmental structures created by state legislation. A central theme underlying Bollens' work is that *when* the legislation was enacted has a lot to do with *what* roles state, regional, and local governments are given within the program. Bollens shows that state growth policies have evolved over time, from their beginnings as preemptive, regulatory, environmentally oriented interventions during the "first wave", to more cooperative, incentive based state and local planning efforts with growth accommodating economic policies. Accordingly, he develops three categories to describe state growth management legislation that correspond with the increasingly cooperative nature of the efforts (see Figure A-2) (Bollens 1992).

Bollens' first category is "preemptive/regulatory". State programs included here are characterized by direct state land-use regulatory power and a focus on protecting the environment. In these cases, when projects of a predetermined size or within environmentally sensitive areas are proposed, the state, or in some cases regional governments, can override or preempt local action. Bollens describes Vermont's Environmental Control Act of 1970 as the "purest example" of preemptive/regulatory state growth management legislation. Under the act, regional boards reviewed projects proposed by local governments that could have had regional area externalities, such as water and air pollution, traffic congestion, and soil erosion. As described above, most of the pieces of legislation Bollens classified as preemptive/regulatory were passed in the 1970s, during the "quiet revolution", or "first wave", in land use management (Bollens 1992).

The second category created by Bollens was termed "conjoint/planning". Most of the pieces of legislation categorized here are representative of the popular planning notions prevalent during the "second wave" of land use reform, and were enacted beginning in the mid-1980s. Conjoint/planning legislation is different from the preemptive/regulatory classification described above in that there is a lesser degree of coercion by the state. Rather than automatic preemption of local authority, states and regions that employ a conjoint/planning framework mandate that local governments develop and implement plans consistent with state (or regional) goals. Some penalties that may be imposed by the state (or region) for failure to comply with goals and standards include withdrawal of state discretionary funding and seizure of plan-making responsibility by the superseding level of government. The other major difference between conjoint/planning legislation and those pieces of legislation falling under the previous category is that the more recent plans of the second category have a more balanced emphasis on protecting the environment from damage, but also on promoting responsible economic development and improved quality of life for citizens. Oregon's Land Conservation and Development Act of 1973 is an example of this type of legislation (Bollens 1992).

Bollens' third and final classification, "cooperative/planning", also consists of second-wave land management legislation. While much of this legislation shares the same environmental/economic focus of conjoint/planning legislation, in this third category, local government compliance is largely voluntary. Penalties are not imposed. Rather, these cooperative strategies use incentive systems. In order to stimulate local plans consistent with state growth goals, states may offer funding, technical assistance, or increased local discretionary powers. Bollens considers Vermont's 1988 Growth Management Act to be an example of cooperative/planning legislation (Bollens 1992).

This classification system developed by Bollens is of limited use to researchers who wish to evaluate the effectiveness of smart growth legislation. The categorization of legislation based in part on when it was enacted serves primarily as a heuristic for understanding how growth management legislation has evolved during the last several decades. Newer, more progressive programs have superseded much of the legislation examined and classified by Bollens. In other words, states are not enacting preemptive/regulatory programs today. Most of the existing and newly enacted growth management legislation is classified by Bollens as cooperative/planning. Because his system does not distinguish between current programs, it is of limited use to growth management scholars. Weitz (1999) also argues that Bollens made a serious error by failing to include the role of regional planning bodies in the system.

The Ndubisi and Dyer Model

Ndubisi and Dyer (1992) have an entirely different approach to understanding growth management than do both Gale and Bollens. Ndubisi and Dyer classify state policies based on the degree of responsibility given to regional planning bodies. While these researchers admit that their work is exploratory, they argue that the greater the role of the regional entities within a state, the more effective the growth management plan will be. They support regional involvement in planning decisions because many decisions made by local governments have regional consequences. In addition, they suggest authority asserted at the regional level may ease tensions between state and local governments. Furthermore, Ndubisi and Dyer argue that, "With a regional approach, efficiency and coordination of land-use issues among local governments are enhanced, and costs and benefits are more fairly distributed" (Ndubisi and Dyer 1992, quoted p 118).

The system developed by Ndubisi and Dyer is a five-part typology describing regional authority in local growth management ranging from mandated and highly authoritative to voluntary and nonbinding. To develop a foundation for this model, the authors explain three possible categories that may describe which areas the state is most concerned with managing. First, states may have control only over certain geographic areas, such as those considered to be "critical" or unzoned. A second possibility is that state involvement may be limited to regulation of development activities only, such as developments of regional impact or benefit. Or, the third alternative is that a state may exercise control over both specific geographic areas and development activities (Ndubisi and Dyer 1992).

Ndubisi and Dyer argue that it is important to understand these differences in scope of state intervention, because each of these three types produces unique outcomes. According to the authors, state land use management that is limited to control of certain geographic areas may be ineffectual in managing growth throughout the state as a whole. For example, the state may restrict undesirable development of a protected geographic area, with the result that the development simply occurs in some other area of the state that is not regulated. The authors argue that states focused instead on managing development activity provide at least greater uniformity in regulation (Ndubisi and Dyer 1992).

The typology developed by Ndubisi and Dyer ranges from Type 1 regional participation, which is the strongest, to Type 5- the weakest (see Figure A-3). Each level of successively greater regional participation may include all of those elements exhibited in the levels below it. (Ndubisi and Dyer 1992).

Type 1 is distinguished by mandatory involvement of regional councils in state growth policy formulation. Possible duties of regional entities in states of this type include designating areas of regional significance, developing criteria and issuing permits for developments of regional impact, and reviewing local comprehensive plans for compliance with state and regional policy. The authors cite California (1972) as an example of a Type 1 regional system (Ndubisi and Dyer 1992).

Type 2 systems are the next most complex regional systems. In these cases, the state may regulate all development activity and/or all geographic areas of environmental concern. The role for regional councils in these systems is diminished, however, because they are merely enforcement agents for the state rather than participants in statewide policy making. Type 2 regional councils formulate regional land-use policy. They also may review local comprehensive plans for compliance with regional concerns. Vermont (1970) is cited as a Type 2 program.

Type 3 systems are similar to Type 2 except that only certain activities or geographic areas fall under state control. Type 3 regional systems, such as those enacted in Florida in 1985, are charged with enforcing the will of the state in those selected instances (Ndubisi and Dyer 1992).

The next level of regional council involvement, Type 4, provides much less authority to councils. In this case, regional councils do not act as enforcing bodies for state policy. Further, what regional land management policy is developed is the result of voluntary collaboration by local governments. It is interesting to note here, however, that local governments may decide to delegate certain planning responsibilities to their regional councils. If they should choose to do so, the state will provide funds for the regional council to carry out the responsibility. Duties of type 4 councils typically include providing technical assistance to local governments, collecting data and information for use by the state, and giving advice to state and local policymakers. Oregon (1973) is an example of a Type 4 regional system (Ndubisi and Dyer 1992).

Type 5 regional council systems represent the weakest category in Ndubisi and Dyer's scale. In these systems, state legislation gives regional councils no specific planning responsibilities. Local governments, however, may elect to form regional entities to address planning concerns. Unlike type 4 systems, in this case the local governments must provide the funding to support such initiatives. The state will not contribute funds. The authors conclude that these circumstances generally exist in states that do not have formal growth management plans. These systems, by default, presume that local governments are able and willing to address the problems of land and growth management. California's 1976 Coastal Act is an example of this type of regional system (Ndubisi and Dyer 1992).

The authors stress that these distinct classifications are for heuristic purposes only. In reality they suggest, most states employ a mix of these types. Therefore, because the states are not purely a single type, Ndubisi and Dyer talk about "degree of fit" between each state's system and each type (Ndubisi and Dyer 1992). Each of the examples cited in this section were rated by the authors as a "high" degree of fit for that category.

There are a couple of obvious problems with the classification system created by Ndubisi and Dyer. One problem is that the focus on regional authority is only one piece of the smart growth puzzle. These authors have neglected many other important aspects of these programs, such as the requirements established for local governments, possible penalties for noncompliance, and review standards set by the state. Regional government involvement is clearly important, but to estimate a state's success with this legislation based on this factor alone is wrongheaded. Instead, regional involvement should be included as one aspect of a more comprehensive classification system.

The second problem with the scale created by Ndubisi and Dyer is that it is fairly complicated to use. This might be improved if there were fewer categories on the scale. Instead, states must be forced into one of these five categories, and even then they can only be described according to "goodness of fit". This model does not reveal much useful information about the legislation, and what it does reveal is not clearly understood.

The Durant, Thomas, and Haynes Model

Durant, Thomas, and Haynes (1993) have also produced a classification system for understanding state growth management policy. Their typology consists of four "ideal types" that provide some understanding of the politics behind growth management legislation. These authors noticed that while urban sprawl and its related effects are found throughout the country, legislative efforts in the states vary from comprehensive, meaningful reforms, to diluted, ineffective statutes. Their research interest lay in understanding what accounts for these differences. While many variables contribute to mold a state's growth management plan, these authors focused on a political understanding.

Durant, Thomas, and Haynes developed a four-part typology based in part on the work by Ndubisi and Dyer described above (see Figure A-4). They focused on two attributes of growth management reform for classification purposes. They called these "mode" and "tempo" (based on the use of these terms in the field of evolutionary biology). Policy mode refers to the character of the reform, which can be qualitatively different from existing policy or simply a repackaging of familiar policy. In other words, mode may range from a high degree of change, for example an entirely new idea or proposal, to a low degree of change, such as a mere extension of an existing policy. The authors' definition of mode is based on the five-part scale developed by Ndubisi and Dyer, which is discussed above. Accordingly, a Type 5 system is the weakest in terms of regional authority and Type 1 is the strongest. For Durant, Thomas, and Haynes, it is the intended leap from one level to another that constitutes mode. Legislation that would produce a change from, say a Type 5 system to a Type 1 system would be a nonincremental, or drastic change. On the other hand, proposed legislation that would change a Type 2 system to a Type 1 system would be considered incremental. Within the political arena, producing a nonincremental change would be more challenging than securing an incremental change (Durant et al 1993).

The second component of these authors' typology is called policy tempo. This attribute is based on Kingdon's (1984) theory that policy alternatives must be "softened up" over a period of time before they may be successfully passed into law. I believe the term "softened up" is misleading as it is used in this instance, however. It does not mean watered down. Rather, it refers to the gestation, or incubation period of the policy proposal. Kingdon's idea was that policy entrepreneurs (those seeking to have certain legislation enacted) should keep their agenda fresh in the minds of citizens, interest groups, and government agencies, so that over a period of time, the agenda would be perceived as part of mainstream debate. Growth management reforms are placed on the tempo continuum in a similar manner to the mode continuum. A classification of low softening means that the policy moved quickly from idea conception to a prominent position on the legislative agenda. High softening refers to reform that has been considered, debated, and discussed for many years. The implication with tempo is that policy that has been highly softened will be easier to pass into law (Durant et al. 1993).

As described above, the factors mode and tempo interact to form four categories. The classifications are considered to be ideal, or theoretical, because while complex in reality, both mode and tempo ratings are restricted to only two possibilities on the scale- low or high. In addition, the authors note that a policy may change categories during legislative deliberation- if significant portions of the policy were changed, for example (Durant et al. 1993).

According to Durant, Thomas, and Haynes, quantum reform is a major change from the policy status quo that is developed and implemented quickly. In terms of the typology, quantum reform is nonincremental (high mode) and unsoftened (low tempo). Legislation of this type is usually associated with a perceived crisis in a state or a change in a state's political climate. This could be initiated by political elites in a top-down centralized effort, or it might be a powerful grassroots campaign. Intense conflict may occur in these instances. The authors note that proposed quantum reform packages are more likely to become law if they are somewhat ambiguously worded. Maryland's Growth and Chesapeake Bay Protection Act of 1991, for example, was specific in terms of implementation procedures, and it failed to become law (Durant et al. 1993).

California's Coastal Zone Conservation Act of 1972 is an example of quantum type reform. First, the policy was a tremendous shift from local to state control (Type 5 to Type 2 on the mode scale). Second, a crisis atmosphere developed in the wake of the Santa Barbara oil spill. This had the effect of urgently rushing the issue into the political arena. In addition, the policy was a grassroots initiative that culminated in referendum. Finally, conflict was considerable. Ronald Reagan, governor at the time, was unsupportive of the policy, as were many legislators. Despite the challenging conditions associated with quantum reform, concerned citizens were able to secure the legislation (Durant et al. 1993).

The emergent category includes reforms that are high policy change, or mode, and high policy softening, or tempo. According to the authors, in these cases the policy emerges well softened from a professional-bureaucratic complex within government, the Department of Natural Resources, for example. It is likely not softened outside of those government offices, however. As a result, potential supporters outside of the agency may be skeptical, defensive, and concerned about hidden benefits the policy advocates may collect if they are successful. The nonincremental, real policy change being considered must be sold to concerned citizens and legislators. If the reform is to be successful, advocates must build coalitions of support (Durant et al. 1993).

North Carolina's Coastal Area Management Act of 1974 is an example of emergent reform. It was a fairly drastic policy change (moving from a Type 4 to a Type 2 system). In addition, the softening that did occur was within the scientific community, among natural scientists who were concerned about development along the coastline. After much debate and negotiation, a modified version of the act did become legislation. In order to secure enough votes to pass the law, however, supporters finally agreed to a change to a Type 3 system, with fewer boundaries and state regulatory roles (Durant et al. 1993).

Convergent reform is the third type in the mode/tempo classification system. These initiatives have low softening and low policy change. The authors called this category convergent because these issues are suddenly spotlighted and considered by the legislature when the right circumstances converge. Because of the unpredictable policy window of opportunity, previous public debate and discussion have not occurred to soften the issue. In the rush to have the policy enacted, key legislators may not be consulted regarding the substance of the reform. Instead, proponents may try to win the support of lawmakers and citizens alike by advertising the policy as morally sound, or in the public's best interest. One last aspect of convergent reform is that in order to have the policy successfully enacted, proponents must allow adversaries to "save face". This typically results in a more ambiguously worded statute (Durant et al. 1993).

The authors cite New Jersey's experience with the State Development and Redevelopment Plan in 1986 as an example of convergent type reform. In this instance, a policy window was suddenly opened when the New Jersey Supreme Court ruled in the *Mount Laurel* decisions that the court itself would maintain control over all local zoning and planning decisions until legislators could enact a planning statute that fairly addressed the state's housing needs. Proponents of the State Development and Redevelopment Plan seized the opportunity to gather support for the comprehensive growth management policy. Opponents of the proposed legislation (primarily local governments) "saved face" by securing wide powers for themselves. The net result was a "comprehensive" planning statute that functioned more like a system of checks and balances. The cross-acceptance process ensured negotiation between state and local governments over the final plans. Moreover, the state did not have the power to force local compliance with the plans (Durant et al. 1993).

The final category of reform developed by Durant, Thomas, and Hayes is the gradualist type. According to the authors, gradualist types of growth management reforms are the most common type in the United States. As the name implies, these policies develop gradually over time. They are highly softened yet incremental changes. Bargaining within the legislature is amicable. Specialists in the relevant agencies work out details of the policy. Contributing to the attitude of cooperation is the expectation by all stakeholders that the resulting policy, low in mode, will require only minimal changes in existing budgets, staffing levels, and enforcement structures (Durant et al. 1993).

Maryland's Economic Growth, Resource Protection, and Planning Act of 1992 is an example of gradualist policy. The authors describe the legislation as "quantum-sounding growth management reforms that are really only well-softened, incremental shifts from the pre-existing regulatory regime" (quoted p. 46). In this instance, local governments in Maryland were to retain almost all land use decision-making powers. In addition, the goals devised in the policy were intentionally ambiguous- to protect environmentally sensitive areas, for example. One final example of the weakness, or extreme incremental nature of the legislation was that compliance by local governments was required only to the extent that they could afford to do so (Durant et al. 1993).

The model created by Durant, Thomas, and Haynes is of limited use to researchers who wish to evaluate the effectiveness of state initiated growth legislation because it does not yield substantive information. It does not help with distinguishing legislation so that independent variables can be established. The placement of legislation (or, attempted legislation in some cases) into categories only reveals how significant the change in the legislation was from what existed previously. Furthermore, since the authors have used Ndubisi and Dyer's regional authority scale, the information is focused on the varying role of regional bodies. While a model of this type might be useful in conjunction with other measurement devises, for these purposes it is insufficient.

The Burby and May Model

Burby and May (1997) developed a more useful state growth management legislation classification system (see Figure A-5). They focused on two aspects of state intervention. The first they called degree of "prescription". For this, the authors examined three different types of consistency requirements found in state growth management legislation. First, they determined what level of *vertical consistency* each state required. Vertical consistency refers to the extent that local plans must be consistent with state planning goals. Second, Burby and May addressed requirements for *horizontal consistency*. This refers to what degree local government plans must be coordinated with neighboring local governments. The requirements of both vertical and horizontal consistency are designed so that local governments must consider the plans of neighbors in conjunction with their own. The intent is to make local governments less parochial and more responsible in addressing externalities such as pollution and traffic congestion. Lastly, what these authors termed *local internal consistency* was examined. In states that require local internal consistency, activities of local governments must be consistent with their own comprehensive plans. *Concurrency* requirements may be an important part of a state's local internal consistency requirements. Concurrency means that capital infrastructure, such as water lines and roads, must be in place and able to support private development in order for that development to occur (Burby and May 1997).

The second aspect of Burby's and May's classification matrix evaluates state "persuasion" tactics. The authors examined to what degree each of the state programs used both coercion and/or incentives in order to secure program compliance from local governments. When using either of these tactics, the goal of state planning authorities is to lessen the costs of local government compliance with state legislation. In programs that are coercive in nature, the state will impose sanctions, such as fines, on local governments, making the cost of not complying greater than the costs of cooperating with state legislative guidelines. In areas where an incentive structure is employed, states seek to help local governments to comply with planning requirements by providing financial and technical support, which in turn lowers compliance cost for the local government (Burby and May 1997).

The primary challenge with using the matrix developed by Burby and May is that the factors described above must be translated into the ordinal categories of the system. In other words, after examining a state's vertical, horizontal, and local internal consistency requirements, the state must be classified as having a low, moderate, or high degree of prescription. Obviously, the state may vary its requirements for each kind of consistency. The result is that the findings of this model are difficult to replicate because of the discretion required in categorizing the states. The same type of translation is needed for placing states on the persuasion scale (Burby and May 1997).

The Bollens and Caves Model

Scott A. Bollens, who developed one of the intergovernmental frameworks for understanding state growth management legislation described above, published another classification system two years later, with co-author Roger W. Caves (1994). In this system, the authors group legislation based on the role of counties within the process. They classify legislation according to two major categories, the subordinated-county model and the empowered-county model (see Figure A-6).

States with subordinated-county, or "top-down" growth management plans minimize the autonomy of counties by limiting them to implementation of state goals, rather than giving them a participatory function in the design of those goals. In these systems, counties and cities prepare local comprehensive plans that must be consistent with state goals. According to Bollens and Caves, Oregon (1973) and Florida (1985) are two prime examples of this type of system. In both cases local governments may face penalties if their individual plans are not consistent with state goals. As an additional note, the authors describe the similar backgrounds of these two states. The states both faced tremendous growth pressures, which included threats to environmental and agricultural resources. And in both cases it was determined that local governments were either unwilling or unable to protect the natural systems without interference by the state (Bollens and Caves 1994).

Bollens' and Caves' alternative category is the empowered-county, or "bottom-up" model. Empowered counties are key participants in multijurisdictional growth management strategies. They are regional leaders in designing and implementing growth management strategies. In these instances, a state mandate is not responsible for the planning responsibilities taken on by counties. Rather, the county may have acquired the leadership position through state enabling legislation, or through grassroots citizen activism expressed at the ballot box (Bollens and Caves 1994).

The authors cite New Jersey as an example of county empowerment through enabling legislation. In New Jersey, the counties function as important intermediaries between the state planning goals and the municipal growth goals. In a unique "cross-acceptance" process (described above in the Gale Model), both the state and local governments make revisions to their plans until consistency is achieved. The counties hold public meetings and document the negotiations between the state and local governments. The state then uses the reports compiled by the counties to revise state planning goals (Bollens and Caves 1994).

Barnstable County, (or, Cape Cod) Massachusetts, on the other hand, is an example of a county that has gained importance in the growth management process through citizen initiative. The county has become a unique regional land use regulatory and planning commission for the county's fifteen towns. The authors conducted a case study on the planning reforms in Cape Cod. They concluded that a combination of "bottom-up" cooperation and "top-down" encouragement from the state would perhaps be the most effective arrangement. Based on their research, the authors suggest that state governments should set regional growth goals in order to stimulate inter-local governmental cooperation. After that, however, the governments and citizens of each region should be able to develop plans and a governance structure based on local needs. In short, these authors recommend a subordinated-county/empowered-county hybrid arrangement for effectiveness (Bollens and Caves 1994).

While the model provided by Bollens and Caves is easier to use than the model by Ndubisi and Dyer, they both have the same fault- concentration on one aspect of growth management to the exclusion of others. Regional authority, or in this case county authority, probably is an important part of successful growth management in conjunction with other factors rather than by itself. Unlike the system of Ndubisi and Dyer, however, Bollens' and Caves' model may be too simplistic, since it separates states into only two categories. Indeed, there is enough variation among the states that a useful classification model would certainly have more than two categories.

The DeGrove and Stroud Model

John M. DeGrove and Nancy E. Stroud (1987) developed a four-part classification system for state growth management programs (see Figure A-7). Their model classifies state growth management legislation according to the *scope* of the program created. Their first category is called "comprehensive/selective". States with a comprehensive/selective approach may apply their program throughout the state, but they are restricted to particular types of development or geographic areas. In Florida, for example, the Land and Water Management Act of 1972 established a critical-area program so that a particular geographic area of concern could be selected for special management attention from the state. According to the act, the governor and Cabinet may review the local land use plans of such critical areas, and if they are unsatisfactory, the governor and Cabinet may supercede local authority and impose state plans and regulations on the area (DeGrove and Stroud 1987).

The second variety of state land regulation developed by these authors is called "comprehensive/general". These programs are described as statewide in scope and applicable to all land use activities. Hawaii's 1961 land use legislation provides an example of comprehensive/general state regulation. The Hawaiian Land Use Commission divides the entire state into one of four land use districts, thereby determining what type of development may occur in all locations. The Commission may also approve changes in the boundaries and issue special permits or zoning variances in all but "conservation" districts (DeGrove and Stroud 1987).

DeGrove's and Stroud's remaining categories pertain to states that have special geographic areas to plan and regulate. The third category is the "coastal" approach. Coastal planning is given its own category by these authors because it is so highly developed. The 1974 North Carolina Coastal Area Management Act is one example. According to this legislation, each coastal county in the state is required to adopt a coastal plan. While local governments monitor minor development in areas of environmental concern along the shoreline, "major" developments in these areas may only proceed after a state permit is acquired (DeGrove and Stroud 1987).

The final category of land use planning developed by DeGrove and Stroud is termed the "selective" approach. It includes all areas of special concern, except coastal areas, which have their own category above. The New Jersey Pinelands are an example of the selective planning approach. The Pinelands Commission has the responsibility of developing a comprehensive plan for the area. The Commission then insures that county and municipal plans within the area conform to the special criteria developed (DeGrove and Stroud 1987).

The model developed by DeGrove and Stroud is intuitively appealing. It is also amenable to replication by other researchers because of the straightforward instructions provided by DeGrove and Stroud. However, it is too simplistic to employ as the only means for a growth management legislation evaluation measure. As with several of the other models detailed, this one may be useful if used in conjunction with another model.

Another criticism of the DeGrove and Stroud model is that the areas of special concern category no longer needs to be divided so that coastal areas are in an exclusive category apart from other areas of special concern, such as wetlands. In the mid 1980s, when DeGrove and Stroud were researching their model, coastal land management legislation was more highly developed than legislation regarding other areas. The differences are no longer great enough to warrant this separation however (Weitz 1999).

The Proposed Model

I will develop a revised growth management classification model by combining selected attributes of the DeGrove and Stroud (1987) model with those of the Gale (1992) model. The result is shown in Figure A-8. The new model classifies state growth legislation on two dimensions: scope of coverage and level of coercive power exerted by the state. In order to place a piece of legislation within one of the nine newly resulting categories, it must first be determined whether the legislation is comprehensive, or statewide, in scope, or whether it pertains only to an area of special concern, as DeGrove and Stroud established. The law may be placed into one of three categories- comprehensive general, comprehensive selective, or areas of special concern. (These terms, borrowed from DeGrove and Stroud, are explained in detail in the previous section and matched with exemplary laws.)

Legislation that is comprehensive-general in nature is applicable to all land use activities throughout the state. Comprehensive-selective legislation is also statewide in application; however, it is restricted to particular types of development or to certain geographic areas. At this point a difference should be noted between the DeGrove and Stroud model and the proposed model. DeGrove and Stroud presented four possible categories, whereas the newly proposed classification system has three categories. This difference is accounted for by the fact that those authors separated legislation applying to areas of special concern into two subcategories- coastal areas, and all other special areas. In the newly proposed model, these classifications have been collapsed so that coastal areas and all other special areas (such as Pinelands) are considered together, in the final category called special areas only.

Once a piece of legislation has been labeled as comprehensive-general, comprehensive-selective, or restricted to areas of special concern, the level of coercive power reserved for the respective state government must be determined. While categorizing state legislation by scope, as described above, is straightforward, placing states within the model based on the coercion component is more difficult. To describe the continuum of degree of coercion by the state, an ordinal scale consisting of three categories is used. The categories are labeled low, medium, and high coercion. Even within a single category such as "high coercion", however, variation may exist between state programs.

States utilizing a high degree of coercion generally have mandatory planning programs. The level of jurisdiction that is mandated to plan may vary by state. For example, regional and local planning may be mandated, or, city and county governments may be mandated to plan. In states with highly coercive programs, penalties for noncompliance are stringent. These may include ineligibility to qualify for state sponsored grants and loan programs, or, in some cases the state may intercede and plan for a noncompliant jurisdiction.

At the other extreme of the coercion scale lays state programs that have low levels of coercion. Within this category, compliance with state programs is voluntary, at least in part. States that do not mandate planning, for example, attempt to gain compliance by offering incentives to regional or local governments, or to both. Incentives may include grants for local projects or free technical assistance with developing plans. At the same time, the state may also use sanctions against local governments who do not voluntarily participate.

In between the two extremes of high coercion and low coercion is the middle category. It is challenging to draw generalizations about these types of programs. They may employ a mix of incentives and disincentives. Policies may be mandatory, but perhaps only for jurisdictions of a certain population, or a certain location. There could also be an unusual amount of cooperation, or a partnership of sorts, between state and local governments with medium-coercion programs.

The addition of this second attribute, level of state coercion, results in nine final possible categories, as shown in Figure A-8. These are low, medium, and high coercion comprehensive-general; low, medium, and high coercion comprehensive-selective; and low, medium, and high coercion areas of special concern. The interest of this project is with the categories represented by the three boxes in the top row of the diagram- low coercion/comprehensive-general, medium coercion/comprehensive-general, and high coercion/comprehensive-general. State smart growth programs are classified within these three categories. Based on the definition of smart growth I proposed earlier in Chapter II, I will restrict the study to these three categories because I am interested in the highly comprehensive nature of those laws. As I wrote in the definition, smart growth programs must address multiple issues related to urban sprawl, and must provide benefits to the community, economy, and environment.

Improvements over Existing Models

The proposed model is an improvement over existing models for several reasons. First, it incorporates more than merely a single piece of information, as many of the existing models rely on. Bollens and Caves (1994), for example, sought to understand growth management legislation in light of the amount of authority granted to counties. While a single explanatory variable may yield some useful information, this approach clearly leaves much unexplained. In this improved proposed model, the scope of legislation and the coercive power of the legislation are both included.

A second benefit to using this model is that researchers may replicate the work of others who may use it. Many of the existing systems are complicated and require the researcher to exercise a level of discretion that may lead different individuals to different conclusions.

Another improvement of the proposed model is incorporated into the coercion category. In some previously published models, researchers considered the degree of possible sanctions used by state governments as a separate measure from possible incentives used by states to encourage local action that was not mandatory. While this differentiation may have been appropriate to employ when examining legislation employed during the quiet revolution, or "first wave" of land use reform, such a differentiation is not necessary today. As described previously, first wave legislation focused primarily on protecting the environment, and it was largely imposed upon local governments as a mandatory program (DeGrove 1990). Recent legislation employs a cooperative framework, however. Often there is negotiation between levels of government. In addition, legislation no longer fits neatly into the designation of sanctions only or incentives only (Bolen et al. 2001, Johnson 2002). Instead, in almost all cases, both are used. Typically, local governments may be punished or disadvantaged in some manner by the state for failure to comply with the law. At the same time, however, most states employ systems of incentives to help lower the costs of compliance for local governments. In the proposed model, the coercion measure encompasses both sanctions and incentives at the same time.

Using the Proposed Model to Select States for Study

Classification of state smart growth efforts is important to an evaluation of the effectiveness of such legislation. In other words, the *type* of smart growth program in place is important because different types might produce difference degrees of effectiveness. Previous research (Burby and May 1998) has suggested that mandatory planning laws produce not only higher degrees of compliance from local governments, but also higher quality plans. Based on these findings, I might expect more coercive smart growth programs to be more effective.

Because the existing models for classifying growth legislation are inadequate for determining effectiveness, a proposed model has been developed and detailed above. Based on the new classification system, three states will be chosen for examination, each representative of a different type of smart growth program- low coercion/comprehensive-general (Maryland), medium coercion/comprehensive-general (Georgia), and high coercion/comprehensive-general (Florida). Although I will present further details in Chapters III and IV, I will state at this point that I selected these states in particular in order to provide some degree of control for geographic region and political culture.

The smart growth program in Maryland is representative of the low coercion/ comprehensive-general category for a number of reasons. First, almost all of the initiatives are incentive based ("Smart Growth" 2003). Local governments do not necessarily have to participate in the Rural Legacy program, or the Brownfields Revitalization program, for example, but the state does make financial and other types of incentives available to those local governments that do participate. Secondly, there is little in the legislation to stop local governments from engaging in poor planning practices that contribute to sprawl (Cohen 2002). The incentive structure in place essentially requires that if local governments want to develop greenspaces rather than revitalize inner cities, they may legally do so, but the state will not contribute to the cost of new infrastructure. A third reason Maryland is in this category is because while legislation from 1992 requires local governments to plan, there is no formal approval process for those plans. In short, a local government can develop and implement a plan contrary to smart growth goals because it is not dependent on regional or state approval (Bierbaum 2001, Knaap "Talking" 2002).

Georgia's smart growth program is representative of the medium coercion/ comprehensive-general category established by the proposed model. Local governments in Georgia are not mandated to plan, but if they do not, the plans of the next highest jurisdiction are imposed on them (Bolen et al. 2001). For example, if a city created no land use plan, it would be required to follow the plan developed at the county level. Regional governments, on the other hand are required to plan. In addition, all plans developed, even those by local governments, must be approved by the state. Jurisdictions whose plans do not meet the minimum review criteria for a broad range of issues (regarding land use, use and protection of natural resources, and affordable housing, for example) are disqualified from receiving state funds and other incentives. Another reason for classifying Georgia as medium coercion/comprehensive-general is that both the state and local governments are powerful in different manners (Cobb 1999). One of the greatest powers of the state is in establishing a plethora of minimum requirements concerning every aspect of smart growth, which all plans must meet, in order to be approved. Local governments are powerful at the same time, however, because of the "bottom-up" structure of planning in Georgia, as I will discuss in Chapter III (Johnson 2002). According to the legislative process, local governments prepare their plans first, then regional bodies, and lastly the state, with both of the latter basing their plans on local plans (Weitz 1999).

Lastly, Florida's smart growth program is high coercion/comprehensive-general in nature. The state plan is the guiding document for the program, establishing policy for 26 areas of growth management. Local governments are mandated to prepare plans that must address each of the 26 areas outlined by the state (Bolen et al. 2001). Furthermore, those plans must be approved by the state. Regional level plans are also required. The State of Florida also mandates both "consistency" and "concurrency". Consistency requires that plans from local governments be in accord with the plans of not only the region and the state, but also of neighboring governments. Concurrency requires that infrastructure and basic services both be in place before development may occur in an area (Catlin 1997, DeGrove 1990).

In the following chapter, the smart growth programs of these three states will be examined so that the differences between them can be more fully illuminated. This, in turn, will allow for a basic evaluation of the effectiveness of these programs in Chapters IV and V, ultimately allowing for a tentative conclusion as to which category of smart growth legislation is most effective.

CHAPTER III

SMART GROWTH PROGRAMS IN MARYLAND, GEORGIA, AND FLORIDA

Introduction

In this chapter, I will discuss state smart growth legislation in Maryland, representative of the low-coercion/comprehensive approach; Georgia, representative of the medium-coercion/comprehensive approach; and Florida, representative of the high-coercion/comprehensive approach. For each of these states, I will detail the history and impetus behind the legislation, the gradual development of the legislation, and, finally, implementation of the legislation. Following examination of the state programs, I will discuss the logical connection between state smart growth legislation and smart growth initiatives adopted by local governments, cities in particular. I will then select one city from each state for analysis in Chapter IV.

Maryland

Smart growth in Maryland is often described as innovative because of the unique incentive structure at the heart of the programs (Freilich 1999). Richard Moe called it "the most important set of new ideas for growth management... in the last twenty years" (Beaumont 1999, quoted p. 64). In this section I will detail the history and structure of Maryland's program.

Impetus For Smart Growth: Response to an Environmental Crisis

As has often been the case in other states, the story of land use management in Maryland was predicated by a widespread perceived environmental crisis. In 1983, the Environmental Protection Agency released the results of a study of the Chesapeake Bay, one of Maryland's most beloved natural resources. Findings from the report indicated the deterioration of the bay, prompting both state and federal initiatives aimed at reducing the amount of pollutants causing the damage (Cohen 2002, Freilich 1999, Knaap "An Inquiry" 2002).

Five years later, a panel of experts called The 2020 Commission released another significant report. These experts had been charged with advising what measures were necessary to protect the bay, while still allowing for the projected population growth in the area through the year 2020. In their final report, commissioners detailed the alarming trend of sprawl in the bay region, as well as the overall lack of growth management planning at both the state and regional level (Bolen et al. 2001). The report recommended that policy makers be guided by six "visions" for stewardship and growth accommodation of the bay region (Cohen 2002, Knaap "An Inquiry" 2002). These "visions" would later become some of the core elements of the state's smart growth initiative. These were:

1. Concentrate development in suitable areas
2. Protect sensitive areas
3. In rural areas, direct growth to existing population centers and protect natural resource areas
4. Make stewardship of the land and the Chesapeake Bay a universal ethic
5. Conserve and reduce the use of resources
6. Institute funding mechanisms to achieve these visions (Cohen 2002, Knaap "An Inquiry" 2002)

The release of The 2020 Commission's report in 1988 spurred an unsuccessful attempt at a statewide smart growth law (Weitz 1999). Supporters of the failed 1990 bill sought to significantly increase the state's regulation and oversight of local land use planning. The law would have required local governments to classify land into four categories based on useage. While the bill was popular with environmentalists, it failed to gain necessary votes in the legislature for two primary reasons, according to Cohen (2002). These were that too much power would have been usurped from local governments by the state, and that the bill failed to recognize the state's regional and geographic diversity (Cohen 2002).

Development and Character of Smart Growth Legislation

In 1992, Maryland lawmakers succeeded in enacting legislation that became the foundation for the state's smart growth program. The Economic Growth, Resource Protection, and Planning Act of 1992 is known as a "comprehensive planning act" because it mandates that all cities and counties develop comprehensive land use plans (Bierbaum 2001, Freilich 1999). Further, those plans were required to address seven visions identified by the state, and to include certain elements, such as transportation, community facilities, mineral resources, and sensitive areas (Bolens et al. 2001, Knaap "An Inquiry" 2002). For example, plans were required to incorporate four sensitive areas elements. These included steep slopes, streams and buffers, 100-year floodplains, and habitats of endangered species. This portion of the legislation was intended to ensure that each city and county preserve and protect these types of fragile areas. Policy analysts quickly concluded that would not likely be the outcome because the legislation allowed each jurisdiction to define the "elements" and determine the suitable level of protection for each (Cohen 2002, Knaap "An Inquiry" 2002).

The 1992 planning act became law because competing interests were satisfied during political maneuverings within the state assembly. In addition to being vaguely worded, the final product assigned only a small role to the state, and allowed local governments great discretion in designing their plans (Freilich 1999). The state's Department of Planning was charged with reviewing local plans and providing advice, but the local governments were never required to follow those recommendations in their final plan (Bolen et al. 2001). The state of Maryland also tried to assist cities and counties with planning requirements by providing publications and other useful materials. While political negotiation and compromise did succeed in enactment of the law, little time passed before shortcomings of the law were revealed (Cohen 2002, Knaap "An Inquiry" 2002).

Contributions of Governor Glendening

When Governor Glendening took office in 1995, he made growth management for Maryland one of his administration's top priorities (Bierbaum 2001, "Smart Growth" 2003). Not only was Glendening concerned about the future livability of the state, but he was also a skilled politician who researched what measures were necessary to convince Marylanders that his vision of smart growth for the state was sound (Schneider "The New" 2001). Governor Glendening spent his first two years in office collecting information regarding how citizens felt about their state and the legislation that was currently in place. He held over 400 public meetings throughout the state. He also worked closely with both state and local level agencies as his legislative agenda began to take shape (Bierbaum 2001).

In 1997, Governor Glendening's efforts finally were realized in the form of the Smart Growth Areas Act ("Smart Growth" 2003). He had been able to learn from the unsuccessful policy initiatives of preceding years in order to craft a program and an implementation style that would be accepted by the legislature, citizens, and other stakeholders (Bierbaum 2001). Glendening reasoned that in order for his smart growth plan to be embraced, that it would have to meet certain criteria. First, the program needed to be incentive based rather than based in regulation. That way the programs would not intrude on local land use authority- a particularly important point since previous legislative efforts had failed largely because of ignorance of its importance. Second, his plans had to be designed so they could be implemented immediately and without the creation of any new bureaucracy. Lastly, the Governor insisted on reprioritizing existing government budgets rather than requiring new spending (Beaumont 1999, Bolen et al. 2001, Cohen 2002).

Glendening also took a unique approach in order to "sell" his plans to the public by making a link between economics and social policy goals (Bierbaum 2001). He focused his message on government efficiency, a topic that he believed citizens and lawmakers would find it hard to argue against. With efficiency as the emphasis, the Governor announced three major objectives for his smart growth program. These were to save natural resources, to support existing communities and neighborhoods by supporting areas where infrastructure was already in place, and to save money by not building new infrastructure (Cohen 2002, Knaap "An Inquiry" 2002).

The 1997 Smart Growth Areas Act

The smart growth program instituted by Glendening in Maryland consists of five primary initiatives (Bierbaum 2001, Cohen 2002, Knaap "An Inquiry" 2002, "Smart Growth" 2003). The centerpiece of these is the 1997 Smart Growth Areas Act. These initiatives, together with Maryland's 1992 legislation, make-up the state's smart growth program. This program discourages low-density development by directing state spending on infrastructure and public services into existing communities and areas that are targeted for growth. The areas that are eligible for state funds are called priority funding areas, or PFAs. PFAs include the traditional urban areas of Maryland- the City of Baltimore and areas inside the Baltimore and Washington beltways. They also include neighborhoods that have been designated by the state's Department of Housing and Community Development for revitalization, such as Enterprise Zones and Heritage areas (Knaap 2002). Counties may designate additional PFAs that meet certain criteria established by the state. In order to qualify, proposed PFAs must:

1. Have a permitted density of at least 3.5 units per acre
2. Have existing or planned water and sewer systems
3. Be consistent with county growth projections and a long term policy promoting orderly expansion of development and efficient use of land and public services (Knaap "An Inquiry" 2002, "Smart Growth" 2003)

Despite these restrictions, an exemption process does exist that allows the state to provide funds for public services or infrastructure outside of PFAs under certain circumstances (Johnson 2002). Decisions regarding exemptions are made by the State Board of Public Works- a three-person committee including the Governor, State Comptroller, and the Treasurer. Other exceptions to the policy that do not require review by the board include commercial or industrial development that must be located away from other development, such as a railroad facility or a major highway interchange. (Cohen 2002)

It is important to note here that the law *does not prohibit* development outside of priority funding areas; rather, it simply restricts the state from subsidizing such development. Growth outside of PFAs may still occur if infrastructure costs are absorbed by either local governments or private sources. Another strategy that the state employs to prevent such growth is in offering expertise to citizen groups or communities that are opposed to development outside PFAs. For example, the state cannot prohibit a Wal-Mart from opening in a rural area, but it can make the process complicated for the retailer and its supporters by providing planning, design, and legal advice to those groups who oppose it (Bolen et al. 2001, Johnson 2002).

Potential Problems with Priority Funding Areas

The effectiveness of priority funding areas on producing desired growth patterns is largely undetermined due to the newness of the program as well as its uniqueness to the state of Maryland. Knaap ("An Inquiry" 2002) has made predictions about PFAs based on other states' experiences with the use of urban growth boundaries, which have some similarities.

One foreseeable problem is the potential political struggle that may erupt between local and state governments. According to program guidelines, the state must approve PFA designations produced by local governments. Knaap's prediction for conflict is based on the simple observation that the larger the area of a PFA, the greater the amount of state funding a local government has access to. From a purely financial standpoint, local governments might want larger PFAs while the state might want smaller ones. Further, the procedure for expanding the boundaries of a PFA after it has already been approved by the state has yet to be determined. Knaap argues that whatever process is eventually adopted will be a convoluted set of rules and regulations that is more representative of political compromise than the logic of land use planning (Knaap "An Inquiry" 2002).

A second prediction Knaap made regarding PFAs is that local governments will intentionally allow growth to occur outside of those designated areas in a process referred to as "income and substitution effect". According to Knaap, cities and counties might reallocate money that they otherwise would have used to finance urban services inside the designated growth areas to finance infrastructure and service demands outside the PFA. This action would maximize the potential dollars a local government has available to it for subsidizing growth, while negating the "smart" intent inherent in the policy (Knaap "An Inquiry" 2002).

Another dire prediction by Knaap is that sprawl will continue to occur, and perhaps be encouraged to occur, inside PFAs. Again, the state government eagerly providing money for infrastructure and public services inside PFAs may result in wasteful land use practices. Knaap suggests that local governments must ensure strong anti-sprawl regulation within the boundaries in order to prevent or minimize this outcome (Knaap "An Inquiry" 2002).

The fourth observation Knaap made is that priority funding areas may cause controversy to develop over the effect they have on land and housing prices. As is the case with urban growth boundaries, some individuals may argue that because PFAs restrict urban land supply, the cost of housing may increase. This controversy may be compounded by the fact that Maryland does not require local governments to include an affordable housing element in their comprehensive plans. Rather, the state recommends that they do so (Knaap "An Inquiry" 2002).

While smart growth legislation in the State of Maryland may be too newly implemented to support or disprove Knaap's predictions, examining those predictions as I have done here enhances understanding of the intricacies of the laws. I will now review the remainder of Maryland's smart growth legislative program.

The 1997 Rural Legacy Act

A second major component of Maryland's smart growth program is the 1997 Rural Legacy Act ("Smart Growth" 2003). This initiative provides funds to local governments and land trusts to buy forests, open space land, and farms in designated "rural legacy" areas, so that the land may remain undeveloped. Policymakers attempted to accomplish numerous goals through preservation of these areas. Goals included preserving wildlife habitat; reducing pollution runoff into streams and the Chesapeake Bay; protecting farming, forestry, outdoor recreation, and tourism from the effects of sprawl; and preserving a "sense of place" in the countryside (Cohen 2002, Knaap "An Inquiry" 2002, "Smart Growth" 2003).

Participants in the Rural Legacy program are selected through a competitive process. Special criteria are used in the state's review in order to compare the significance of each property in terms of agriculture, forestry, and natural resources. These criteria include the degree to which the purchase will protect contiguous blocks of land; the degree to which the resources and character of an area are threatened by development; and the significance of any historic sites on the property. Local governments and land trusts chosen to receive grants must sign a contract with the Rural Legacy Board that outlines recommendations for furthering rural land conservation. Program participants are also required to submit annual reports to the board detailing their efforts and any improvements to their land preservation program (Bolen et al. 2001, Cohen 2002, Knaap "An Inquiry" 2002).

An amendment to the act in 2000 allows development rights that have been purchased from landowners in these areas to be resold to developers, a legal procedure known as "transfer of development rights", or TDR. Developers, however, may only use the rights in priority funding areas. In addition, the local government that sold the rights is required to use fifty percent of the profit on capital projects. The other half of the proceeds must be given to the Rural Legacy Program, where the amendment mandates that the funds will be used for conservation in the county where the TDR occurred (Cohen 2002).

The Brownfields Voluntary Cleanup and Revitalization Incentives Program

The Brownfields Voluntary Cleanup and Revitalization Incentives Program is a third smart growth program that is intended to stimulate reuse of contaminated property (Cohen 2002, Knaap "An Inquiry" 2002, "Smart Growth" 2003). As defined in a previous chapter, brownfields are abandoned properties in cities or inner ring suburbs that continue to remain unused because of contamination due to some previous industrial use (Anderson and Tregoning 1998). Communities benefit in several ways from the rehabilitation of these properties. In addition to the obvious public health benefit of decontaminating an area, local governments save money when these sites are restored because they usually have infrastructure such as water and sewer systems already in place. The use of existing infrastructure saves taxpayer dollars that would otherwise be spent on the construction of new roads, utilities, etc. In addition, urban sprawl may be avoided and valuable green space may be saved when industrial sites are rehabilitated. Finally, reuse of these properties contributes to the revitalization of cities by helping to bring commerce back to an abandoned area (Anderson and Tregoning 1998, Briechle 1999, Silberstein and Maser 2000).

The greatest obstacle to rehabilitating brownfields that has had to be overcome in Maryland is the issue of who is ultimately liable for environmental, public health, or other damages caused by contaminated property (Cohen 2002). In 1980, federal legislation (The Comprehensive Environmental Response Liability and Compensation Act, or CERCLA) was created establishing the "Superfund" program, which sought to identify and target the most severely polluted brownfields in the country. This legislation placed responsibility for cleanup expenses on current owners of such properties whether they were involved in originally discharging the pollutants or not. The effect of the policy was to discourage businesses from purchasing sites that were contaminated, or possibly contaminated (Cohen 2002, Knaap "An Inquiry" 2002).

The brownfields revitalization program in place in Maryland is a two-pronged approach to alleviating those concerns of potential participants described above. First, the Voluntary Cleanup program eliminates, or at least reduces, liability concerns of new resident businesses. Qualifying participants submit a proposed cleanup plan to the

Maryland Department of the Environment, which administers the program. After approved cleanup plans are executed to the satisfaction of the state, the new tenants are legally released from further liability (Bolen et al. 2001, Cohen 2002).

The second part of the state's effort is the Brownfield Revitalization Incentive Program, which offers financial incentives in the form of grants or low interest loans to commercial enterprises willing to participate (Cohen 2002, Knaap "An Inquiry" 2002, "Smart Growth" 2003). The available funds can be used in the environmental assessment and plan development phase, or for the property cleanup itself. In addition, this program allows property tax abatements for site owners who have completed their cleanup programs, provided the property is located in a participating taxing jurisdiction. Property tax credits equal to fifty percent of the property tax attributable to the increase in value of the site since the last pre-cleanup assessment are available for five years after the site rehabilitation is complete (Bolen et al. 2001, Cohen 2002).

The Job Creation Tax Credit Program

The fourth major part of Glendening's 1997 Smart Growth initiative was the Job Creation Tax Credit Program, which was originally passed in 1996, then significantly altered in 1997 so that a greater number of businesses could qualify. The program is intended to encourage businesses to expand within Maryland or to relocate to Maryland. The changes made to the law in 1997 also encourage midsize and smaller businesses to invest in priority funding areas (Cohen 2002, Knaap "An Inquiry" 2002, "Smart Growth" 2003).

Qualified employers may receive a basic credit of $1,500 per employee. Only specified industries are eligible for the tax credit. These industries include manufacturing, biotechnology, computer programming, transportation, and communications. Some exceptions are allowed, but with more stringent conditions that must be satisfied. For example, entertainment, recreation, and tourism types of businesses are eligible for the tax credits only if they will generate a minimum of 1000 new full time jobs in a two-year period (Cohen 2002, Knaap "An Inquiry" 2002).

To qualify for this tax credit, a business must create a minimum of twenty-five new, full-time jobs, with a salary 1.5 times the federal minimum wage, and located within a priority funding area. Each position must be newly created, and not a transferred job from another part of the state. Each job must also provide at least thirty-five hours a week of work to an individual employee. Further, each position must remain in existence for three years after the credit is claimed, otherwise the state may reclaim it (Cohen 2002, Knaap "An Inquiry" 2002).

It should be noted that while in order for a company to qualify for this program jobs must be created, but the law includes no residency requirements. Qualified employees may not necessarily live in the PFA that the industry is located in. In other words, the firm's location may not necessarily correlate with increased job opportunities for residents of those same areas (Cohen 2002, Knaap "An Inquiry" 2002).

The Live Near Your Work Program

The fifth major part of the 1997 smart growth initiative in Maryland was the Live Near Your Work (LNYW) program. This program provides financial incentives for employees to buy homes near their workplaces. One objective for LNYW was urban revitalization, which was expected to result from an increased number of homeowners downtown, as well as the increased commerce associated with those occupants. So called social benefits were also goals of the program. According to proponents, reduced commuting times and decreased automobile traffic were factors that might both improve the quality of life for employees in urban areas. A third objective was environmental. Decreased commute distances for participants was expected to lessen pollutants from car emissions (Cohen 2002, Knaap "An Inquiry" 2002, "Smart Growth" 2003).

Employees who qualify for the Live Near Your Work program can receive a minimum of $2,000 toward down payment and closing cost on the purchase of a home. There is no income restriction for employee eligibility (Bolen et al. 2001). In other words, both wealthy employees and low-income employees may apply. Program homes are located in mixed-use neighborhoods that local governments have designated as in need of revitalization. Participating employers determine eligibility requirements; including the maximum distance homes may be located from the employment location. Both the employing business and the local government contribute $1,000 to approved homebuyers. The homebuyer must also contribute $1,000. The Maryland Department of Housing and Community Development provides technical assistance and grant money to local governments participating in the program (Cohen 2002, Knaap "An Inquiry" 2002).

Cohen's Conditions for Success

According to Cohen (2002), who has researched smart growth programs in Maryland, the future success of these programs is dependent on at least four factors.

First, the state and local governments must continue to provide adequate funding for the infrastructure and public services required for growth within priority funding areas. If they fail to do so he argues, more residential development could occur outside PFAs because private developers are willing to subsidize infrastructure costs in those areas. Another potential outcome is that local governments might use "fiscal zoning" to compensate for the lack of government funding. Fiscal zoning is usually counter to smart growth because it reduces affordable housing options. Regulations of this type allow only structures that are taxed at a high rate, such as large homes, to be constructed in an area in order to produce sufficient funds for services and infrastructure (Cohen 2002).

Second, the smart growth programs must provide sufficient financial incentives to induce citizens and business people to make personal decisions that are consistent with the goals of the programs. Cohen states that because the programs are incentive based rather than mandatory, many individuals may not be aware of the opportunities available to them. Hence, the state and local governments must publicize the various programs to ensure an informed citizenry. Furthermore, Cohen predicts that additional incentives may be required in order for some programs to be successful. For example, he argues that middle-class families and those with children may need greater incentives to relocate to cities or inner-ring suburbs. "Unless great improvements are made in school quality and public safety…only certain types of individuals and households will be attracted to the city (e.g. single young adults, empty-nesters)" (Cohen 2002, quoted p. 20).

Third, support for smart growth initiatives must be maintained within the state and local governments, as well as with the public if the programs are to be successful. Support from the governor and other high-ranking state officials is critical for smart growth in Maryland. As described above in the section "The 1997 Smart Growth Areas Act", the governor, state comptroller, and treasurer comprise the State Board of Public Works, which can give approval to state funding for development outside of PFAs, in effect negating the policy (Cohen 2002).

In addition to the need for state and local government support, Cohen (2002) also argues that if citizens lose confidence in or become disenchanted with the programs, they might pressure local governments to enact regulations that undermine the state's smart growth efforts. Local government officials are likely to comply because they are interested in satisfying constituents and being reelected (Cohen 2002).

Finally, Cohen (2002) argues that benchmarks and other indicators of success must be created and utilized so that citizens, business professionals, state employees, and local governments themselves can monitor effects of the programs. According to Cohen, it is important to the long-term success of smart growth initiatives that stakeholders "see" the policies producing desired results. He cautions, however, that while benchmarking is an important factor, it will be a number of years before meaningful comparisons can be made utilizing such measures due to the relative newness of the programs (Cohen 2002).

As with Knaap's cautionary predictions regarding Maryland's priority funding areas, Cohen's observations and predictions are useful in providing a richer understanding of the legislation, even if it is premature to judge their accuracy or validity. I will now provide background information for the smart growth program implemented in Georgia.

Georgia

Smart growth legislation in Georgia is entirely unique. Local governments are merely "encouraged" to plan. The state plan is later created from local plans (Georgia 2000, Starnes 1991). In this section I will detail how Georgia's program may be classified as medium coercion/comprehensive-general.

Impetus for Smart Growth: Environmental Problems, Interjurisdictional Conflicts

In Georgia, there was no single environmental crisis that provoked smart growth legislation as there was in Maryland with the Chesapeake Bay crisis. Georgia, rather, had a number of problems throughout the state that were primarily of two types- environmental issues and interjurisdictional conflicts (DeGrove and Miness 1992, Starnes 1993). One of the most serious environmental concerns was regarding the state's water supply. A mismatch existed between supply and demand. In north central Georgia, including Atlanta, where the population was growing, water was in short supply. In the coastal plains of the state, however, where population growth was much slower, both groundwater and surface water supplies were abundant. Georgia was also experiencing the usual problems associated with sprawl, most dramatically in and around Atlanta. In the 1980s Atlanta's population boom overwhelmed the area's existing infrastructure. Traffic congestion and sewer moratoria were two results (DeGrove and Miness 1992, Starnes 1993).

Interjurisdictional conflict was another reality in Georgia. Every city and county in the state had the authority to provide basic public services and to regulate land use through planning and zoning powers. Local governments typically carried out these duties in isolation, without consulting neighboring communities. According to DeGrove and Miness (1992), uncoordinated transportation planning between jurisdictions resulted in major highways changing from two to four lanes, and then back again, as they crossed jurisdictional boundaries. The poor communication between local governments became a greater concern when the federal government issued new mandates regarding clean air, clean water, and wetlands protection. Government officials at both the state and local level acknowledged that greater cooperation was necessary between jurisdictions in order to meet the requirements of the new mandates, as well as to effectively plan for growth in the state (DeGrove and Miness 1992, Starnes 1993).

Development and Character of Smart Growth Legislation

The eventual adoption of smart growth legislation in Georgia was surprising to many observers outside the state because of Georgia's history as a place where home rule and private property rights are cherished (DeGrove and Miness 1992, Starnes 1993). In fact, in 1976, the state constitution was amended so that local governments gained the power to establish zoning regulations. The amendment stated that the state legislature could not "in any manner, regulate, restrict, or limit the power of any county, municipality or combination thereof, to plan and zone" (DeGrove and Miness 1992, quoted p.101). This restriction on the state would prove to be short-lived, however. In 1981, on the heels of the environmental and interjurisdictional problems described above, the entire state constitution was rewritten. The new constitution included an amendment that gave the state authority to govern the planning and zoning powers of local governments (DeGrove and Miness 1992, Starnes 1993).

Contributions of Governor Harris

Georgia's smart growth effort was seriously begun under the direction of Governor Joe Frank Harris in the second half of the 1980s (Weitz 1999). Late in Harris' first term as governor, Leonard Ledbetter, the commissioner of the State Department of Natural Resources, convened a meeting in order to discuss what could feasibly be done to manage growth in Georgia. The group he assembled represented all major stakeholders in the process of land use planning. Participants included state, county, and city officials, businesspeople, developers, and environmentalists. It became clear that support for change was widespread. The group concluded that in order to maintain a high quality of life for residents while embracing continued economic growth, an improved system for coordinated planning at the state, regional, and local levels was needed. Ledbetter presented his findings to Governor Harris, who was eager to engineer the changes (DeGrove and Miness 1992, Starnes 1993).

Harris personally took up the cause during his second term in office, and in fact made it the major public policy initiative of his second term. His first action was to appoint a thirty-five member Growth Strategies Commission that was given eighteen months to create a state growth strategy. The commission operated in an open and inclusive manner in order to build a consensus throughout the state. Information and insight was solicited from stakeholders, public meetings were held, and members of the state legislature were briefed on their progress. The commission eventually produced three documents whose recommendations were incorporated without major changes into the Georgia Planning Act of 1989 (DeGrove and Miness 1992, Starnes 1993).

The Georgia Planning Act of 1989

The Georgia Planning Act of 1989 established the "quality growth partnership" prescribed by the Growth Strategies Commission. The system created by the legislation is described as both "bottom-up" and three-tiered in nature. The "bottom-up" designation refers to the fact that local governments develop their plans first, followed by regional bodies, and then by the state (the three tiers) (Bolen et al. 2001). Within this framework, local governments retain zoning powers and discretion regarding development that has "solely a local impact". Further, local governments are not required to plan, as regional governments and the state are (DeGrove and Miness 1992, Johnson 2002, Starnes 1993).

The law consists of five main parts. First is the establishment of the Governor's Development Council. Membership of the GDC includes the governor, who serves as chairman; the commissioners of every cabinet level department, including agriculture, community affairs, natural resources, and transportation; the state school superintendent; the director of the Office of Planning and Budget; the director of the State Soil and Water Conservation Commission; and the director of the Georgia Forestry Commission. The planning act charges council members with tremendous responsibility. Their duties include coordinating, supervising, and reviewing plans of state agencies. In particular, the council is to monitor the planning and construction of public facilities in order to insure they are situated in accordance with local, regional, and state plans (DeGrove and Miness 1992, Johnson 2002, Starnes 1993).

The second part of the 1989 Planning Act describes the state's role in the comprehensive planning process. Most of the responsibilities are given to the Department of Community Affairs, or DCA. The legislation describes this department as “the state’s principal department for developing, promoting, maintaining, and encouraging coordinated and comprehensive planning”. DCA duties include:

1. Establishing standards and procedures for regional, county, and municipal plans
2. Helping regional and local governments to prepare and implement plans
3. Determining the boundaries of regional governments, subject to legislative approval
4. Certifying regional and local governments as “qualified” in accordance with the legislation
5. Gathering information from other state agencies as well as regional and local governments in order to construct a statewide database and information network
6. Reviewing and reporting to the governor the plans of state agencies, regional, and local governments
7. And, establishing procedures for conflict resolution

Clearly, the Department of Community Affairs exercises much power and authority within Georgia’s growth management system (DeGrove and Miness 1992, Johnson 2002, Starnes 1993).

The third part of the planning law establishes the role of regional governments, or Regional Development Centers (RDCs), as they are termed. RDCs are critical to the planning framework implemented in Georgia. Not only do they prepare regional plans based on local plans, but they also perform important checks on local governments. Each city and county in the state must join an RDC and pay membership dues. It is the responsibility of RDCs to review the plans of their component local governments in order to determine if state instituted standards are being met and procedures are being followed. This is a critical issue because based on the RDCs evaluation and recommendation to the State Department of Community Affairs, local governments are determined to be either eligible or ineligible for grants and other types of assistance. RDCs also provide technical assistance to local governments and resolve conflicts that arise between them (DeGrove and Miness 1992, Johnson 2002, Starnes 1993).

The fourth part of Georgia's planning act describes the role of local governments. Cities and counties are encouraged, but not required, to prepare and implement comprehensive growth management plans (Georgia 2000). If a city creates no plan, the county plan applies. If neither a city nor its corresponding county prepares a plan, they are both subject to the regional plan once it is prepared. Cities and counties are also authorized, but not required, to prepare land use regulations and capital improvements plans consistent with their comprehensive plans. The law also states that local plans must be submitted for review by the appropriate Regional Development Council. As described above, the regional body reviews plans for consistency with the minimum planning and environmental standards established by the state (DeGrove and Miness 1992, Johnson 2002, Starnes 1993). It is interesting to note that in Georgia, local governments do not have to plan, but if they do, those plans must be submitted for review. Local governments that do not prepare plans, or whose plans fail to meet state standards, lose their "qualified local government" status, which means that they are not eligible for state grants or loan programs (Georgia 2000).

The fifth and final part of Georgia's planning legislation outlines the role of the state's Department of Natural Resources. The DNR is charged with developing minimum standards for protecting watersheds, wetlands, and aquifer recharge areas. These standards are subject to legislative approval. Plans prepared by state agencies, regional councils, counties, and cities must meet the threshold requirements established by DNR (DeGrove and Miness 1992).

The Minimum Planning Standards and Procedures

As explained above, smart growth legislation in Georgia establishes that local governments are not absolutely required to plan, but they are somewhat coerced to do so. Failure to adopt an acceptable local plan results in loss of "qualified local government" status, making a local government ineligible for certain state funds (Georgia 2000). The state's criteria regarding what constitutes an acceptable local plan were solidified when the Georgia legislature adopted The Minimum Planning Standards and Procedures in 1990. According to the guidelines, local plans must include a description and assessment of existing conditions, a statement of goals and needs, and an implementation strategy. In addition, six elements must be addressed. These are population, economic development, natural and historic resources, community facilities, housing, and land use (DeGrove and Miness 1992).

A number of scholars have expressed surprise at the level of compliance achieved by local governments in Georgia (Bolen et al. 2001, Freilich 1999, Johnson 2002, Weitz 1999). According to a report released in 2002 by the American Planning Association, 99% of local governments have achieved compliance (Johnson 2002). Starnes (1993) suggests that this is because the "bottom-up" nature of the law recognizes the state's traditional culture of home rule. In Chapter IV, I will examine whether or not the high degree of compliance exhibited has been translated into the achievement of smart growth in a selected city in the state. Now I will turn my attention to the evolution of smart growth legislation in Florida.

Florida

The history of growth management in Florida is unique because the state has initiated two distinct waves of reforms- one in the mid-1970s and one in the mid-1980s (DeGrove 1990, Weitz 1999). This long history of state policy directed toward healthy growth eventually helped to mold Florida's 1985 legislative program as one of the most coercive (Johnson 2002, Pelham 1993).

Impetus for Smart Growth: Environmental Crises and Grassroots Activism

The state of Florida experienced massive population growth beginning in the 1950s. This growth put a strain on the state's natural resources as well as critical infrastructure, such as roads and potable water systems. Citizen groups concerned with perceived degradation of the environment became active in the 1960s. Issues of concern included destruction of wetlands, beaches, and dune systems; the threat of salt-water intrusion into the fresh water drinking supply; rampant fires in the Everglades; and contamination of waterways by inadequate sewage treatment (Burby and May 1997, Catlin 1997).

While the environmental movement continued to gain strength in Florida in the 1960s, several issues emerged that propelled the environmental agenda into the state's mainstream policy arena. These were the proposal by the Corps of Engineers to build a barge canal across the state; the Dade County Port Authority proposal to locate a regional airport in the Big Cypress Swamp west of Miami; and a severe drought in the southeastern part of the state due primarily to drainage of much of the Everglades for agriculture. By the mid-1970s, residents, lawmakers, environmentalists, members of the planning community, and other concerned parties were clamoring for change in an atmosphere of desperation (Catlin 1997).

Development and Character of Smart Growth Legislation

Florida is unique in that two different governors played significant roles in the development of smart growth legislation (DeGrove 1990, Pelham 1993). In this section I will discuss the evolution of Florida's program in terms of roles played by these activist governors.

Contributions of Governor Askew

The first steps in the long history of growth management in Florida were initiated by Governor Reuben Askew. Askew convened a conference in 1971 to study the effects of Florida's booming population on the environment, and to recommend ways to reverse the state's water shortage (Weitz 1999). He told members of the conference "a failure to find appropriate solutions to the effective management of growth would be disastrous…" (Catlin 1997, quoted p. 53). Based on the findings and recommendations of the conference, several pieces of legislation were subsequently adopted by the legislature, establishing Florida's first effort at statewide land use management (DeGrove 1990).

These pieces of legislation were: (1) the Environmental Land and Water Management Act (1972), which provided for the preservation of sensitive and endangered areas such as wetlands and sand dune systems; (2) the Water Resources Act (1972), which established five regional water management districts throughout the state; (3) the Florida Comprehensive Planning Act (1972), which required the state to develop a master plan intended to guide policy decisions regarding growth and management of critical areas; (4) the Land Conservation Act (1972), which allowed for the purchase of environmentally sensitive areas; and (5) the Local Government Comprehensive Planning Act (1975), which required that all cities, towns, and counties adopt a local plan that included numerous elements such as future land use, utilities, and conservation (Catlin 1997).

While Florida's growth management legislation was ahead of its time in comparison with efforts in other states, Floridians became frustrated once again in the early 1980s, as it became clear that the initiatives of the previous decade had fallen short of expectations (Burby and May 1997, DeGrove 1990). In addition to ongoing environmental concerns, quality of life issues had become critical. Citizens complained about traffic congestion, poor storm water management, and inefficiency of solid waste services. Public sentiment eventually encouraged a reevaluation of the growth management laws and proposals for major changes. Those concerns would be addressed for the second time by Gov. Bob Graham (Burby and May 1997, Pelham 1993).

Contributions of Governor Graham

In 1982, Governor Bob Graham appointed a committee to study the inadequacies of the existing legislation and recommend improvements. When the final report was submitted in 1984, it contained a long list of factors that were found to have contributed to the failure of the programs. One major factor was that the state did not provide enough funding for successful implementation of the programs. Although substantial financial assistance was initially provided for the development of regional plans, local government plans suffered from inadequate funding. The $50 million in assistance that was supposed to have been distributed by the state according to the terms of the legislation was never realized. Without aid from the state, many small communities simply did not have the financial resources to fully comply with the legislation (DeGrove 1992).

A second reason for failure of the legislation was that it was not followed by a diligent implementation effort. DeGrove (1990) argues that the crisis mentality that helped secure passage of the laws subsided once the legislation was enacted. Two additional reasons the committee established for the legislation's shortcomings concerned the requirements of local government plans. According to the program, local governments' plans were not subject to an approval process, rather, they were only reviewed. Because the procedure lacked "teeth", local governments were not subject to punishment for failure to incorporate recommendations by the state (Burby and May 1997). Also, state requirements for local plans were primarily process oriented. There was no guidance or oversight in regard to substance or quality of those plans (Weitz 1999).

Smart Growth Laws of 1984 and 1985

Based on the findings of Governor Graham's study commission, two pieces of legislation were enacted in 1984 and 1985 that comprised the bulk of Florida's second attempt at effective land use management (Johnson 2002). These were the State Comprehensive Planning Act and the Omnibus Growth Management Act. The laws had two primary components. First, mandatory planning and plan implementation were established at the state, regional, and local levels. Second, new substantive requirements regarding the quality of plans and implementation strategies were instituted (Pelham 1993, Weitz 1999).

In accordance with the laws, the order in which plans are developed in Florida is the opposite of the system that was eventually adopted in Georgia (and described above). While Georgia's local governments plan first ("bottom-up"), in Florida, the state plan is developed first ("top-down") (Starnes 1993). This is known as the *consistency doctrine* in Florida, which is basically an assertion of the supremacy of the state plan, requiring that sub-governments and agencies develop plans that are consistent with those developed by the state (DeGrove 1990).

The state's comprehensive plan that was eventually adopted established the goals and policies that would become the guidelines for the development of all subsequent plans. Twenty-seven policy areas were included, in effect planning for the state's economic, physical, and social growth (Bolen et al. 2001). The second step in the process was for state agencies to produce agency functional plans, or AFPs. These plans describe how an individual agency will accomplish the portion of the state plan it is responsible for. The third step in the prescribed process is the development of regional plans by each of the eleven regional planning councils in Florida. The consistency doctrine requires that regional planning be essentially the translation of the state plan into the various regional plans, in effect accounting for the significant differences across the state. The final stage of the process requires local governments to prepare plans that must be consistent with both the state and respective regional plans. The Department of Community Affairs, a state agency, reviews the local plans for consistency (Weitz 1999). Within one year after a local government submits its plan to the state, it must adopt an implementation strategy describing how the plan will be achieved. Counties and large cities are required to update their plans every seven years. Smaller jurisdictions must update every fourteen years (Bolen et al. 2001).

Consistency Requirements

The consistency doctrine in place in Florida includes both *vertical consistency* and *horizontal consistency.* In both cases the concern is for consistency with the state plan, which is the authoritative document in the Florida system. The procedure outlined above incorporates the requirement known as vertical consistency. This designation refers to the "vertical" flow of the planning method established by the law. Plans made at the local level must be consistent with plans made at the regional level, which is next highest level of government. Local and regional plans must all be made consistent with the state plan, which is at the apex of the hierarchy (DeGrove 1990, Pelham 1993, Starnes 1993).

Horizontal consistency, on the other hand, is the requirement that local plans be compatible with one another. This element forces local governments to consult with each other during the planning process. For example, the establishment and maintenance of hurricane evacuation routes in Florida requires cooperation between local governments because the routes necessarily cross jurisdictions. If neighboring communities have a discrepancy, the regional council can provide conflict resolution services (Burby and May 1997). The same is true with developments of regional impact, or DRIs. If a conflict arises over a large-scale development project that will potentially affect numerous jurisdictions, such as a landfill, the regional council may intercede to settle disputes (Weitz 1999).

Additional Restrictions

Florida's 1985 growth management legislation contains two main foci. One of these is restriction of coastal development. The laws establish a number of policies intended to stop development of barrier islands and other areas susceptible to hurricanes and other severe tropical weather phenomena. One method instituted was the requirement for the development of a "thirty-year erosion line boundary". This boundary is an estimation of where the shoreline will be thirty years in the future, after erosion has caused more of the land surface to be underwater. The law states that no development may take place within this boundary (DeGrove 1990).

The second major focus of the legislation is to reduce the effects of urban sprawl by encouraging compact, high-density urban development. One of the basic strategies for accomplishing this is known as the *concurrency requirement*. The goal of this policy is to stop the long-term trend of local governments allowing development in previously undeveloped areas without requiring that necessary infrastructure be constructed beforehand. As a result of the trend, in many instances facilities and services, including new roads, solid waste disposal systems, and recreation areas, were never constructed (Burby and May 1997, DeGrove and Miness 1992, Pelham 1993). Often, local governments were eventually forced to borrow the money to provide these, a practice called deficit financing (Connors et al. 1992).

The concurrency requirement reverses this trend by establishing a "pay as you grow" system. In accordance with the legislation, after a local comprehensive plan is approved an implementation plan is developed, as described above. This second plan establishes the local land development regulations and the corresponding levels of service the local government intends to provide. Once these plans are in place, a local government is prohibited from issuing a building permit for any area where it cannot be guaranteed that infrastructure will be in place to support the growth when the impact of the growth occurs (Johnson 2002). It should be noted that new development is not necessarily halted by the concurrency requirement. Funding for infrastructure may legally be provided by a variety of sources- from developers, from residents of the new development in the form of impact fees, or from the local government (Connors et al. 1992, DeGrove 1990).

While the 1985 growth management legislation continues to provide the framework for smart growth in Florida, in 1993, additional legislation was adopted in order to fine-tune the existing laws (Freilich 1999). The Growth Management Act of 1993 established a number of important changes. One significant change required that the state plan be reviewed and revised every two years. This was a particularly radical adjustment because the original state plan had not been reviewed since its inception in 1985. A second difference in the 1993 legislation was that the planning and coordination roles of Regional Planning Councils were more clearly specified. One other significant change in the law dealt with developments of regional impact, or DRIs. Some responsibility for reviewing large-scale developments was shifted from RPCs to the local level. The new object was for local governments to strengthen their intergovernmental coordination efforts. With these additions to the 1985 legislation, Florida's core smart growth program was complete (Freilich 1999, Weitz 1999).

Now that I have illuminated the history and character of smart growth legislation in Maryland, Georgia, and Florida, I will turn my attention to the city level analysis.

Smart Growth Programs at the City Level

In Chapter II, I devised an improved state growth management legislation classification system based on the two most useful existing systems. Based on the new typology, I selected three categories of legislation for study and comparison. These categories are: (1) low-coercion/comprehensive, exemplified by Maryland, (2) medium coercion/comprehensive, exemplified by Georgia, and (3) high-coercion/comprehensive, exemplified by Florida. Within Chapter III, I have examined the history, institutionalization, and basic structure of the smart growth programs in Maryland, Georgia, and Florida. I have provided a detailed explanation of how each type of program functions as well as differs from the others. With all of the background information regarding the states' classifications and smart growth programs in place, I must now turn my attention to the local government level.

One of the challenges with this research project has been making the theoretical leap between state level legislation and city level evaluation. The leap is a necessary one. As I discussed in Chapters I and II, in many cases over the last few decades, states have regained control of growth management from local governments. Some states have implemented incentive based programs, while other states have adopted a more heavy-handed approach. In all cases, however, success or failure of state programs must be judged by what happens at the local government level. It is the local governments that must implement state policies, and it is at the local level that policy outputs/outcomes are observed (Burby and May 1997).

In order to bridge the theoretical gap described above, I will consider *city level smart growth policies*. (In Chapter IV, I will discuss why I have chosen to study cities as opposed to other units of local government.) By doing so, I develop a more logical connection between cause (x) and effect (y). The logical sequence of events I will assume is as follows: (1) Smart growth legislation is implemented at the state level (x_1). (2) In response to the legislation, which is incentive based, mandatory, or a combination of both, local governments adopt complementary smart growth policies (x_2). (3) The effects of state smart growth legislation, the primary independent variable; and locally adopted smart growth policy, the intervening independent variable; are both manifested at the local level. Therefore my goal is to conduct a preliminary evaluation of the effectiveness of state level smart growth legislation, taking into consideration manifestation of the programs at the city level.

In the following chapter, I will detail smart growth policies adopted by three cities, Baltimore, MD, Atlanta, GA, and Orlando, FL in order to develop the logical sequence described above. I have selected one city from each state representing one of the types of smart growth legislation I identified earlier. In Chapter IV, I will present a detailed explanation regarding why I selected these cities in particular.

CHAPTER IV

EVALUATING THE EFFECTIVENESS OF SMART GROWTH PROGRAMS

Evaluation as Part of the Policy Process

Evaluating the impact of a program is a crucial, and often difficult, part of the policy process. Public programs may be expanded, altered, or discontinued based on the information assembled. With increasingly tighter budgets, yet greater demands for services, the information collected in the evaluation phase is critical (Lindblom and Woodhouse 1993). This has proven to be an obstacle for policy entrepreneurs trying to "sell" smart growth programs at the state level. The impact of smart growth policies may take years, some would argue decades, to observe. Politicians are often reticent to champion a program that does not produce immediate results. In order to satisfy constituencies, the politician must produce results quickly, or at least appear to (Smith 1991). This is simply not conducive to programs associated with smart growth. The politicians who successfully implement smart growth programs likely will not get credit should the programs be demonstrated as effective. Instead, the fortunate officeholder perhaps 15 years later might receive the praise, after desired policy results have been realized (DeGrove 1990, Innes 1993, Leo et al. 1998, Pelham 1993, Popper 1981).

Studies evaluating the results of smart growth programs have been limited largely because of the time required for outcomes to be manifested. It should be restated at this point that programs of this type at the state level have typically been in existence for ten or 20 years (Connors et al. 1992, Johnson 2002, Weitz 1999). In many instances, "policy outputs", or short-term quantifiable results, are beginning to be measured, while it will be many more years before the associated “policy outcomes”, or long-term qualitative results, are observable (Lindblom and Woodhouse 1993). For example, the policy outputs of a brownfields revitalization effort can begin to be measured months after implementation. One measure might be the number of businesses that have completed the application process and purchased property. Whether or not the desired policy outcomes occur would not be known for perhaps a decade. Would the areas in question once again be centers of activity complete with thriving industries, shops, restaurants, and pedestrian traffic? Would a significant amount of valuable greenspace outside the city be preserved? These are questions of policy outcomes, which can be evaluated only after programs have been in place many years.

While it is premature to determine conclusively how well smart growth initiatives work, an evaluation of their effectiveness is the goal for policy analysts (Bollens 1992, Burby and May 1997, Gale 1992, Knaap “Talking” 2002). One method that has been used to gain insight into the potential outcomes of smart growth programs is forecasting with computer models (DeGrove 1990). Another method is estimating outputs based on the effects of similar programs instituted elsewhere. As discussed in the previous chapter, Knaap (“An Inquiry” 2002) made predictions about the effectiveness of Maryland’s unique priority funding areas program based on his observations regarding the use of urban growth boundaries in other states.

Limited evaluative studies of smart growth policies have been conducted. Many have been case studies. While most social science case studies are descriptive in nature and designed to produce rich detail, some include an evaluative component (Campbell and Stanley 1963). In fact, a literature search for this subject produces dozens of case studies utilizing a variety of rudimentary evaluative approaches (Cohen 2002, Liou and Dicker 1994, Stein 1993). Many of them provide a detailed study of a single jurisdiction. For example, Catlin (1997) describes social, economic, and environmental conditions in communities in Florida before and after implementation of smart growth legislation. Another common approach is to compare the experiences and outcomes in two states that have adopted different types of smart growth programs (Bierbaum 2001). Carefully constructed case studies are an important tool for collecting detailed analysis of the experiences of one or more communities (Campbell and Stanley 1963). I will employ a modified case study method in this research, which I will detail below.

Methods

In Chapter II, I developed a classification system for state smart growth legislation. Three basic types of smart growth programs were shown to be in place among less than half of all states. These are low-coercion/comprehensive programs, exemplified by Maryland, medium-coercion/comprehensive programs, exemplified by Georgia, and high-coercion/comprehensive programs, exemplified by Florida. To provide a deeper understanding of how those types of programs function as well as differ, in Chapter III, I examined the history, institutionalization, and basic structure of the smart growth programs in Maryland, Georgia, and Florida. The next logical questions are: *Do they work? If so, which of the three types works best?*

In this chapter I will present and interpret secondary data, or data that has been collected by other sources, to provide preliminary answers to these questions. First, one city must be chosen from each of the states representing the three types of smart growth legislation I have identified. As stated in Chapter III, these cities are Baltimore, MD, Atlanta, GA, and Orlando, FL. The rationale for selecting these particular cities is detailed below.

Second, I will discuss the *intervening independent variables* considered in this research. Sometimes independent variables affect dependent variables partially or fully through intervening variables. While intervening variables are responsible for changes in y, ultimately the independent variable is causal (Campbell and Stanley 1963). In this research, the independent variables (x_1) are state smart growth legislation; the intervening independent variables (x_2) are local level smart growth programs; and the dependent variables (y) include an array of indicators, such as local air quality and local traffic congestion. In other words, I expect that there is a logical, causal link between the independent, intervening, and dependent variables, as described above.

My third task is to develop a list of dependent variables that are reflective of the goals of smart growth legislation. In a following section I will detail which dependent variables were selected and why they were selected. I will collect time series data for the selected dependent variables, or indicators, as I will also refer to them. In the instances where appropriate historical data is available, measures for the variables will be compared from before and after smart growth was implemented at the state level. I will analyze the effectiveness of the programs based on an examination of the trends in the dependent variables. In each case, I will consider how the trend has evolved within the unique context of each city.

Finally, in Chapter V, I will draw conclusions regarding the impacts of smart growth policies on the dependent variables in each city. I will make a preliminary determination as to which of the cities has been most successful with achieving smart growth objectives based on my analysis. Based on this determination, I will make provisional inferences as to which of the three types of state smart growth legislation is most effective.

I use the word *preliminary* in regard to the evaluations and conclusions of this research in part because legislation of this type is fairly new. As I stated in the opening of this chapter, if smart growth policies do produce desired results, they may not be entirely evident at this point in time. Even so, evaluating effectiveness is critical to the cyclical nature of the policy process (Lindblom and Woodhouse 1993). The findings of this research may be combined with other recent evaluative studies to reach a tentative conclusion about the effectiveness of state initiated smart growth programs.

Selection of Cities

I will use Baltimore, Atlanta, and Orlando to represent the states of Maryland, Georgia, and Florida for several reasons. One reason is that all three are metropolitan areas with populations exceeding one million (Bureau of Census "State" 2004). According to 2000 census data, Baltimore has a population of 2,552,994 people; Atlanta has 4,112,198 inhabitants; and Orlando has a population of 1,644,561. The sheer size of the cities acts as a magnifying glass for this research. That is, if sprawl has produced pathological trends, and if these trends are affected by smart growth measures, I would expect to observe these things more easily in large cities than in small cities.

Another reason for selecting these cities is that each has a reputation as a sprawling monolith, with a voracious appetite for greenspaces, farmland, and other rural areas ("Per Capita" 1990, "Sprawl Guide" 2000). I am especially interested in what has happened in these cities because they are generally recognized by researchers as "sprawling" areas (Burby and May 1997, DeGove and Miness 1992, Johnson 2002, Knaap 2002, Weitz 1999). If smart growth legislation has positively impacted growth factors in these cities, I might reasonably expect it to have benefits in other cities, where the implications of sprawl have been less severe. On the other hand, it stands to reason that the opposite might instead be true. It may be that desired effects of the legislation are seen in the test cities because of the tremendous extent of damage from sprawl; while smaller cities, or cities with a lesser degree of damage from unhealthy growth, would less likely exhibit dramatic improvement. While my research is limited to the evaluation of Baltimore, Atlanta, and Orlando, contemplating the results of similar studies on smaller cities, or those with less profound damage, is tantalizing and suggests an avenue for future research.

Finally, I will use these three cities because data and information is available for each. Census data are available for each metropolitan statistical area (MSA) and its component parts. This means that, for example, I know how many people live within the city limits of Orlando and how many live in the suburbs. These two numbers added together make up the MSA population estimates. The Census division between central city and suburbs is particularly useful to portions of my research that require a comparison between the two areas. Information on housing, poverty, and other variables is also available for these cities (Bureau of Census "State" and "Summary" 2004).

Selection of Dependent Variables

I will conduct a preliminary evaluation of the success of smart growth legislation by examining relevant dependent variables, or indicators, for Baltimore, Atlanta, and Orlando. The evaluation is divided into parts based on the objectives of smart growth policies identified in Chapter II. Within each section, I will examine the change over time in a number of dependent variables. These variables are used to determine whether or not the corresponding objectives are being met in each city. Variables are chosen so that when examined together they are reflective of some aspect of the respective objective. The following is a listing of the five main smart growth objectives and the indicators I will examine for each.

Objective #1: Revitalize central cities
- A. *Health of central cities v. suburbs*
  1. Population trends
  2. Segregation trends
  3. Poverty trends

Objective #2: Control Development
- A. *Population density*
  1. Population density per sq. mile of land
  2. Population v. land area

Objective #3: Create and improve transportation options
- A. *Roadway congestion*
  1. Roadway Congestion Index
  2. Annual highway congestion costs
  3. Annual hours of traffic delay per person
  4. Annual wasted fuel due to congestion

Objective #4: Protect natural resources
- A. *Air quality*
  1. Good v. unhealthy air quality days
  2. Ozone v. particulate matter days

Objective #5: Create equitable, desirable neighborhoods
- A. *Housing*
  1. Total units available
  2. Median household rent
  3. Housing cost burden
  4. Households with "any housing problems"

I will use Objective #4 to illustrate. The fourth objective of smart growth programs is to protect natural resources. This goal includes many component goals, so I chose to limit my evaluation to protection of air quality. In order to determine if the quality of air in my three test cities was improving or declining after smart growth legislation adoption, I analyzed time series data for several variables. I compared healthy air days with unhealthy air days over time. I also compared ozone days with particulate matter days over time. If smart growth legislation has impacted air quality in these cities, I expect to see a change in air quality, as evidenced by these indicators, after the date of program implementation. I will further clarify my research procedures in the following sections.

Research Design

This research is based on a number of *pretest-posttest* designs and several *posttest only* research designs. As mentioned above, in every instance possible, data was collected from both before and after implementation of *x*, the smart growth programs. Many of the designs are longitudinal in nature, including both multiple pretests and multiple posttests. These take the following basic form (where *x* is the point of program implementation, and the 0s are sequential observations, or data points, both before and after the program began):

$$0_1 \quad 0_2 \quad 0_3 \quad x \quad 0_4 \quad 0_5 \quad 0_6$$

Of the designs employed in this research, this type is most desirable from a methodological perspective because it allows for examination of the trend before program implementation (Campbell and Stanley 1963). This point will be further discussed in the next section.

Due to data constraints, a few of the dependent variables will be examined utilizing the *posttest only* design. These take the following form (where *x* is the point of program implementation, and the 0s are sequential observations, or data points):

$$x \quad 0_1 \quad 0_2 \quad 0_3$$

The drawback with using the *posttest only* design is that it does not provide an examination of the dependent variable before *x*. This makes it more difficult to exclude rival explanatory factors. For example, if *x* is a new law requiring the use of seatbelts, and three observations, or measurements, taken after implementation of *x* show a steady decrease in the incidence of traffic fatalities, it is not necessarily the case that *x* was responsible for *y*, the decrease in fatalities. Pretest measures of fatalities, which are not considered in this example, may have shown a gradual decrease in fatalities over the previous 10-year period, perhaps attributable to a decrease in the number of teenagers in the area. In short, if no data are available from before program implementation, it seriously limits the ability to establish *x* as causal (Campbell and Stanley 1963, Nachmias and Frankfort-Nachmias 1996).

Both of these types of research designs are considered to be "pre-experimental" in nature (Campbell and Stanley 1963). Experimental designs, while generally desirable, are often difficult to employ in social science because the researcher cannot exercise a high level of control over the test subjects or their environment. A true experimental design is methodologically sound because it includes a control group and randomized selection of test subjects. The inclusion of a control group allows for comparison between groups exposed to *x* and groups unexposed to *x*. The randomized selection of test subjects means that those people, cities, or other subjects, are representative of the entire population, and research findings can be generalized from the sample to the population as a whole. The "pre-experimental" designation of the designs included in this research presents certain methodological challenges that are detailed in a following section (Campbell and Stanley 1963, Nachmias and Frankfort-Nachmias 1996).

Case Study Approach

This research essentially consists of three case studies on the effects of smart growth programs in Baltimore, MD, Atlanta, GA, and Orlando, FL. They may be considered to be case studies because for each of the three, I examine: (1) the respective state legislation, the primary *x* variable; (2) local level programs, the intervening *x* variable; and (3) measurements of numerous dependent variables. For each city, I consider results of the data analysis in light of the city's planning or growth management background and in light of the circumstances that make each city unique, such as history, geography, and social conditions. In other words, this is not strictly quantitative evaluation, but also includes a detailed look at each city.

Case studies are an important part of the process of understanding or predicting phenomena. They are usually employed as the front line research technique in the analysis of new or otherwise previously un-studied research subjects. They are used first because when a subject is new to researchers, data and information regarding the subject are generally limited. Data collected through the case study approach may consist of a combination of objective, quantifiable measures, and subjective information, such as interview responses and personal accounts (Babbie 1998, Nachmias and Frankfort-Nachmias 1996).

Case studies also provide critical research avenues when no other approach may be employed. For example, the best way to understand a primitive tribe isolated in a rain forest may be to live among them for several months, collecting information in a case study approach. It would certainly be impossible to select a random sample from the population of existing primitive tribes in order to administer a written survey (Babbie 1998, Nachmias and Frankfort-Nachmias 1996).

Case studies are also important for the rich detail they provide. This contrasts with the sometimes sterile or clinical nature of purely quantitative studies (Babbie 1998, Nachmias and Frankfort-Nachmias 1996). In case studies, personal stories from individuals and vivid descriptions by researchers develop an intimate, realistic understanding of a subject or event. For instance, studies of the American presidency usually contain stories and remembrances by presidents that add a depth of insight into the office perhaps impossible through the mere manipulation of numbers (DiClerico 2000). The negative aspect of this is that it is harder to develop and test theory from a collection of case studies than from statistical studies, for example. Research methods utilized within case studies vary, which complicates the compilation of data, a standard precursor to theory development. On the other hand, case studies do help researchers develop testable hypotheses. For example, accounts of experiences with a number of primitive tribes may lead to the hypothesis that matriarchic tribes are less aggressive than patriarchic tribes (Babbie 1998, Nachmias and Frankfort-Nachmias 1996).

In conclusion, the case study approach has been useful to this research in a couple of ways. One is that because smart growth legislation is fairly "young" from a policy implementation perspective, I have used the approach to collect basic information regarding both state and local programs as well as local conditions the programs are designed to address. For example, there is no database cataloguing what smart growth programs cities have in place. In order to assemble that information, I have scoured city documents, web sites, and other sources.

The case study method has also been helpful with interpretation of data. Instead of relying primarily on numerical data, I have taken each city's unique features into consideration as part of the analysis. This has allowed me to have a fuller understanding of smart growth in the cities. For example, an examination of the data shows a decline in the cost of rent in Baltimore's central city (Bureau of Census "State" 2004). When this information is considered in light of the city's struggle against poverty, crime, and inner-city abandonment, it becomes clear that a decline in the cost of rents in Baltimore is not in line with smart growth objectives. The decrease is, instead, indicative of deteriorating housing stock and low levels of consumer demand due to continued flight to the suburbs (City of Baltimore 2004).

Methodological Challenges

Determining the effectiveness of smart growth programs presents a number of methodological challenges. One is demonstrating a causal link between the change in each dependent variable and introduction of the independent variable, smart growth programs. A second challenge I face is selecting *y* variables for analysis that are valid indicators of the five smart growth objectives listed above (Babbie 1998, Campbell and Stanley 1963, Nachmias and Frankfort-Nachmias 1996). In order to support the methodological stability of this research design, I will need to address a host of issues related to causality and validity. These issues are detailed in the following sections.

Causality

One of the most basic concerns I have is satisfying the criteria for causality. For any of the effectiveness measures to be meaningful, I must be reasonably certain that smart growth programs, and not some other independent variable(s) cause the phenomena being measured. The requirements for causality are that: (1) the cause precedes the effect in time; (2) a change in one variable is associated with a change in the other (correlation); and (3) plausible rival hypotheses are excluded (Lazarsfeld 1959). I want to show that in each of the three cities, state initiated smart growth programs are responsible for the changes in dependent variables I will present.

The first criterion will be easily satisfied because I know when the independent variable, the legislation, was implemented in each state. The years of legislation adoption were 1992 and 1997 in Maryland, 1989 in Georgia, and 1985 in Florida. I want to establish the smart growth legislation as causal; therefore, my goal will be to observe changes in the dependent variables *after* these years.

The second criterion of causality, correlation of variables, is somewhat more challenging to demonstrate. The dependent and independent variables must be shown to change together over time. Within this research, some change must be recorded in the dependent variable after the independent variable is introduced (Lazarsfeld 1959).

Accordingly, in each instance possible, a measure of each dependent variable will be obtained from the time period both before and after implementation of the legislation. In short, I expect to find that when state legislation changes to include smart growth programs, there will eventually be a change in population density, for example.

The challenge of insuring correlation will be obtaining data for dependent variables that meets three criteria. One is that the information must be of sufficient quality and detail that I can observe significant changes over time. A second concern is that ideally I need data points from both before and after program inception. Lastly, the data for each *y* variable must be uniform with regard to the manner in which it was collected and reported (Babbie 1998, Campbell and Stanley 1963, Nachmias and Frankfort-Nachmias 1996).

I have made every effort to obtain data for the dependent variables that meets these requirements to the greatest degree possible. Due to the difficulty of collecting secondary data that meets the prescriptions of this research, some of the data I will utilize does have limitations. One limitation is that in several cases, data was not available for indicators prior to the adoption of smart growth legislation. For example, EPA air quality data I will utilize begins with 1993, four years after Georgia's smart growth legislation was enacted (EPA "AirData" 2004). The second limitation is that in some cases, data is only available for decennial census years. As a result, my analysis of the difference in rental housing costs between inner cities and suburbs, for example, is restricted to one data point every ten years. I could gain a more detailed understanding of rental cost trends if data had been collected, for instance, every five years.

The third criterion of causality will not be easily satisfied. Public policies such as smart growth programs are rarely concluded to be the sole cause of any phenomenon. This is often true for social science research when it is impossible to control for spurious or confounding factors. In the case of smart growth legislation, policies are implemented to produce changes in the conditions of variables, while those variables may continue to be affected by a variety of other factors. If the desired change in conditions is realized, it may be unclear whether that change was due to smart growth legislation or some alteration of those factors that were previously causal (Lindblom and Woodhouse 1993, Campbell and Stanley 1963). For example, heavy traffic congestion in a city may be caused by an increased number of tourists, ongoing roadway construction, or a decrease in the cost of gasoline. If a decrease in congestion is recorded after a smart growth initiative is launched that provides incentives for individuals to use public transportation, the decrease in congestion may still potentially be accounted for by a variety of other factors. In order to determine conclusively what caused the improvement in traffic conditions, number of tourists, roadway construction records, and gasoline price trends would all need to be examined in addition to the smart growth initiative.

In social science research, and in policy analysis in particular, it is not easy to identify all competing causal factors and systematically eliminate each one. Possible rival hypotheses, such as gasoline price trends in the above example, may be mathematically controlled for, and potentially eliminated as causal, if certain statistical methods, such as multiple regression, are used. In this study, however, where the n is very small, regression cannot be employed (Babbie 1998). Therefore I will use a number of other means in order to rule out competing explanations. First, I will rely on theory to guide selection of dependent variables. In other words, I will use variables in the analysis that one could reasonably expect to be affected by the programs. Second, I will use multiple indicators to evaluate each objective. This will allow me to obtain a more thorough understanding of what changed and how. Third, wherever possible, I will compare the values of the dependent variables in each city with "average" values for cities of approximately the same population. This comparison is helpful for identifying unusual trends. Each of these three approaches contributes to a fuller understanding of how a variable has changed over time, and ultimately, whether smart growth policy may be responsible (Babbie 1998, Nachmias and Frankfort-Nachmias 1996).

Finally, I will consider "pre-test" data in instances where it is available. In other words, when possible, I will examine the overall trend in the values of dependent variables *before* the program was implemented. This practice will allow me to determine whether "post-test" values, or those observed after policy implementation, are simply artifacts of the historical trend, or whether they are real changes possibly caused by smart growth laws (Babbie 1998, Nachmias and Frankfort-Nachmias 1996). For example, if the number of new homes being built on a vulnerable coastline has been decreasing steadily in the ten years preceding a smart growth program geared in part toward that end, then a continuation of that trend cannot be fully attributed to the program. In sum, the historical trend of a variable can be a sort of competing explanation that I will consider as part of the policy evaluation whenever possible.

Validity

In addition to causality, validity is another methodological challenge for this research. To achieve validity, I must measure what I am intending to measure and not something else (Babbie 1998, Lazarsfeld 1959, Nachmias and Frankfort-Nachmias 1996). While this sounds like a simple task, it is not. For example, if I wanted to know whether city officials were attempting to make a community more pedestrian friendly, I could measure the number of miles of sidewalk installed as part of the initiative (assuming such information was available). Sidewalks are paved expressly for protecting pedestrians from traffic, and not meant for bicyclists or those utilizing any other means of personal transport. That would be a single valid indicator of a program designed to encourage pedestrians. On the other hand, obtaining information regarding the number of pairs of sneakers sold in a community is not a valid indicator of the hypothetical program described. There is, at best, a weak causal link between sales of sneakers and increasing foot traffic in a community. I might argue that many individuals who buy sneakers do so because those types of shoes are comfortable, and that those individuals may have no intention of changing their transportation habits.

My goal is to measure the effectiveness of state initiated smart growth laws at the city level. I will strive for validity in respect to my goal by employing several tactics. One is that I will reduce the concept *smart growth* to the five objectives detailed in Chapter II and outlined above (Babbie 1998). These are to protect natural resources, create and improve transportation options, control development, revitalize central cities, and create equitable, desirable neighborhoods. I will then select indicators for each of these five objectives. This contributes to validity because the concept of smart growth includes many diverse facets. In order to gain a true picture of success or failure with smart growth, each of the five objectives must be included in the analysis.

My second tactic for insuring validity is that I will analyze several indicators for each of the objectives. This is a practice known as triangulation (Babbie 1998). My rationale is that my understanding of long-term trends in roadway congestion, for example, will be more complete if I analyze four indicators rather than one. To clarify, for the second smart growth objective of creation and improvement of transportation options, I will examine four indicators of roadway congestion. These are the Roadway Congestion Index produced by the Texas Transportation Institute (2001), annual highway congestion costs, annual hours of traffic delay per person, and annual wasted fuel due to congestion.

Thirdly, I have sought to maximize validity by using standard indicators of smart growth that are commonly referenced in academic literature (Babbie 1998). While the indicators are widely used, each has been controversial in some way. I will address the criticisms of each indicator and my defense of the use of each in the data presentation and analysis section of Chapter IV.

Individuality of Cities

The smart growth initiatives adopted by Baltimore, Atlanta, and Orlando are as unique as the state level legislation associated with each. While each of the cities has exhibited the usual conditions associated with sprawl, their unique history, location, and culture have created some growth management concerns that are specific to each. In this section I will detail the most serious growth concerns, followed by major smart growth programs for each of the three cities. Where possible I will list local smart growth initiatives according to which of the five smart growth objectives each is intended to accomplish. In many cases, as will be shown below, however, a single program is designed to address multiple goals.

Baltimore, MD

The City of Baltimore offers many amenities to residents, investors, and tourists, including a busy Inner Harbor and notable research universities such as Johns Hopkins. However, the city also has many challenges to overcome in order to achieve smart growth and secure the loyalty of those groups (City of Baltimore 2004).

Long-term Challenges

Baltimore is a classic example of an "old" city (established in 1797) that boomed during the Industrial Revolution and through World War II, then steadily lost population, economic investment, and jobs after that time. Gradually, residents who could afford to do so left the inner city for the suburbs, sparking a chain reaction of events that the city has yet to recover from. According to one report, the city lost about 1/3 of its population from 1950 to 2000 ("Plan" 1999). Furthermore, as recently as 2001, there were 14,000 vacant and uninhabitable properties in the city. Combined with the 4,000 habitable yet vacant city properties, there were a total of 18,000 vacant buildings in the City of Baltimore that year. These facts illustrate the continuing severity of Baltimore's inner city abandonment (City of Baltimore 2004).

The exodus of the middle class left a mainly poor, mainly minority population in the city of Baltimore. Many jobs also left the city as businesses relocated to the suburbs. Joblessness and poverty were reinforced as buildings and infrastructures deteriorated, discouraging new business investment ("Plan" 1999). In short, a perpetual cycle of poverty developed within the inner city, where jobs were unavailable because they had moved to the suburbs, and no new jobs were created because businesses did not want to invest in the decaying city (City of Baltimore 2004). According to David Rusk (1996), former mayor of Albuquerque and urban studies scholar, the results of these conditions were high crime rates, drug addiction, family disintegration, and welfare dependency, all part of what he calls "social dynamite".

Another major concern for growth advocates in Baltimore is related to the educational attainment and job skills of the citizenry. Statistics provided by the city starkly illustrate the concern. For instance, in 2001, 57% of Baltimore's adult workforce did not complete high school, compared with 11% at the national level. Further, only 16% of the city's workforce had any college or other post-secondary training. City officials maintain that improvement in these areas would not only lead to a better quality of life for citizens, but would also draw businesses that need educated employees. A large part of the problem is the poor quality of schools in the inner city. Not only are inner city students disadvantaged, but flight from the city is reinforced, as middle class families with children move to areas with better schools (City of Baltimore 2004).

As awareness of these conditions increased, the city did begin limited revitalization efforts in the 1960s. For example, the shoreline of the Inner Harbor was opened to the public in 1964 as a means of encouraging foot traffic and repopulation of both commercial and residential neighborhoods near the waterfront. However, critics have charged that in the decades since World War II, city officials in Baltimore have simply "managed the deterioration" of the city, rather than forging strategic initiatives toward revitalization (City of Baltimore 2004, "Plan" 1999).

Finally, environmental degradation has also been a major concern for residents of Baltimore. As I detailed in Chapter III, concern for the health of the Chesapeake Bay was a primary factor in the initiation of growth management in the State of Maryland. While residents of Baltimore are sentimental toward the Bay, the city has contributed to its pollution over time. Environmental abuses occurred during Baltimore's development as a seaport and shipbuilding center on the Chesapeake ("Smart Growth in Maryland" 2003). In addition, air quality is a serious concern in Baltimore. Decades of automobile exhaust and industrial air emissions led to unhealthy air quality in the city. In fact, Baltimore is currently a "nonattainment" area for safe ozone levels, as designated by the EPA (EPA "National" 2000).

In the next section, I will discuss some of the smart growth programs implemented in Baltimore in order to improve the conditions described above.

Local Smart Growth Initiatives

In order to address the City of Baltimore's concern with the profound loss of population and prosperity in the central city, many initiatives have been adopted that have the triple purpose of revitalizing the city, increasing population density, and creating affordable housing in the city. One creative program is called Buying Into Baltimore. The program consists of periodic home-buying fairs that concentrate on different areas of the city. On Fair days, the public is invited to take trolley tours of a section of the city in order to see the homes that qualify for the program. The city then rewards the first 50 individuals who buy homes within 90 days with $3,000 toward downpayment costs. Participants are also invited to homeownership and renovation mini courses the day of the Fair (City of Baltimore 2004).

Another initiative with a similar purpose is the Baltimore City Employee Homeownership Program. City employees who buy homes within the city limits may receive a $3,000 loan that "evaporates" at the rate of 20% a year over five years. If the home is located within certain neighborhoods targeted for revitalization, the city employee may receive an additional $750. According to Baltimore's Department of Housing, over $5 million has been distributed by the city for the costs of this program since it began in 1994 (City of Baltimore 2004).

The City of Baltimore has launched numerous other revitalization efforts in the downtown area. A primary strategy for revamping economic development has been to focus on improving existing assets in order to attract new business investments ("Plan" 1999). For example, one goal has been to leverage the prestigious universities and colleges located in the area to create university-industry partnerships, attract students and talented faculty, nurture innovation, and create business opportunities. According to city officials, improvement to the physical environment surrounding the city's universities and colleges will attract research firms whose dealings with the schools require that they be located near one another. In short, officials believe that there is a reciprocal relationship between the healthy growth of Baltimore and the healthy growth of the city's universities and colleges (City of Baltimore 2004).

The city is also dedicated to improving the quality of its public schools and increasing the education level of its population as a whole. According to city documents:

> *"An educated and skilled workforce is one of the most important factors in an area's ability to attract businesses and help them grow and prosper. Therefore, building the skills of our most critical asset-our human capital-must be at the heart of Baltimore's economic growth strategy" (City of Baltimore 2004, quoted p. 9).*

In accordance with this view, Baltimore offers a variety of programs to increase the education and job training levels of its citizenry, and to prevent families with children from leaving the central city area. Programs provided by the city include high school drop out prevention, computer learning both in schools and in public centers throughout the community, career skills for high school students, after school programs, and GED completion programs for adults. In addition, the city's Department of Labor Youth Opportunity initiative provides young residents with many resources and support systems designed to encourage completion of high school (City of Baltimore 2004).

In addition to improving existing physical assets as well as human resources, the City of Baltimore continues to focus on eliminating "crime and grime". Many historical buildings that were once used for industrial purposes, and then abandoned, have been converted to retail or office space. The city also routinely sponsors neighborhood cleanups (City of Baltimore 2004).

The City of Baltimore accomplishes most of its transportation planning by participating in the Baltimore Regional Transportation Board (BRTB). Membership on the BRTB also includes the city of Annapolis, the counties of Anne Arundel, Baltimore, Carroll, Harford, and Howard, the Maryland Department of Transportation, the Maryland Department of the Environment, and the Maryland Department of Planning. The

Baltimore metropolitan area has an extensive transportation infrastructure to maintain and improve. In addition to the highway system, planning efforts also include the BWI airport, the Port of Baltimore, Amtrak's Penn Station, and MARC trains. The BRTB seeks to improve and promote these structures and services in order to retain and encourage business growth in the city, enhance local quality of life, and promote tourism (City of Baltimore 2004).

Both the city and the BRTB emphasize the importance of public transportation options as a means of reducing traffic congestion and improving air quality. The city provides both rapid rail and bus service. Baltimore is unusual in that over 6% of inner city workers use public transportation. Even so, the percentage using mass transit actually fell from 7.7% in 1990 to 6.2% in 2000 (City of Baltimore 2004). According to a Baltimore citizens' group, the relocation of jobs from the city to the suburbs, combined with the mismatch in bus service between workers' homes and employment places, have both led to a decrease in use of mass transit (National 2000).

Improving air quality, particularly in terms of ozone formation, is a top concern for the city and the region as a whole. In addition to encouraging the use of public transit as a means of reducing auto emissions, the city also seeks to improve air quality by educating the public. A major awareness campaign is called the Ozone Action Days Program. When high ozone level days are forecasted, and when they occur, the city initiates the Code Red Ozone Action Day Plan. Citizens are advised of the plan through local television newscasts, print news sources, Internet sources, and an extensive employer participation program. Individuals are encouraged to protect themselves by limiting outdoor activities, and they are also encouraged to stop behaviors that contribute to ozone formation. The city provides some free bus service on high ozone days in order to reduce car emissions. In addition, citizens are asked to postpone the use of gas powered lawn equipment, oil-based paints and aerosols, and to ignite charcoal fires with electric lighters rather than lighter fluid (City of Baltimore 2004).

Finally, the City of Baltimore has implemented numerous programs to increase homeownership, some of which are described above in connection with city revitalization efforts. In addition to offering properties for sale, the city also provides programs designed to prepare first time homebuyers for their purchase. One of these is called the Family Self Sufficiency Program. After completion of certain courses offered through the program, individuals become eligible for special loans and other financial incentives from the city (City of Baltimore 2004).

I will now examine the characteristics and healthy growth strategies for the City of Atlanta.

Atlanta, GA

Atlanta is a city noted for its racial diversity, prime location in terms of both commerce and climate, and big city amenities. However, these features that make the city desirable to many people have also led to serious problems (Bullard 2000). In this section I will detail some of those challenges as well as efforts to address them.

Long-term Challenges

The topography of northern Georgia has had various effects on the development of Atlanta. The land area is flat and completely landlocked, so there are no mountains or bodies of water nearby to form natural growth boundaries. This has had the effect of allowing Atlanta to sprawl outward in every direction. In fact, the Atlanta metropolitan area includes 20 counties (Bullard 2000).

The location of the city has also contributed to its designation as a major transportation crossroads. In the early twentieth century, manufacturers wishing to ship their goods discovered that transport across the rugged Appalachians could be avoided altogether if a more southerly route through Georgia was used. The Atlanta region gradually became a transportation hub for highway, railway, and airway travel (Bullard 2000).

The associated economic and physical growth of Atlanta led to unique growth management concerns. Race related social inequality, severe traffic congestion with associated poor air quality, and the "urban heat island" effect are some of the major challenges that must be addressed by planners in Atlanta (Bullard 2000, Chapman 2000, Jaret et al. 2000).

Racial disparity, particularly in the area of housing, continues to be a serious issue in the Atlanta metro area. Torres, Bullard, and Johnson (2000) have shown that while the availability of affordable housing has increased in Atlanta, residential sections of the city continue to be highly segregated. Both black and white households have moved from the city to the suburbs, but these two groups move to separate suburban neighborhoods. Torres et al. (2000) examined the *Index of Dissimilarity* between blacks (and other minorities) and whites from 1970-1997 and determined that segregation had not changed dramatically in the metropolitan area during those years. This index is used to measure the concentration of racial groups in comparison with one another within a specified geographical boundary. At the county level, these researchers concluded that there had only been slight improvement in dissimilarity from 1980 to 1997. The index measure declined from 45.2% in 1980, to 44.4% in 1990, to 43.6% in 1997. Torres and his co-authors also noted that there was a slight decline in dissimilarity at the "superdistrict" level, or inside the counties. The black and white populations in Dekalb county, for example, were somewhat more evenly distributed in 1997 than in 1970. In sum, while the Index of Dissimilarity shows modest improvement in racial segregation, Torres, Bullard, and Johnson (2000) concluded that overall segregation had not drastically changed during the years under consideration.

Traffic congestion and the air pollution associated with it are also serious problems for both citizens and visitors of Atlanta (Chapman 2000, City of Atlanta 2004). Traffic congestion in the Atlanta metropolitan area reached a level of severity that prompted Governor Roy Barnes to provide oversight for the development of the Georgia Regional Transportation Authority (GRTA) in 1999. GRTA is responsible for planning and implementing regional mass transit in any county that achieves "nonattainment" status from the EPA. Thirteen of the twenty counties that make-up the Atlanta metro area have been designated as nonattainment areas for safe ozone levels (EPA "National" 2000). Plans for reducing traffic congestion and improving air quality often overlap in Atlanta, as well as in the other cities, because car emissions are believed to be the most significant cause of poor air quality (Chapman 2000).

Another serious concern for residents of Atlanta is the city's loss of tree cover. Atlanta has become what is known in the scientific literature as an " urban heat island". As described in the previous chapters, when trees and greenspaces are replaced with paved roads and dark colored buildings, heat becomes trapped and the temperature of the city rises. Not only does concrete retain heat, but also fewer plants means a loss of the evaporative cooling effects produced by vegetation (Audubon 2001). This effect is particularly remarkable in "Hotlanta", where on a sunny summer day; downtown can be as much as 12° Fahrenheit hotter than the surrounding areas. According to data from NASA's Landsat satellite, the Atlanta metropolitan area lost about 190,000 acres of tree cover from 1988 to 1998. In addition to the obvious physical discomfort, loss of tree cover in Atlanta has resulted in increased energy consumption, higher electric bills, pollution, soil erosion, and flooding (Creech and Brown 2000).

Local Smart Growth Initiatives

The City of Atlanta has implemented many smart growth initiatives that are reflective of smart growth policies adopted by the State of Georgia. While some of the city's programs are limited in scope and designed to achieve a single goal, such as insuring pedestrian safety, many of the programs are designed to achieve multiple smart growth goals (City of Atlanta 2004).

In terms of central city revitalization, the City of Atlanta offers a variety of financial incentives to encourage economic growth in existing urban areas. The Business Improvement Loan Fund is a program that provides financing to businesses in distressed areas for building improvements or equipment purchases. The Fulton County/City of Atlanta Land Bank Authority is another incentive program. It enables the city to forgive delinquent taxes and liens on properties so that nonprofit, community-based organizations can buy the properties and create affordable housing or employment centers. In addition to these and other locally initiated programs, Atlanta participates in many programs sponsored by the federal government that are used to promote economic growth and revitalization within the city (City of Atlanta 2004).

The City of Atlanta has also adopted programs with multiple goals that include urban revitalization, increased population density, and greater access to affordable housing. One of these is Atlanta's Livable Centers Initiative (LCI). According to Atlanta's Comprehensive Development Plan (2004), Livable Centers are one way that the city incorporates the principles of New Urbanism into its planning. "'New Urbanism' reflects the public's desire to live in neighborhoods that offer a wide range of services and activities in small-scale mixed-use environments that provide a sense of intimacy as well as convenience" (quoted. p. 20-19).

The city has designated seven areas as Livable Centers. Each is located near an existing or proposed Metropolitan Atlanta Rapid Transit Authority, or MARTA, station. The objective is to encourage high-density, pedestrian friendly development in these areas that includes a range of affordable housing options as well as various services. The city provides planning and capital funding, including transportation improvement funds, to encourage growth in these areas (City of Atlanta 2004).

The City of Atlanta has adopted numerous measures to achieve the smart growth objectives of reducing automobile traffic and encouraging the use of other means of transportation. In order to reduce traffic congestion, the city has made or planned for improvements to the interstate/highway system that include the installation of high occupancy vehicle (HOV) lanes, freeway message signs, aerial surveillance systems, and "HERO" incident response vehicles (Chapman 2000). The city also has gradually expanded MARTA services to alleviate heavy traffic. Currently, Atlanta's MARTA system has 46 miles of rapid rail service utilized by 238 train cars, and 1,500 miles of bus service utilized by 778 city buses (City of Atlanta 2004).

As in Baltimore, air quality is a major concern for planning officials in Atlanta because of the city's designation as a "nonattainment" area for safe ozone levels by the EPA (2000). The City of Atlanta participates in Georgia's State Implementation Plan (SIP) for attaining Federal Clean Air Act standards. In accordance with the SIP, air quality control in Atlanta is necessarily entwined with reduction of automobile traffic and reestablishment of some healthy tree canopy within the city. In addition to those measures to alleviate traffic congestion described above, the city has also implemented an ordinance that limits the amount of time any vehicle may idle to fifteen minutes consecutively (City of Atlanta 2004).

Encouraging bicycling as a means of transportation is another initiative adopted in part to reduce auto emissions. In 1991 the city began a "greenway trails" plan to provide citizens with a number of bike trails connecting schools, businesses, and shopping centers. The city's Commuter On-Street Bike Plan, developed in 1995, is designed to allow bicyclists safe use of roadways. Under the plan, the city has created bike lanes and wide curb lanes on some streets. The city has also sought to insure secure parking for bikes in urban areas by installing hundreds of bike racks throughout the city. According to the city's website, these programs need greater publicizing throughout the city, as less than 1% of residents currently ride bikes to school or work (City of Atlanta 2004).

The City of Atlanta has little to show in terms of programs for its determination to improve air quality by increasing plant life in urban areas. There is a Tree Ordinance in place that is designed to encourage the placement of new trees within the city and limit which existing trees may be removed. The city's Comprehensive Development Plan makes it clear, however, that more resources are needed to fully implement and enforce the ordinance. The city also lists as goals the development of an "urban forest management plan" to include planting, maintenance, and protection of trees, and an expansion of the Bureau of Parks Forestry Division staff to implement that plan (City of Atlanta 2004).

Finally, in regard to affordable, desirable housing, the City of Atlanta operates a variety of programs (in addition to the Livable Centers Initiative described above). The Atlanta Housing Authority (AHA) administers most of the major programs that provide housing to low-income families. Since the year 1995, AHA has reinvented itself, and transformed from an ineffective, poorly run organization to a "leader in affordable housing development and management" (City of Atlanta 2004, quoted p. 7-6). One of the primary means through which this has been accomplished has been the implementation of the successful Olympic Legacy Program. Through this program, the city demolishes the most severely distressed public housing projects and replaces them with high quality mixed-income, mixed-use communities. The objective of Olympic Legacy is to de-concentrate poverty by allowing families with a broad range of incomes to live in the same neighborhoods (City of Atlanta 2004).

Clearly the City of Atlanta has enacted many programs that may be classified as "smart" in nature, or having the potential to benefit the economy, community, and the environment. Many of these programs have been implemented in order to address the wide range of critical growth issues outlined in the previous section. I will now examine the unique characteristics and smart growth programs of the City of Orlando.

Orlando, FL

People are drawn to Orlando for the warm weather, numerous amusement parks, and proximity to beaches on both the Gulf and Atlantic Coast. The city's population explosion has created some obstacles to healthy growth, however (City of Orlando 2004). In this section, I will examine these obstacles and the local programs implemented to overcome them.

Long-term Challenges

The social and economic development of Orlando contrasts with some aspects of the development of both Baltimore and Atlanta. Orlando is not an "old" industrial city as is Baltimore. Orlando was incorporated as a city in 1875, almost 100 years after the establishment of the City of Baltimore (City of Orlando 2004). Furthermore, Orlando was historically a citrus farming/cattle-raising city, rather than a major industrial hub as Baltimore was. The population of Orlando did surge in the mid-twentieth century and has continued to increase since. In the 1940s, military personnel increased the city's population when two air bases were established there. In the next decade, the population continued to expand as the agriculture economy in Orlando began to diversify and include a technological base. The impetus behind this development was the relocation of the Glenn L. Martin Company to the city. The company, now known as Lockheed Martin, continues to produce aircraft and defense technology in Orlando. Orlando assumed another boom in population when it became a major tourist destination in 1971 with the opening of Walt Disney World (City of Orlando 2004, Jelic 2003).

The geography of Orlando has resulted in some of the major differences between the city and the City of Atlanta. As described above, Atlanta gradually became a major transportation crossroads due to its location. Orlando, on the other hand, is situated about 1/3 of the way down the Florida peninsula. The development of the city was largely dictated by the fact that the peninsula is surrounded by ocean on three sides. This left Orlando in an out-of-the-way location in terms of commercial traffic flow across the Southern US (City of Orlando 2004). I will discuss later in this chapter how the geography of Orlando also gives the city an advantage over Baltimore and Atlanta in terms of maintaining air quality.

Orlando's position as a tourist-Mecca further distinguishes it from Baltimore and Atlanta. Since the opening of Disney's Magic Kingdom, a handful of other major theme parks have opened in the Orlando area. These include Epcot, MGM Studios, Animal Kingdom, Sea World, and Universal Studios. Along with these parks, an array of hotels, restaurants, and other tourist venues have proliferated in and around the city. With an economy largely based on tourism, Orlando has unique planning and land use concerns (City of Orlando 2004).

One unique consequence of Orlando's tourism economy is that average wages in the area are relatively low because many residents are employed in hourly wage positions at amusement parks. In fact, Walt Disney World is the largest private employer in the city. Because average incomes are low, access to affordable housing is of particular concern to planners and other city officials. A second result of the tourism economy is that significant strain is put on the city's infrastructure. Tourists, who are largely non-residents, utilize the city's roads, water, and sewage systems, yet they do not pay property taxes toward the maintenance of these systems. The third and final point that is of particular concern to the health and sensible growth of Orlando is severe traffic congestion. Congested roadways are associated with sprawl, but exacerbated in this case by the number of tourists in the area (City of Orlando 2004, Jelic 2003).

Local Smart Growth Initiatives

Both the City of Orlando's web site and Growth Management Plan make frequent mention of the city's implementation of smart growth practices (City of Orlando 2004). The following quote from the vision statement in the city's GMP reflects the basic values and goals of smart growth programs:

> *"This plan establishes an agenda for Orlando that is founded on preserving Orlando's natural and man-made environments, promoting community development, neighborhood preservation, reducing urban sprawl, promoting the efficient use of transportation and financial resources, and nurturing its most important asset - its people."*

The City of Orlando has adopted programs in regard to all five of the smart growth objectives addressed in this research: revitalization of central cities, control of development, creation and improvement of transportation options, protection of natural resources, and creation of equitable, desirable neighborhoods (City of Orlando 2004).

The city of Orlando utilizes the principles of New Urbanism within the city to revitalize downtown areas and encourage infill development. Thornton Park and Baldwin Park are upscale, mixed use communities in urban Orlando. The cost of living in these neighborhoods is high, largely because of the great demand they have generated.

There are also a limited number of affordable housing projects in the metropolitan area that are of New Urbanism design. One of these is the Hampton Park community. In addition, the city provides incentives for commercial development downtown to utilize the principles of New Urbanism. For example, a 30% reduction in transportation impact fees is available for development that includes mixed uses and buildings that face the street (City of Orlando 2004).

Orlando also offers a variety of programs designed to encourage businesses to locate within the city, thereby stimulating the economy, creating jobs, and promoting infill development. The Job Creation Incentive Program provides grants to qualifying companies to assist with the costs of relocation or expansion. The city also provides financial assistance to businesses for physical improvements through the Infrastructure and Site Improvement Program and the Business Assistance Program (City of Orlando 2004).

The Transportation Concurrency Exception Area program is another important tool the City of Orlando uses to promote infill development and increase population density. As discussed in Chapters II and III, the State of Florida has stringent "concurrency" requirements for new development. This means that certain utilities and services, including transportation facilities, must be in place (or, at least promised to be in place) before permits will be issued. In Orlando, TCEA is used to encourage infill development, regardless of whether transportation infrastructure is in place (City of Orlando 2004).

Orlando also has a historic places preservation program that is credited with preserving and maintaining more than 35 historic landmarks within the city. This program has not only helped to preserve the unique character of Orlando, but it has also helped the inner city to remain vital. The city has repeatedly refused offers to redevelop historic areas with commercial space (City of Orlando 2004).

Orlando's Neighborhood Horizons initiative has allowed citizens to provide input into some aspects of the planning process, including central city revitalization. Through Neighborhood Horizons, city officials meet with residents of various communities in order to develop a consensus regarding avenues for growth and improvement of the communities. Planners then develop criteria to periodically assess the progress made within the community. The program is available to all 88 neighborhoods within the city (City of Orlando 2004).

Orlando's Growth Management Plan (City of Orlando 2004) indicates the city's commitment to alternative forms of transportation in order to decrease traffic congestion and maintain air quality. The transportation philosophy for the city is exemplified in plans for the development of a 19,300-acre area called the Southeast Sector:

> *"Pedestrian and bicycle access will be provided between neighborhoods and communities, and between all of the developments in the Southeast Plan area... Neighborhood streets of varying types will be designed to provide for pedestrian comfort and safety, and for efficient automobile movement. Slowing the automobile and increasing pedestrian activity encourages the casual meetings that form the bonds of community... "*

Once again, the principles of both smart growth and New Urbanism are evident.

The city of Orlando also encourages residents and visitors to use mass transit. The city utilizes the services of Lynx bus lines, which also services all of Orange County, plus Osceola and Seminole counties. Lynx has 208 buses currently in service. According to the City of Orlando's website, from 1992 to 2003, the number of bus passengers doubled to more than 19 million people annually. In addition, the city provides free bus service along a three-mile loop in the downtown area. The "Lymmo" service includes ten buses that carry about 4,000 passengers a week (City of Orlando 2004).

In terms of air quality, it is important to note that Orlando has not been designated a "nonattainment" area for air quality standards by the EPA, as both Baltimore and Atlanta have been (EPA "National" 2000). This is largely due to the city's location on the Florida peninsula. The entire peninsula benefits from the steady sea breeze that originates over the Gulf of Mexico and pushes air eastward toward the Atlantic Ocean. In Orlando, concentrations of air pollutants may be diminished or relocated by the incoming winds. Another advantage Orlando has over Baltimore and Atlanta is that it does not receive downwinds of potentially polluted air from northern manufacturing states, such as Michigan. The combination of its extreme southerly location and the Gulf sea breeze serve to (at least partially) maintain air quality in Orlando (EPA "National" 2000).

Nevertheless, the City of Orlando has a number of policies designed to maintain or improve air quality. A primary strategy is the regional planning that the city does with the Metropolitan Planning Organization, which includes the four counties that make up the Orlando metropolitan area. The city and the metropolitan organization work together with regard to interjurisdictional environmental, transportation, and economic planning. The City of Orlando also has policies in place to reduce auto emissions. Various mass transit systems are in operation, including bus and rail service described above. The city also has programs similar to those in Atlanta designed to encourage individuals to carpool or ride bicycles as alternatives to driving alone to work or school. Finally, the city has ordinances in place to restrict open burning, which is known to produce carbon monoxide and particulate matter, in particular (City of Orlando 2004).

Many programs designed to increase housing affordability and quality are available to residents of Orlando. The Downpayment Assistance Program helps low to moderate income first time homebuyers purchase homes within the city limits. The total funding available per home ranges from \$5,000 to \$14,999, depending on income. In order to qualify, potential recipients of funds must agree to live in the home for a minimum of five years. The city also offers a Foreclosure Prevention Strategy for those homeowners who received financial assistance from the city for the purchase of their home. Individuals who obtain help with mortgage payments are required by the city to attend credit counseling classes (City of Orlando 2004).

Homeowners in Orlando may also benefit from a variety of housing rehabilitation assistance programs. Low income homeowners may receive up to \$5,000 to repair "life threatening" conditions on their property through the Emergency Repair Program. Qualifying conditions include severe roof leaks and serious electrical problems. In a similar program, Housing Code Assistance, low-income homeowners may receive money from the city to correct code violations. Examples of violations include peeling paint and decrepit porches (City of Orlando 2004).

In order to increase the amount of affordable, quality rental units, the City of Orlando operates a Rental Rehabilitation Program. Investors or owners of rental property may be eligible for low interest or deferred loans toward the cost of rehabilitating housing for low-income residents. Upon completion of improvements, the city places limits on the amount of rent that owners may collect from tenants (City of Orlando 2004).

In summary, the City of Orlando has implemented many smart growth programs designed to reverse the conditions associated with unhealthy growth, as have Baltimore and Atlanta. My next task is to determine which city has been most successful in terms of achieving the goals of smart growth. Later in this chapter I will analyze indicators of smart growth for Baltimore, Atlanta, and Orlando in order to determine if these programs, and the state level programs associated with them, have been effective.

Data Presentation and Interpretation

The remainder of Chapter IV will be devoted to presenting and interpreting data in order to evaluate the effectiveness of smart growth programs. Five sections will be developed based on the five objectives of smart growth outlined above. In each section, I will present data for indicators I have selected to gauge smart growth attainment of the respective objective. For example, in the first section, I will evaluate the three case cities in regard to achieving the revitalization of central cities. My means for doing so will be to compare the "health" of central cities versus suburbs for several dependent variables. The selected variables will be population growth, segregation, poverty, and crime.

For each indicator, I will review data for Baltimore, MD then Atlanta, GA then Orlando, FL. I will proceed in this manner for a couple of reasons. One is that establishing an order and following it lessens confusion and requires less effort on the part of the reader. A second reason is that when the three cities are in the order specified, they are arrayed from least coercive to most coercive in terms of state smart growth planning intervention according to my classification system. Keeping the level of coercion in mind will enhance the evaluation phase of this research.

Objective #1: Revitalize Central Cities

Urban sprawl often leaves inner cities in a state of decline while suburbs prosper (Mitchell 2001). A central tenet of smart growth reform is to revitalize cities so that those who live or work in the city can enjoy the same quality of life as those who live or work in the suburbs. Additionally, programs seek to keep individuals from moving away from cities (Freilich 1999, Weitz 1999). In this section I will compare population growth, segregation trends, and incidence of poverty for both city and suburbs of Baltimore, Atlanta, and Orlando. All of the data used was obtained from the Bureau of Census website.

It is important to evaluate the effects of state smart growth legislation on population growth patterns, segregation trends, and incidence of poverty because such legislative programs are *inherently meant to affect these variables.* Smart growth policies are aimed to: (1) prevent inner-city population from declining while suburban population increases; (2) reduce segregation in the city particularly and also in the suburbs; and (3) reduce poverty in the city particularly and also in the suburbs (Anderson and Tregoning 1998, Beaumont 1999).

Some individuals argue that it is unrealistic to assume that smart growth programs can positively impact these variables, and that therefore examining these variables will not reveal any useful information about the effectiveness of smart growth laws. Their argument is that social pathologies such as population attrition, segregation, and poverty are caused by a host of factors ranging from cultural norms to median level of education, and that any legitimate attempt to reverse these would have to be complex, with numerous avenues of "attack" (Gordon and Richardson 1998, Holcombe and Stanley 2001, Staley "Markets" 2001). My response to such a challenge is that that is exactly what smart growth policy is meant to be, a multi-pronged weapon of attack against a multitude of ills that are related to or exacerbated by urban sprawl. I provided numerous examples of how this might work earlier in this chapter, as I discussed city-level initiatives. For instance, a smart growth policy that provides businesses with financial incentives to relocate in an inner city might have many primary and secondary effects. If individuals who live in the city obtain jobs as a result, poverty may be lessened. If relocation of the business stimulates activity and further development downtown, the standard of living may rise and segregation may be lessened as a variety of populations are attracted to the area. Further, if the area consequently becomes active and a demand for housing is created, that may impact segregation.

It is important to investigate changes in these variables in relation to introduction of smart growth laws in part because the laws are expressly designed to have an impact in these areas. In addition, as I have mentioned earlier in Chapter IV, it would be unwise in any case to attribute, say, a decrease in segregation, to any single cause (such as smart growth). Within this study I mean only to examine a wide variety of intended targets of smart growth legislation, then to draw preliminary and cautious conclusions from those. In short, the dialogue regarding the effectiveness of smart growth laws must begin at some place, even if the place is imperfect.

Population Growth

Figures A-9, A-10, and A-11 demonstrate the drastic difference in population trends between inner city and suburbs for each of the three metropolitan areas (Bureau of Census "State" 2004). In each instance, population in the suburbs has steadily increased over time. What varies between the three cities is the trend in central city population. I must remind the reader at this point that smart growth is not "no growth" or "slow growth". There is nothing inherently antithetical to smart growth goals about population increasing in the suburbs of a metropolitan statistical area (MSA) (Freilich 1999). What is undesirable according to smart growth theory, and what is generally associated with urban sprawl, is for *suburban population to grow while inner city population declines.* A successful smart growth initiative prevents the inner city from losing population, or at least keeps totals constant (Porter 1997 and 1998).

The extent of inner city deterioration in both Baltimore and Atlanta is demonstrated by their designations as Renewal Communities by the Department of Housing and Urban Development (HUD) (Department 2004). The Renewal Communities program was created in 2000 as part of the federal government's Community Renewal Tax Relief Act. The program allowed for 40 distressed cities to be designated as Renewal Communities. The cities then became eligible for regulatory relief and tax breaks that are designed to stimulate job growth, promote economic development, and create affordable housing (Department 2004).

Figure A-9 shows that Baltimore is a textbook example of abandonment of the central city (Bureau of Census "State" 2004). The line indicating population growth in the suburbs is in stark contrast to the line indicating population decline in the central city.

Population in the City of Baltimore fell from 905,759 people in 1970 to 651,154 people in 2000. Over the same time period, total population in the suburbs increased from 1,153,741 people in 1970 to 1,866,002 people in 2000. Based on the (admittedly limited) census data presented here, Maryland's smart growth legislation, passed in 1992 and 1997, was not able to stop the population flight from the city as of the year 2000. While there is only one data point available after legislation was enacted (for year 2000) the continuation of the trend line is evident.

The trend in central city population for Atlanta is more desirable in terms of smart growth (Bureau of Census "State" 2004). Figure A-10 shows that in Atlanta, central city population was decreasing each decade until some time after the year 1990. From 1990 to 2000 the central city experienced an increase of 22,457 people. Since Georgia's smart growth legislation was enacted in 1989, immediately prior to the increase, it may have been responsible for some degree of that change. This is an encouraging finding in terms of smart growth achievement. Even so, the central city population total for 2000 is lower than what was recorded in 1980. Further, to return to 1970 population totals, over 80,000 additional individuals would need to move to the city.

The overall population trend in Orlando's central city has been "healthier" than what was seen in both Baltimore and Atlanta (Bureau of Census "State" 2004). Data for Orlando show a continuous, if somewhat uneven, increase in population totals for the central city (see Figure A-11). In fact, population rose from 98,965 people in 1970 to 185,951 people in 2000. Most importantly, after 1985, when smart growth legislation was implemented, urban population continued to climb. While this may be due to Florida's legislation, and it is in accord with the goals of smart growth policy, it may also be a continuation of the trend line, which clearly showed an increasing population from 1970 onward. In short, the trend in population described is desirable, but may not be attributable to Florida's smart growth legislation.

Segregation Trends

The second indicator for central city revitalization that will be examined is the trend in segregation for central cities versus suburbs. As discussed previously, one typical consequence of urban sprawl is that wealthier, usually white individuals leave the city to live in the suburbs, where the standard of living is higher. Those left behind in the decaying city are those who cannot afford to move. They are often black, or other minorities, and generally less stable financially. A successful smart growth program would reverse this trend, or at least keep racial population differences the same within the city and suburbs (Freilich 1999, Porter 1998, Weitz 1999).

Tables A-1 through A-3 and Figures A-12 through A-21 provide a detailed account of how the racial make-up of each city is split between urban and suburban areas, and how that make-up has changed from 1980 to 2000 (Bureau of Census "State" 2004). Due to the volume of information presented, I will divide this section by city, into a total of three parts.

Baltimore

Table A-1 shows what percentage of total population each race has comprised in both the central city and suburbs of Baltimore for 1980, 1990, and 2000 (Bureau of Census "State" 2004). Within the city, the white population has diminished over time in terms of percent of total population. It decreased from 44% of the total in 1980 to 31% of the total in 2000. In its place, black population gained as a proportion of total central city population. Blacks increased from 54% of total population in 1980 to 64% in 2000.

In the suburbs of Baltimore the patterns of change were similar (Bureau of Census "State" 2004). The proportion of whites decreased as the proportion of blacks increased. White population fell from being 89% of the total to 79% of the total. Blacks, in turn, increased from 8% of the total suburban population to 14%. Hispanics and "other" races continuously held a few percentage points of total population in the suburbs as well as the central city.

Figures A-12 and A-13 show that white and black population trends in Baltimore were generally similar to one another over time, although there was tremendous difference in the actual population numbers (Bureau of Census "State" 2004). Both races generally lost population in the central city and both generally gained population in the suburbs. The loss for the white population total in the central city was more pronounced from 1980 to 2000. While the white population decreased by 141,762 members, the black population decreased by only 10,653 in the city.

Finally, Figure A-14 shows that while the population of both races grew in the suburbs of Baltimore from 1980 to 2000, white population totals were consistently over 1 million people more than black population totals (Bureau of Census "State" 2004).

This collection of evidence points to a conclusion with mixed results for Baltimore in terms of smart growth achievement with segregation trends. As I determined at the beginning of the section "Objective #1", the segregation data shows that Baltimore is a classic case of inner-city abandonment, that I can now state has been abandoned *by both white and black populations.* In terms of total population, including both races, it is an undesirable finding that both populations have lost members in the "flight" from the cities. In regard to evaluating segregation, it is notable that blacks continued to be less likely to leave the urban area than whites, as their rate of decrease was significantly slower, and did not begin until 1990. This disparity is likely indicative of economic inequalities between the races. In other words, blacks were less likely to leave because they largely could not afford to leave. Still, it may be a positive finding in terms of smart growth that blacks were more able to leave the city if they wished during the decade Maryland's smart growth legislation was enacted.

A cautionary note here is that for the white population in the central city, some degree of the downward trend may be a continuation of the trend line. Maryland did not implement smart growth legislation until 1992 and 1997. During the decade of program implementation, the decrease in white numbers continued, as it had during the previous decade.

On the other hand, it is a positive finding in terms of smart growth that numbers of blacks in Baltimore's suburbs have continued to grow. The growth line was remarkably steeper after 1990, during the decade of smart growth implementation.

Atlanta

Table A-2 shows trends in segregation for the Atlanta MSA, divided between central city and suburbs (Bureau of Census "State" 2004). Unlike the trends shown for Baltimore, the make-up of Atlanta's central city population has changed very little over the 20-year period. The African American population has remained between 61% and

66%, while white population has stayed between 30% and 32% of the total. However, there were two noteworthy trends. One is that blacks lost 6% of their population from 1990 to 2000, and the Hispanic population increased from 1% in 1980 to 5% in 2000.

Population patterns in the suburbs were more dramatic (Bureau of Census "State" 2004). The overall trend was a decrease in the dominance of white population totals that existed in 1980 while there was a simultaneous increase in black population totals. White population fell from 84% of total suburban population in 1980 to 63% of the total in 2000. The corresponding increase in black population make-up rose from 14% in 1980 to 25% in 2000. Hispanic percents also increased from 1% of suburban total population in 1980 to 7% in 2000.

Figures A-15 and A-16 provide further insight into the trends described above in terms of population totals rather than percentages (Bureau of Census "State" 2004). In Figure A-15, white population is shown to remain fairly steady over time in the central city, while increasing in the suburbs. *It is remarkable that while white population in Atlanta's suburbs increased over the 20-year period, white population as a percent of total population decreased at the same time.* Figure A-16 shows how this occurred. The black population in Atlanta's suburbs skyrocketed over the 20 years, particularly from 1990 to 2000. The rate of that growth was substantial enough to change the percent divisions between the races.

Finally, Figure A-17 shows a comparison between white and black population growth over time in suburban Atlanta (Bureau of Census "State" 2004). While both populations increased, the white population total continued to be greater than the black total.

The totality of evidence presented suggests desirable changes in segregation trends for Atlanta MSA in terms of smart growth objectives. One finding is that *conditions did not worsen over time in the central city.* The ratio of races remained essentially the same over time. In fact, conditions somewhat improved for blacks as they lost 5% of the total central city population in their flight to the suburbs. A second finding is that *blacks have not been excluded from occupying the suburbs of Atlanta.* While pockets of segregation in the suburbs certainly continue to exist, overall the rate of black population growth has surpassed the rate of white population growth. In other words, if whites and blacks live in separate suburban neighborhoods, it is not because there are no blacks in the suburbs.

Georgia's smart growth legislation, enacted in 1989, may be responsible for some of these changes. While these trends were evident prior to 1989, they became more evident after 1989. For example, black population growth in the suburbs grew more quickly after 1989 than it did prior to that year.

Orlando

The history of segregation trends in Orlando MSA has evolved very differently than trends seen in Atlanta MSA (Bureau of Census "State" 2004). Table A-3 shows the differences in population make-up between Orlando's central city and suburbs over a 20-year period. In the central city, white population as a percent of total population fell from 65% in 1980 to 50% in 2000. Black population as a percent of total population also fell, from 30% in 1980 to 26% in 2000. These trends were largely a result of the booming Hispanic population that became established in the city. The population of Hispanics in the city grew from 4% of the total to 18% of the total population over the 20-year period. (I did not discuss Hispanic population trends for Atlanta because they were a much less significant part of the whole.)

Some similar trends developed in Orlando's suburbs (Bureau of Census "State" 2004). The white population decreased as a percent of the total, from 86% in 1980 to 67% in 2000. The Hispanic portion of the population in the suburbs increased from 3% of the total in 1980 to 16% of the total in 2000. In contrast to central city trends, the black population remained relatively constant, staying between 9% and 12% of the total suburban population over time.

Figures A-18, A-19, and A-20 show white, black, and Hispanic populations respectively as they have changed over time in Orlando (Bureau of Census "State" 2004). It is clear from these three charts that growth in black and Hispanic populations has increased at a faster rate than that of the white population for the entire MSA, and particularly in the suburbs. The white segment of the population was the only segment to show a decrease in population in the central city. The number of white residents in the central city fell from 103,740 in 1990 to 94,452 in 2000.

Patterns of growth were similar between Orlando's black and Hispanic populations, although the actual population totals were disparate, as the figures indicate (Bureau of Census "State" 2004). Black and Hispanic populations increased in the city and suburbs over time. Furthermore, both populations exhibited a jump in the rate of suburban population growth from 1990 to 2000.

Figure A-21 compares suburban population growth for each of the three populations (Bureau of Census "State" 2004). Despite the overall decrease in proportion of total population for the white segment, the total of white individuals continued to significantly outnumber both black and Hispanic populations. It is also evident from the graph that the Hispanic population grew at a faster rate than the black population did, especially from 1990 to 2000.

In terms of achieving smart growth goals, results for Orlando are mixed, yet promising. After 1985, the year of Florida's program inception, the white population was the only population to lose members in the central city. In fact, white population increased from 84,055 in 1980 to 103,740 in 1990 before it fell to 94,452 in 2000. Some degree of increased segregation is evident because as whites were moving out of the city, blacks and Hispanics were moving into the city. On the other hand, after 1985 both black and Hispanic populations experienced tremendous jumps in their suburban totals. This is a positive finding because it shows increased accessibility to suburban homes for both minority groups.

Poverty Trends

Another method of gauging the health of the central city in relation to nearby suburbs is to compare poverty trends between the two. Smart growth programs seek to lessen poverty, particularly in the urban core, where it is usually greatest. Methods of decreasing the incidence of poverty in the city include offering businesses financial incentives for relocating downtown and offering families incentives for buying homes in the urban area. The intended result of these programs is to provide the central city with economic stimulation, so that eventually jobs will return to an area, thus relieving some degree of poverty (Freilich 1999, Porter 1998, Weitz 1999).

Figures A-22, A-23, and A-24 illustrate the difference in poverty trends between central city and suburbs for Baltimore, Atlanta, and Orlando, respectively (Bureau of Census "State" 2004). The data used to generate these charts was obtained from the State of the Cities data set produced by the US Census Bureau. The definition of poverty used here is the Census Bureau's definition of poverty. In order to determine whether a household qualifies as "living in poverty", the Census Bureau considers the number of people in the household and their ages. Based on that number, the household is assigned into one of 48 "poverty threshold" classifications. If the total income of the household falls below the poverty threshold number, that household is considered to be in poverty. (The determination of poverty is complex, and I refer the reader to the following web address for more information: http://www.census.gov/hhes/poverty/povdef.html)

The graph for Baltimore (see Figure A-22) shows tremendously higher poverty levels in the central city as compared with the suburbs over time (Bureau of Census "State" 2004). While suburban poverty hovered around 5% each year, central city poverty rose from 18% in 1969 to 22.9% in 1979 and 1999. I am interested in the changes in the figures from 1989 to 1999 because Maryland's smart growth program was enacted in 1992 and 1997. Based on a comparison of those two years, the state's smart growth program appears to have possibly had the undesirable effect of increasing poverty rates in the city and suburbs. From 1989 to 1999, poverty grew in Baltimore's central city from 21.9% to 22.9%. Poverty in the suburbs grew from 4.7% to 5.2% during that same time. Furthermore, this finding is reinforced when the 1979 data is taken into account. Poverty had decreased from 1979 to 1989 in both urban and suburban areas of Baltimore.

Figure A-23 shows that as was the case in Baltimore, Atlanta exhibited a significantly higher incidence of poverty over time in the central city as compared with the suburbs (Bureau of Census "State" 2004). Poverty in the city of Atlanta increased from 1969 to 1979, and then began to gradually fall after 1979. In the suburbs, there was a decrease in poverty rate each year until 1999, when it increased by a tiny .2%.

For Atlanta MSA, I am interested in comparing the trends both before and after 1989, the year Georgia implemented smart growth legislation. The results of this analysis are basically *positive in terms of smart growth objectives.* After 1989, poverty in the central city decreased from 27.3% to 24.4%. It should be noted, however, that there was a less significant decrease in poverty (-.2%) from 1979 to 1989. If the changes seen in central city Atlanta's poverty rate were a continuation of the trend from 1979, then that trend changed dramatically after 1989. It is more likely that Georgia's legislation began to produce desirable changes after 1989.

As I mentioned above, poverty in Atlanta's suburbs increased by a fraction of a percentage point from 1989 to 1999. While a continuation of the downward trend in the incidence of poverty in the suburbs as shown in Figure A-23 would have been desirable, in light of the tremendous population increase in the suburbs of Atlanta over this time, a near-stabilization of the trend is probably a positive finding.

The trends for poverty rate in Orlando are shown in Figure A-24 (Bureau of Census "State" 2004). It is clear that Orlando has experienced an overall lesser degree of disparity between conditions in the city and in the suburbs than have both Baltimore and Atlanta. However, poverty in the city of Orlando was consistently about 5% higher than in the suburbs. As for the effects of Florida's smart growth legislation passed in 1985, it appears to have had a slightly *undesirable* impact on poverty rates. The poverty trend for both city and suburbs was decreasing from 1969 to 1989. Figure A-24 shows that city poverty levels fell from 19.5% in 1969 to 15.8% in 1989. For those same years, poverty fell in the suburbs as well, from 14.7% to 9.3%.

After smart growth legislation was enacted in 1985, however, the rate of poverty in both city and suburbs slightly increased. It rose .1% in the city and .7% in the suburbs. These figures appear to be negligible when viewed without the data for previous years. In light of the preceding decrease in poverty rates for both city and suburbs, I will conclude that the 1985 law had an undesirable impact for this measure.

Summary Conclusions

In Chapter V, I will present a detailed conclusion regarding the analysis of each dependent variable. Here, and at the end of each data presentation section throughout the remainder of Chapter IV, I will provide a brief summary conclusion of findings.

Somewhat surprisingly, Atlanta yielded results most in accord with smart growth when quality of life variables were compared between central cities and suburbs for each of the metropolitan areas. Atlanta had desirable findings for population trends, segregation and poverty measures. While the city did lose population in its urban core over time, the trend appears to have begun a reversal after state smart growth implementation. Orlando demonstrated a growing urban population, a finding that is clearly desirable in terms of smart growth. On the other hand, Orlando had mixed results for segregation and poor findings in terms of poverty. Baltimore, unfortunately, showed a continuous loss of population in the city, increased poverty, and mixed results for the segregation variable.

Objective #2: Control Development

The second smart growth objective I will examine is limitation of undesirable development. Smart growth initiatives generally seek to increase population density, or the number of people per unit of land, by encouraging infill development so that while the total population of a city grows, the land area of the city will not increase disproportionately (Mitchell 2001). Smart growth programs are designed to control growth either through coercion, such as growth boundaries and restriction of capital improvement funds, or through incentives, such as providing businesses with tax breaks to encourage them to locate within an inner city, or through some combination of both (Danielson and Lang 1998). In order to evaluate the effectiveness of this aspect of smart growth legislation in Baltimore, Atlanta, Orlando, I will analyze and interpret trends in the expansion of each city's total land area in relation to population growth.

The Census Bureau data I will utilize in this section is for *urbanized areas*. In other sections of Chapter IV, I utilize Census data for *metropolitan statistical areas*, or MSAs. Urbanized area data is more appropriate here, for an evaluation of population density and sprawl, because it includes a more limited land area than MSA data. According to the Census Bureau ("Summary" 2004), urbanized areas contain an urban core (or, inner city) and contiguous development that has a population density of at least 1,000 people per square mile. Development must be continuous outward from the inner city and no rural areas are included. Metropolitan statistical areas, on the other hand, contain the urban core and "adjacent communities having a high degree of social and economic integration with that core". MSAs include the entire land area of each county that contains part of the city or its suburbs. Rural land is included because there is no population density restriction for including suburbs and because parts of some counties may be rural. MSA data is most useful for comparing conditions in city and suburbs. Urbanized areas data makes no distinction between central city and suburbs (Bureau of Census "Summary" 2004).

Population Density

Population density refers to the number of people per unit of land in a city. It is calculated by dividing population by land area. Population density is the inverse of per capita land consumption, which is the amount of land each person in a city occupies in theory. Per capita land consumption is found by dividing total land area by total number of people (Bureau of Census "Summary" 2004). These two measures essentially provide the same information, so only population density will be examined here.

According to the goals of smart growth programs, it is undesirable for the population of a city to be increasing while population density is decreasing ("Sprawl Guide" 2000). Such a condition indicates that land is being consumed at a faster rate than population is growing ("Per Capita" 1990). However, it is also undesirable for density to increase indefinitely. Indeed, at some undefined point a high concentration of people in an area creates problems such as crowded housing conditions and increased pollution (Danielson and Lang 1998).

As stated above, the Census Bureau considers a population density of less than 1,000 people per square mile to be rural (Bureau of Census "Summary" 2004). While this designation perhaps oversimplifies a complex concept, it does provide a reference figure for examining population density.

Figure A-25 shows the changes in each city's population density over a 30-year period (Bureau of Census "Summary" 2004). Findings for Baltimore are most dramatic for this indicator. In 1970, population in Baltimore's urbanized area was at a density of 5,102.7 people per square mile. That figure plummeted to 3,041.3 people per square mile by 2000 (while total population increased). The good news in terms of smart growth is that during the decade smart growth legislation was enacted in Maryland, from 1990-2000, the rate of the decrease in population density slowed. The rate was a loss of 168.6 people per square mile from 1980 to 1990, and then slowed to a loss of 148.7 people per square mile the following decade. In other words, population density continued to follow the trend line, but with some modest improvement that could be attributable to program inception.

Atlanta also showed a net decrease in population density over the 30-year period (Bureau of Census "Summary" 2004). There was some improvement, or increase in density, from 1980 to 1990, but after smart growth implementation in 1989, population density fell once again. The city reached its lowest density for the 30-year period at 1,783.3 people per square mile in 2000. If smart growth legislation impacted population density in Atlanta, it appears to have had a slightly negative affect, particularly in light of the improvement seen in the decade before program inception.

Of the three cities, *Orlando was the only one to have urban population increasing while population density was also increasing overall* (Bureau of Census "Summary" 2004). The net increase in density was 234.5 people per square mile. The trend appears to be a victory for smart growth program efforts. The chart shows that population density did decrease somewhat from 1970 to 1980. After Florida's smart growth program was implemented in 1985, however, density increased.

Population v. Land Area

The second indicator I will present for the second smart growth objective of controlling development is a side-by-side comparison of population growth and land area growth. A successful smart growth initiative will limit land consumption by increasing density, even as population grows (Freilich 1999, Weitz 1999). Figures A-26, A-27, and A-28 show a comparison in the rate of change between population and land area for each of the three urbanized areas (Bureau of Census "Summary" 2004).

Figure A-26 illustrates that positive changes to growth patterns have taken place in Baltimore, although smart growth legislation may not have been the cause (Bureau of Census "Summary" 2004). From 1970 to 1980, the physical size of the city mushroomed by 68.8%, while population only grew by 11.1%. In the following two decades, the rate of growth in land area significantly slowed, to a 13.4% increase from 1980 to 1990 and a 15.2% increase thereafter. So, while improvement may be seen as early as the 1980s, Maryland did not pass smart growth laws until 1992 and 1997. Trends in Baltimore's land mass have been in accord with the goals of smart growth, but the legislation probably was not the cause of those trends.

The trends seen in Atlanta are quite different. Figure A-27 shows that while in the first decade of analysis growth in land area surpassed population growth, during the second decade, population growth was the greater of the two, followed by a return to the original relationship in the third decade (Bureau of Census "Summary" 2004). The greatest discrepancy between population and area growth occurred from 1970 to 1980. During that decade, population increased 37.1%, while land area increased by a whopping 107.8%. From 1980 to 1990, population growth exceeded land area growth by only 8.1%. After statewide smart growth program implementation in 1989, land area was once again greater, although the difference between the two growth rates was less dramatic. Nevertheless, both grew by over 50% of 1990 levels in the final decade.

In terms of achieving smart growth in Atlanta, these results are mixed. After Georgia's legislation was adopted in 1989, land area growth exceeded population growth, which is generally undesirable. This is particularly a concern after the positive changes seen in the prior decade. On the other hand, I know from my evaluation of "Objective #1" that from 1990 to 2000 both the city and suburbs of Atlanta experienced significant population growth. Taking that into consideration, it may be true that Georgia's smart growth legislation kept the increase in land area from outpacing population growth at any higher rate.

Once again, Orlando shows changes most consistent with smart growth based on the data trends (see Figure A-28) (Bureau of Census "Summary" 2004). From 1980 to 2000, *population growth in urbanized Orlando outpaced land area growth*. While this is a desirable finding by itself, it becomes more so when considered with the information presented for years 1970 to 1980. Prior to 1985, the year the state of Florida enacted smart growth legislation, the overall trend was a faster rate of growth in Orlando's land area than in its population. Data for the next decade, 1980 to 1990, shows that at some point area growth slowed and was surpassed by the rate of growth in population. Based on this data, I cannot pinpoint the year the change took place, but the trend is clear and in line with smart growth goals. This finding may be a victory for Florida's smart growth program.

Summary Conclusions

In terms of controlling development by increasing population density, Orlando clearly had the best results. Orlando was the only city that had an increasing population density over time. The city managed to generally keep its growth in land area slower than its growth in population. Both Atlanta and Baltimore showed improvement for this indicator over time, but both consumed huge land areas in relation to population over all.

Objective #3: Create and Improve Transportation Options

In this section, I will consider aspects of each city's success or failure with the creation and improvement of transportation options. The analysis of transportation data is an important part of evaluating smart growth programs. As discussed in previous sections, transportation options and traffic conditions affect many aspects of life for citizens (Porter 1997, "Sprawl Guide" 2000). Transportation decisions made in a metropolitan area impact quality of life concerns, such as commute time, incidence of asthma attacks, and number of car crashes; environmental factors, such as air and noise pollution; and the pace of sprawl itself, when roads are "connected to everywhere" (Chapman 2000, quoted p. 69; Giuliano and Wachs 1993).

I have restricted this section to an examination of conditions associated with highway traffic. To this end, I will evaluate trends in highway congestion, traffic delay, and wasted fuel for Baltimore, Atlanta, and Orlando. There are several reasons for my focus on highway traffic. One is that the smart growth objective of creating and improving transportation options might include many features, so I was forced to limit the subject in order to make it manageable (Anderson and Tregoning 1998, Jeffords 2000). A second reason is that uniform traffic-related data measures were available for each of my three test cities (Texas 2001). Third, an examination of highway traffic congestion provides a variety of information. It shows some aspects of quality of life for residents of the cities, in terms of hours spent in traffic, for example (Anderson and Tregoning 1998, Jeffords 2000, Sierra "Sprawl" 2001). Indirectly it might also indicate whether residents of a city are using public transportation more or less over time. Earlier in this chapter I described how each of the three cities has encouraged use of public transportation. If I assume that there is a negative relationship between roadway congestion and use of public transportation (as one increases the other decreases), these figures may be telling in this regard. Finally, some of the information revealed here is also useful to my analysis of air quality in the next section. Smart growth theory makes the assumption that heavy automobile traffic is largely responsible for poor air quality in many cities (Godschalk 1992, Green 2001, Merriam 2003). In light of this relationship, it is almost impossible to study these two factors apart from one another. I will explore this topic further in the next section of Chapter IV.

Despite the useful attributes discussed above, analysis of highway traffic congestion as a measure of smart growth legislation effectiveness is not without criticism. The main criticism is that it is difficult to exclude rival explanatory factors in the analysis. In short, cities design smart growth programs to primarily affect the behavior and choices of residents, but both residents and nonresidents utilize roadways (Green 2001, Holcombe and Staley 2001). This means that it is difficult to attribute changes in traffic conditions solely to these programs. For example, each of the three test cities encourages residents to buy homes near public transit stations so that they may use their cars less as they use public transportation more. However, even if roadway congestion is shown to have decreased after many such homes were purchased, it may be in part due to the choices of tourists or commuters from surrounding areas rather than those homeowners, who are city residents.

In regard to the criticism described above, it provides a useful reminder that determining causality is not a simple task (Campbell and Stanley 1963). I have elected to use highway traffic data as part of my evaluation based on the three reasons provided above. At the same time, I am fully aware that the results of the data analysis must be considered in light of other variables, such as amount of tourist traffic and availability of subway service. Further, even when all of these factors are considered, the conclusions reached must be considered preliminary. As the programs mature and more studies are conducted, cumulative research results may gradually be compiled into more conclusive findings. In short, no single indicator is perfect for determining causality (Babbie 1998, Campbell and Stanley 1963).

Roadway Congestion Index

The Roadway Congestion Index (RCI) was developed by the Texas Transportation Institute (2001) to measure traffic density on major roadways in urban areas. An RCI exceeding 1.0 indicates an undesirable congestion level on freeways and principal arterial streets during peak traffic times. Figure A-29 shows a comparison of trends in traffic congestion, based on the Roadway Congestion Index, for Baltimore, Atlanta, and Orlando.

Each of the three cities came close to reaching an undesirable index of 1.0 in 1992 (Texas 2001). After 1992, traffic congestion in Atlanta basically continued to increase through the year 2000. In 2000, the Transportation Institute rated Atlanta at 1.32, indicating very heavy traffic on major highways at rush hour times. Neither Baltimore nor Orlando experienced an increase in RCI to the extent that Atlanta did after 1992. Baltimore generally had index values slightly higher than Orlando until 1998, when traffic density in the two cities began to grow at about the same rate. In the year 2000, Baltimore was rated as 1.1 and Orlando was 1.11. Of the three cities, Orlando's traffic density continued to be lowest over time. As the graph indicates, Orlando did not surpass the 1.0 threshold until after 1996. In the following paragraphs I will examine these trends in light of each respective state's date of smart growth legislation implementation.

The next three charts (Figures A-30 through A-32) show the Road Congestion Index for Baltimore, Atlanta, and Orlando each compared against the "average" RCI for cities of similar size (Texas 2001). The Texas Transportation Institute categorizes each of the three cities as "large urban areas", having populations over 1 million but less than 3 million at the time data was collected. Accordingly, I have graphed my three test cities individually with the average data for large urban areas in order to illustrate the differences.

Figure A-30 shows that the results for Baltimore are mixed in terms of smart growth achievement (Texas 2001). After 1992, the year of program implementation in Maryland, the Roadway Congestion Index leveled off for 1 year, remaining at .97 for 1993. While that finding is noteworthy, it becomes rather insignificant when the previous couple of data points are examined. In 1990 and 1991, Baltimore's RCI stayed constant at .95. The state's smart growth program may not have been responsible for the index reading in 1993. It may have been simply a continuation of the trend- one of a slow, modest increase.

On the other hand, beginning in 1997, the year of then-Governor Glendening's programs, Baltimore's congestion index began to gradually fall below the average (Texas 2001). This is an important observation because the timing coincides with smart growth legislation and also because Baltimore's index was historically above average.

Figure A-31 shows that Atlanta has consistently had a higher level of traffic congestion than what has been average for the same size cities (Texas 2001). This is not surprising given the city's reputation for highway and interstate gridlock. It is interesting to note, however, that the trend for Atlanta shown here is much closer to the average than what is observed for the following few traffic measures.

In terms of achieving smart growth goals, Figure A-31 does show some improvement after the legislation was enacted in 1989 (Texas 2001). While it is clear that roadway congestion in Atlanta did generally increase over the 18-year period, there was nearly a leveling off of the trend for at least the first 3 years. The RCI for the city was .98 in 1990, .97 in 1991, and .99 in 1992. After that year Atlanta's index surpassed the 1.0 threshold, but the yearly growth rate was uneven. It was not the steady climb exhibited in the average trend.

Figure A-32 provides some evidence that Florida's smart growth legislation did have an impact on roadway congestion in Orlando (Texas 2001). After the law's implementation in 1985, the RCI for Orlando nearly leveled off for a 10-year period. As shown in the chart, between 1985 and 1995, the index figure remained between .93 and .97. The other noteworthy point is that Orlando's RCI was above average until 1993, but after that year it remained below the average for same size cities for the remainder of the study. These two pieces of evidence suggest that Florida's smart growth legislation was effective to some degree.

Traffic Congestion Costs

The second measure of traffic congestion I will examine is annual traffic congestion cost trends, also based on research from the Texas Transportation Institute (2001). Data trends for congestion cost are presented graphically in Figures A-33 through A-36.

Figure A-33 illustrates the translation of total yearly nonproductive hours spent in traffic and the associated wasted fuel, into dollar amounts, in millions of dollars (Texas 2001). Although this measure is only available for three years; 1998, 1999, and 2000, it is useful to this research for a couple of reasons. One is that it shows the tremendous difference between Atlanta and the other two cities for this measure. It also provides a close look at the three most recent years available for this particular aspect of traffic congestion.

As is vividly shown in Figure A-33, congestion costs in Atlanta far exceeded costs in the other cities for these three years (Texas 2001). Baltimore dollar totals did steadily increase each year, but they were consistently less than ½ of costs in Atlanta. While there was a decrease of $100 million in Atlanta from 1998 to 1999, costs jumped to $1,885 million in 2000. Totals in Orlando for each of the years were barely above 1/3 of the congestion costs in Atlanta. Orlando, in fact, remained at $520 million for years 1998 and 1999, before increasing to $690 million in 2000.

Another manner of examining the financial costs of traffic congestion is considering the losses per capita, or according to population (Texas 2001). This is a valuable indicator for smart growth evaluation because rather than using raw dollar totals, as in Figure A-33, per capita cost figures standardize data by taking into account differences in population totals. Figures A-34, A-35, and A-36 show comparisons of each city's per capita costs versus what the average per capita costs have been for cities of about the same size. As with the previous measure of traffic costs in millions of dollars, the costs per person considered here are inclusive of annual hours spent in heavy traffic and associated fuel expenses (Texas 2001).

The average per capita costs for similarly sized cities, which are seen in each of the three figures, gradually increased by about $40 each of the three years (Texas 2001). For example, individuals in large cities lost, on average, about $344 in 1998 and $424 in 2000 due to time and gasoline wasted in traffic congestion.

In the case of Baltimore, per capita cost figures are reflective of congestion index data reviewed above (Texas 2001). While the trend in Baltimore was one of a gradual increase in cost due to traffic, from $315 per capita in 1998 to $395 per capita in 2000, Figure A-34 indicates that those totals were consistently below average for each of the three years- a positive finding. As I concluded in the previous section, data for 1998, 1999, and 2000 might be indicative of smart growth because per capita costs were kept below average. At the same time, that conclusion is tentative at best because costs were not held constant or reduced.

Figure A-35 shows that per capita congestion costs fluctuated in Atlanta during the 3-year period (Texas 2001). This is consistent with Atlanta's RCI for those years. While the decrease by $45 per capita in 1999 was an improvement, in the following year per capita costs increased by over $100. In addition, costs in Atlanta have consistently been $150-$200 higher than average. While I acknowledge that only a limited evaluation can be made based on Figure A-35, I do not observe any clear benefit from smart growth legislation. Rather, evidence of Atlanta's severe traffic conditions is reinforced.

The findings for per capita costs in Orlando are somewhat surprising (see Figure A-36) (Texas 2001). While the Roadway Congestion Index for Orlando was *below average* for 1998, 1999, and 2000, per capita congestion costs for those years were *above average.* When population is accounted for, it appears that individuals in Orlando lost more money due to traffic congestion than what one would expect based on the city's RCI. While the per capita cost data appears to be disappointing in terms of smart growth at first glance, I believe such a conclusion would be incorrect. On the contrary, highway traffic in Orlando is congested largely because of the huge tourist population, which is not factored in for this data. While the burden of crowded roadways is evident, Figure A-36 is inconclusive in terms of smart growth because the tourist population is clearly a confounding variable.

Traffic Delay Hours

The next few figures get to the heart of one of the most basic arguments for controlling sprawl by presenting longitudinal data for the number of hours individuals spent in traffic delays per year. As mentioned in a previous chapter, smart growth advocates often appeal to their audience by describing sprawl in terms that the average person can identify with (Mitchell 2001, "Problems" 2000). One method is by detailing the average amount of time lost because of traffic conditions.

Figure A-37 shows Baltimore, Atlanta, and Orlando, graphed together over an 18-year period (Texas 2001). Findings from the previous few traffic congestion sections are reinforced. In comparison with each other, it is evident that individuals in Atlanta have spent the most time in gridlock overall, while those in Baltimore have spent the least. In fact, theoretically, in the year 2000, every individual in Atlanta spent 33 hours delayed in traffic, while those in Baltimore spent only 20 hours apiece in congestion. Orlando showed an unsteady upward trend in delay hours as well, with residents spending 31 hours each sitting in traffic in 2000. Figures A-38, A-39, and A-40 compare each of the cities individually with the average annual hours of delay for other cities in the same size category.

Baltimore fared better than both other cities for the measure of traffic delay hours per person (see Figure A-38) (Texas 2001). It is interesting to note, however, that the series of data points reveals great fluctuation and irregularity in the trend. After state legislation passed in 1992, no dramatic effect on delay hours is seen for several years. After 1997, however, the year of Governor Glendening's program implementation, delay hours dropped for the consecutive 2 years. For the final four years of the study, the net increase in per person hours of traffic delay was only one. Overall, delay hours in Baltimore followed the trend for average hours fairly closely. In terms of smart growth, positive results are apparent after 1997.

Figure A-39 shows some positive findings for Atlanta in the years immediately after Georgia's smart growth legislation was enacted in 1989 (Texas 2001). Not only was there a decrease in hours of delay from 1990 to 1991, but also delay hours in Atlanta dropped below average in 1990, 1991, and 1992. Annual person hours of congestion delay in Atlanta were above average before the law was enacted. It appears that the law did have some effect on hours spent in traffic, although those effects were not long lasting. In fact, from 1992 through 1996, delay hours climbed steadily. After that year, there was fluctuation, and perhaps some leveling-off of the trend.

In terms of smart growth achievement for this measure in Orlando, the data shows mixed results that are more negative than positive (see Figure A-40) (Texas 2001). After year 1985, when Florida's smart growth law was enacted, personal hours of traffic delay generally continued on an upward trend through the year 2000. However, the trend was not one of a steady increase. Rather, the graph reveals that there was leveling-off of delay hours in 1993, 1994, and 1995. There was also a dip in hours from 1998 to 1999. It is possible that the legislation was responsible for keeping the delay hours from skyrocketing, as was eventually the case in Atlanta.

On the other hand, annual hours of per person traffic delay in Orlando were consistently above average for each year except 1990 (Texas 2001). According to the data, person hours for Orlando began to quickly outpace average hours in 1996. In 1998, individuals in Orlando spent seven more hours in traffic delays than did those in other large cities, and by 2000, the difference had increased to nine hours.

Wasted Fuel

In this section I will examine longitudinal trends in wasted fuel for each city. Traffic congestion results in wasted gasoline and diesel fuel, in addition to lost time and money. The Texas Transportation Institute (2001) developed a measure for gauging wasted fuel over time. According to the TTI website, "wasted" fuel is the difference between the true amount of fuel consumed under existing conditions on freeways and principal arterial roadways, and the amount of fuel consumed under ideal conditions, or if all traffic was "free-flowing".

Based on this formula, Figure A-41 shows annual wasted fuel in Baltimore, Atlanta, and Orlando in millions of gallons (Texas 2001). In comparison with each other, Orlando had the least wasted fuel in each of the years. Atlanta and Baltimore had similar figures to each other from 1982 to 1992. After that time, wasted gallons of fuel in Atlanta soared, while the trend in Baltimore was one of a less dramatic increase. In the year 2000, Orlando and Baltimore showed 58 million and 75 million wasted gallons each, respectively, while Atlanta significantly surpassed them both with 166 million gallons of wasted fuel. Figures A-42 through A-44 illustrate the difference in trends between each city and the "average" for other large cities.

Figure A-42 shows that the pattern of increase in wasted fuel for Baltimore varied tremendously by yearly totals (Texas 2001). Fuel totals stayed close to average from 1982 to 1985, and then skyrocketed. Wasted fuel in Baltimore increased from 18 million gallons in 1985 to 49 million gallons in 1990. Figures for Baltimore were consistently above what was average for cities of the same size.

Maryland's smart growth initiative may have had some positive effect on wasted fuel totals (Texas 2001). After 1992, traffic congestion did continued to consume more gasoline in each progressive year, but there was a slight decrease in the rate of growth from 1994 to 1996. After 1997, total wasted fuel dropped from 69 million gallons to 64 million in 1998. In 1999, it rose once again, to 67 million gallons. While I consider Maryland's smart growth program to have begun in 1992, 1997 was the year Glendening instituted the state's "official" smart growth plans. If the dip in wasted gas totals from 1997 to 1999 was due to Glendening's programs, that decrease was a tremendous achievement when compared with results in Orlando (detailed below).

Wasted fuel totals in Atlanta also largely outpaced what was average for cities in the "large" population category (see Figure A-43) (Texas 2001). Atlanta stayed about 20 million gallons higher each year, until 1993 when wasted fuel readings in the city began to skyrocket.

Smart growth legislation in Georgia does not appear to have had more than only a short-lived effect on the amount of wasted fuel in Atlanta (Texas 2001). Figure A-43 indicates that after 1989, when the law was enacted, wasted fuel totals dropped slightly from 42 million gallons in 1990 to 41 million gallons in 1991. After 1991, however, the steady increase began. A drop in wasted fuel totals was seen in 1999, but in the following year continued to spike upward.

Figures for Orlando, on the other hand, remained below average for each of the years shown (see Figure A-44) (Texas 2001). In addition, the rate of increase for the trend line in Orlando was less steady than that for other large cities. The annual amount of wasted fuel in the city varied from 12 million gallons below average in 1990 to just 3 million gallons below average in 2000.

After the inception of statewide smart growth requirements in 1985, the annual amount of wasted fuel in Orlando continued to climb (Texas 2001). The single exception to the trend was from 1998 to 1999, when wasted fuel totals held at 47 million gallons. As mentioned, the amount of yearly increase fluctuated widely. Smart growth legislation may have modest success in this case by keeping yearly totally from radically jumping between about 1991 and 1997. Overall, however, wasted fuel has continued to increase over time.

Summary Conclusions

Each of these three cities showed significant roadway congestion. Of the three, roadway congestion trends in Orlando were most promising in terms of smart growth goals. Orlando generally showed results similar to or better than "average" for other large cities. In particular, wasted fuel totals were lowest in the city. For the remaining variables, including the RCI, costs of congestion, and hours of delay, Orlando showed mixed, yet encouraging results.

Baltimore's roadway congestion trends results placed that city after Orlando, but clearly ahead of Atlanta. In several instances, measures for Baltimore were below what was average for same sized cities, yet the trend was always one of increase toward less desirable measures. Atlanta consistently fared the most poorly with skyrocketing traffic congestion, delays, and wasted gasoline.

Objective #4: Protect Natural Resources

Protection of natural resources is a central tenet of smart growth philosophy (Anderson and Tregoning 1998, Beaumont 1999, Briechle 1999). Indeed, as discussed throughout earlier chapters, it has often been the exploitation of natural resources that eventually led to adoption of smart growth policies. Land, air, water, wildlife, and even human life are all valuable natural assets for states and cities (Audubon 2001, EPA "Air Quality" 2004). Protection of each of these elements contributes to the environmental component of a smart growth program (Anderson and Tregoning 1998, Beaumont 1999, Briechle 1999).

While protection of natural resources has many facets, as listed above, air quality is the factor selected for this study for a couple of reasons. One reason is that air quality is a vital and indisputable indicator of the health of an environment. It has been shown to affect the well-being of many living things, including humans, domesticated and wild animals, insects, and plant life (EPA "Air Quality" 2004). Air quality also affects the aesthetics of an area. When particulate matter is suspended in air in the form of smog, visibility is reduced. Heavy smog may in turn discourage tourism and other commerce, as well as cause traffic accidents (EPA "Air Quality" 2004).

A second reason for selecting air quality is that longitudinal data is available for each of the three test cities from the US Environmental Protection Agency (EPA "AirData" 2004). Details on EPA data I will utilize are included in the following section. Since the EPA assembles data at the national level, I can reasonably assume that collection and reporting measures are standardized for cities. While data is available for some of the other natural resource variables, much of it is county, region, or state level data, and therefore of little use in this research. In addition, information for many of the other variables is not collected in a standardized fashion. In some cases, states themselves collect data unilaterally, while in other cases, interest groups collect data that is limited to certain geographic areas.

In spite of my reasoning for its inclusion, I must caution the reader that air quality is somewhat controversial as a measure of smart growth. Critics of its use charge that it is unreliable because many other factors also contribute to the condition of the air (Bishop and Tilley 2002, Gordon and Richardson 1998). Some of these alternative causal variables are meteorological conditions including wind flow patterns, local geography that might tend to concentrate levels of harmful emissions, and industrial development (Green 2001). The existence and contribution of each of these rival causal variables is indeed significant and important to recognize. The movement of currents of air is important to consider when examining trends of air pollution because they naturally flow freely across jurisdictional boundaries. In other words, car exhaust originating in Detroit may be swept into the South and deposited as acid rain in Atlanta. Concern with geography is another logical criticism. Cities located in a valley surrounded by mountains may exhibit a higher incidence of air pollution, for example. Lastly, the extent of industrialization of an area is also telling because of associated air and water emissions (Green 2001). Indeed, each of these factors may impact local air quality.

My rebuttal to the above criticism is that *any single* variable, including air quality, is flawed as indicative of the success or failure of a smart growth program. Responsible policy analysis requires consideration of multiple variables carefully measured over time, and examined within the context of other features of the local government (local topography, for example). It is within this context that I will consider air quality, as a single part of a complex whole. Further, as discussed earlier in this chapter, the evaluation of smart growth programs has become an important and timely research pursuit as programs mature and new ones are implemented. Preliminary research such as this will be dependent on available data. Perhaps as city and state governments recognize the importance of systematic evaluation of program goals, an increasing amount of useful data will be collected.

In the following section I will provide a more detailed examination of what information the EPA collects and how I will use it to evaluate air quality trends in Baltimore, Atlanta, and Orlando.

Air Quality Data

As discussed above, the US Environmental Protection Agency (EPA) collects and records information regarding air quality in metropolitan areas (EPA "Air Quality" 2004). The data collected from hundreds of monitoring stations is used to calculate the daily AQI, or Air Quality Index, for a location. The AQI measures five major air pollutants that are regulated by the Clean Air Act. These are ground level ozone (O_3), particulate pollution/matter (PM), carbon monoxide (CO), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2). An explanation of the dangers associated with each of these pollutants and an examination of levels of these pollutants in each city will be provided later in this section.

In large cities (those with populations over 350,000), including the three selected for this study, state and local agencies are required to report the AQI to the public each day. This data includes the entire metropolitan area, and does not distinguish between central city and suburbs. It is useful, as well as unavoidable, to monitor conditions for the MSA as a whole, because airborne pollutants are not restricted within the artificial boundaries of any jurisdiction. Based on this information, the number of days per year when air quality was "good" (AQI 0-50), "moderate" (AQI 51-100), "unhealthy for sensitive groups" (AQI 101-150), "unhealthy" (AQI 151-200), "very unhealthy" (AQI 201-300), or "hazardous" (AQI 301-500) is calculated. Generally, a daily AQI of 100 or less is considered by the EPA to be acceptable (EPA "Air Quality" 2004).

Uniform data for air quality measurement is available from the EPA for a 10-year span, from 1993 to 2003 (EPA "AirData" 2004). Since 1993 is the earliest date available, I will be examining a trend that occurs entirely after each state's legislation was implemented. The one exception is that I will consider the effects of Maryland's second piece of smart growth legislation that was adopted in 1997. Since I cannot utilize a pretest/posttest approach with my examination of air quality, I am relying primarily on theory to ground my conclusions and tentatively eliminate *z* variables, where possible. The general line of theory I am employing throughout the examination of air quality is the following: Over the 10-year period that began in 1993, in Baltimore, Atlanta, Orlando, many factors contributed both directly and indirectly to pollute the air. Some of these polluting factors may have included increased populations, heavier traffic, industrial development, and even lifestyle choices. Accordingly, there are few x variables that might reasonably explain an *improvement* in air quality besides an organized effort by the government, in the form of smart growth programs. However, as stated previously, I will not conclude that any one factor is solely responsible for either the deterioration or improvement of air quality.

"Good" versus "Unhealthy" Air Quality Days

In order to examine air quality in Baltimore, Atlanta, and Orlando, I will graph a comparison between number of days with "good" air quality, and number of days with "unhealthy" air quality in each city over a 10-year period. I will utilize the EPA's definition for "good" air quality days, while for my analysis of "unhealthy" days, I collapse several categories, making an AQI of over 151 "unhealthy".

Figure A-45 shows the comparison of good to unhealthy air quality days in Baltimore (EPA "AirData" 2004). Generally, the number of good air quality days per year increased from 1993 to 1996, then decreased after that time. As for unhealthy air quality days in Baltimore, the data for the 10-year period show a fairly stable trend, with no year having more than 19 days of unhealthy air. In addition, the year 2003 was a rebound year for healthy air in Baltimore, as unhealthy days dropped from 19 to 2, and good air days increased from 159 to 176.

These are interesting findings in light of the dates Maryland enacted smart growth legislation. While I cannot observe pretest figures for the 1992 legislation, it is clear that good air quality days were on the rise for at least three years afterward, increasing from 233 days in 1993 to 277 days in 1996. I cannot state that Maryland's first piece of smart growth legislation was responsible for the positive trend, but, results seen are in line with smart growth objectives and the legislation cannot be excluded as possibly causal.

On the other hand, findings for the 1997 legislation are not immediately suggestive of program success. The number of good air quality days in Baltimore decreased from 275 in 1997 to 159 in 2001 (and 2002). Given the steady increase in good air days prior to adoption of the 1997 law, it appears that adoption of the law coincides with a decrease in air quality. While this finding is perplexing, at least two explanations are possible. First, it must be noted that there was a gradual leveling-off of good air days prior to the second piece of legislation, in addition to a slight decrease in days from 1996 to 1997. These two pieces of information suggest the possibility that annual number of good air days was beginning a trend of decline that would have occurred regardless of the adoption of smart growth legislation in 1997. In that case the law would be unrelated to the subsequent trend.

However, it may also be true that the decline in healthy air days was due to the 1997 legislation. While this is not immediately recognizable as desirable, it may in fact be, indirectly. It is possible that the legislation quickly spurred construction, demolition, or alteration of structures (Green 2001). A sudden boom in construction of affordable housing, for example, might have temporarily harmed air quality due to exhaust from the equipment used and particulate matter generated. In short, the City of Baltimore may have sacrificed some degree of air quality in the short term in order to produce long-term smart growth benefits. As for overall air quality measures in Baltimore, I will have to declare these results as mixed and inconclusive.

I will now review trends in both good and unhealthy air days for Atlanta and Orlando from 1993 to 2003. I will remind the reader at this point that pretest data is not available for either city, as Georgia enacted smart growth legislation in 1989 and Florida enacted smart growth legislation in 1985. As a result, evaluations for these cities will be posttest trends only.

Figure A-46 shows the comparison of good and unhealthy air quality days for the Atlanta metropolitan region (EPA "AirData" 2004). The graph displays trends similar to those of Baltimore, but with steeper peaks and valleys. The graph shows that while the number of days with an unhealthy AQI has remained fairly constant, at under 50 days per year since 1993, the number of good air quality days has varied widely. Like Baltimore, Atlanta experienced a marked decrease in the number of good air quality days after the year 1997. 1999 was the year of fewest good air quality days, totaling 69, before the gradual improvement through 2003. Overall, the number of good AQI days fell from 248 in 1993 to 161 in 2003. This is clearly not a desirable long-term trend as far as smart growth achievement.

Results for Atlanta are somewhat surprising. I expected to observe the tremendous dip in good air days to be prior to 1996 rather than beginning about two years later. This is because from 1993 to 1996 the City of Atlanta was in the final stages of preparing for the Olympics. During that time, the city was a virtual sea of construction equipment as new apartments and Olympic venues were created and infrastructure was updated (Bullard 2000). I expected airborne equipment emissions and related particulate matter to negatively impact air quality during those years. If Olympic construction did harm air quality prior to the 1996, something occurred after 1996 to cause greater harm. As I hypothesized for Baltimore in the previous section, it may be the case that smart growth legislation was beginning to take effect in Atlanta after 1997, causing short term increases in air pollution as long term benefits were sought. On the other hand, it may be that increasing traffic congestion, as seen for Atlanta in previous graphs, contributed to reduce air quality over time. In either case, the trend seen in the graph is troubling within the context of this study. In spite of the rebound that occurred beginning in 2000, number of good quality air days in Atlanta is evidently leveling-off at about 161 per year.

For the City of Orlando, overall air quality was reasonably good for the entire 10-year period (see Figure A-47) (EPA "AirData" 2004). From 1993 to 2003, Orlando experienced only one day of unhealthy air quality, based on AQI data. That particular day was in 1998, as the graph illustrates. As for yearly totals of good quality air, both positive and negative findings are evident. The positive finding here is a historical one. For the entire 10-year span, good air days occurred at least 246 days out of 365. This is in stark contrast to results in both Baltimore and Atlanta. At the same time, the overall trend in good quality air days is clearly declining overall. In fact, healthy air days fell from a high of 325 in 1993 to a low of 246 in 2003. Based on this trend of steady decline, I will conclude that Orlando shows undesirable results for this component of smart growth.

Now that I have evaluated trends in overall air quality for Baltimore, Atlanta, and Orlando, I will examine trends in a couple of particularly damaging airborne pollutants for the cities.

Ozone and Particulate Matter Trends

As discussed above, Air Quality Index figures take into account the daily concentrations of five common pollutants. These are ground level ozone (O_3), particulate pollution/matter (PM), carbon monoxide (CO), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2). The EPA then publishes the number of days per year when each of these five pollutants was the primary pollutant in the city. Each of these pollutants has unique origins in a metropolitan area as well as unique health risks for people (EPA "Air Quality" 2004). I will now provide basic information regarding each of these airborne pollutants before I determine which ones were most prevalent in Baltimore, Atlanta, and Orlando from 1993 to 2003.

Ground level ozone (O_3) is not to be confused with beneficial ozone that occurs naturally in the Earth's upper atmosphere. Between six and thirty miles above the planet's surface, ozone forms a protective barrier that shields living things from the sun's damaging ultraviolet rays. Ground level ozone, on the other hand, is formed when pollutants primarily from cars and power plants undergo chemical reactions in the presence of sunlight. Ozone is the major component of smog. It is hazardous to people and animals because it diminishes lung capacity, causing shortness of breath (EPA "Air Quality" 2004).

Particulate pollution, including dust and soot, is another major threat to air quality. Pollution of this type is made up of both solid particles and liquid droplets that are suspended in the air. Particulate matter may be thrown into the air by automobile traffic, emitted from factories that grind materials, produced on construction sites, and formed in chemical reactions. Airborne particles are dangerous because those that are smaller than 10 micrometers in diameter can be inhaled into human lungs, causing respiratory distress or infection (EPA "Air Quality" 2004).

Carbon monoxide (CO) is another pollutant monitored by the EPA. CO is a colorless, odorless gas that forms when the carbon in fuels does not completely burn. Most of this gas in cities is discharged from cars, but it also forms from other types of combustion, like forest fires. Prior to about the year 2000, CO was a major source of pollution for cities, including those in this research. That trend was reversed, however, when federal legislation mandated that emission controls be installed on new vehicles. Carbon monoxide is dangerous to humans because it enters the bloodstream through the lungs where it binds itself to the body's hemoglobin- the substance that delivers oxygen to cells. This causes a decrease in the amount of oxygen to eventually reach organs and tissues (EPA "Air Quality" 2004).

Sulfur dioxide (SO_2) is another harmful gas. It is produced when sulfur fuels, such as coal and oil are burned. When a healthy person is at rest, and breathes SO_2 through his or her nose, the nasal passages can remove the gas particles. However, when exercise causes an individual to breathe through his or her mouth, sulfur dioxide can enter the body. The gas can cause wheezing and shortness of breath, and is especially irritating for asthma sufferers. Sulfur dioxide is also one of the main components of acid rain, which is dangerous to plant life and damaging to physical structures, such as buildings and bridges (EPA "Air Quality" 2004).

The fifth potential threat to air quality that is monitored by the EPA is nitrogen dioxide (NO_2). This gas is important to measure because when it combines with "volatile organic compounds", or VOCs, ground level ozone is formed (EPA "Air Quality" 2004).

In order to obtain a clearer picture of air pollution trends in the selected cities, I examined EPA data and determined the two primary pollutants in each of the cities over the 10-year period. In each case, ozone (O_3) and particulate matter were the main toxins (EPA "AirData" 2004). All three cities exhibit a similar general trend over time. The number of days per year O_3 was the main pollutant has decreased while the number of days per year particulate matter was the main pollutant has increased. I must remind the reader at this point that EPA data is a report of the number of days per year each of the pollutants was most significant. Data points are not actual measures of the concentration of a gas or particulate. The implication of this is that if O_3 levels decrease in a city, so that the gas is not the primary pollutant, then the next highest-level pollutant automatically becomes number one. In this case, particulate matter becomes the number one pollutant over time, but that does not necessarily mean that actual concentrations of particulates are skyrocketing. Figures A-48, A-49 and A-50 illustrate a comparison between the number of days per year O_3 and PM were the primary air pollutants in Baltimore, Atlanta, and Orlando, respectively (EPA "AirData" 2004).

While the graph for each city displays unique characteristics, the same general trend is evident in each case (EPA "AirData" 2004). Each of the three cities experienced a decrease in O_3 days beginning between 1999 and 2000, accompanied by a simultaneous increase in PM days. Figure A-48 shows the pattern in Baltimore. The trend for ozone days in the city is particularly interesting because there was a gradual rise in yearly ozone days until 2000, when the number of days plummeted from 270 to 141. This was followed by a continued decrease in ozone days through 2003. Further, Baltimore shows a pattern of fewer than 50 particulate days for the first several years, then a tremendous jump to over 200 days per year in 2000 through 2003. Of particular note is the increase from 225 PM days in 2002 to 262 days in 2003. I will discuss the implications this has for smart growth below.

Figure A-49 shows a similar trend in Atlanta (EPA "AirData" 2004). The major difference in Atlanta, however, is that prior to the jump in particulate matter days in 1999, ozone days had been slowly decreasing. While Baltimore had a high of 270 PM days in 1999, Atlanta's total of PM days had fallen to only 106. Two other major differences can be seen between the graphs for the two cities. One is that number of PM days in Atlanta jumped in 1999, whereas the jump occurred in 2000 in Baltimore. The second is that after that initial increase, particulate matter days in Atlanta basically stayed between 250 and about 300 days per year, while total PM days in Baltimore continued to be between 200 and 250 per year. Like Baltimore, Atlanta did, however, show a jump in PM days from 2002 to 2003. After a review of trends in Orlando, I will consider the implications for smart growth in each of the cities.

The graph for Orlando contrasts with the graphs of Baltimore and Atlanta in two significant ways (see Figure A-50) (EPA "AirData" 2004). One is that after 1999, the total number of particulate matter days and ozone days per year in Orlando remained relatively similar to one another. In other words, there was not a huge difference between PM days, the higher of the two, and O_3 days. The second major difference was that in Orlando, PM days dropped from 194 in 2002 to 130 in 2003. In 2003, number of ozone days once again exceeded PM days in Orlando.

The information gleaned from these three graphs, considered in light of the trends in overall air quality reviewed above, suggests several findings. Primarily, it seems evident that both Baltimore and Atlanta have histories of poor air quality that may be attributable in part due to those short term sacrifices associated with smart growth described above, while Orlando is simply losing its good air quality rating. In short, desirable changes (while indirect) are seen in Baltimore and Atlanta, while undesirable changes are seen in Orlando.

My reasoning for these conclusions is based on a number of observations. In Baltimore and in Atlanta, the final few years of data indicate a gulf of separation between PM days that were high in totals and O_3 days that were low in totals. It is likely that the decrease in ozone days indicates better control over related pollutants, while the increase in PM days indicates construction, renovation, and rebuilding projects. I will remind the reader at this point that both of these cities have histories of serious air pollution that led to EPA designations as "nonattainment areas". In both cases, significant measures have been taken to reduce the creation of ozone so that an acceptable rating by the EPA can be reinstated. In addition, the increase in particulate matter days in both of these cities is likely indicative of major construction efforts. PM is generated by debris being flung into the air, especially by pounding, drilling, sawing, and other actions employed by workers involved in construction (EPA "Air Quality" 2004). Smart growth programs often require many construction projects in order to, for example, update or restore downtown buildings, reclaim and "clean" old industrial sites, build affordable housing, improve existing housing, and to demolish dilapidated buildings (as Baltimore has done) (Anderson and Tregoning 1998). All of these projects listed have been employed in Baltimore and Atlanta since the inception of smart growth efforts by the respective states, and all of the projects create some amount of particulate matter (City of Atlanta 2004, City of Baltimore 2004, City of Orlando 2004). In sum, I do not believe that Figures A-48 and A-49 were necessarily indicative of the failure of smart growth programs to maintain or improve air quality.

Trends seen in Orlando, however, are clearly undesirable. Air quality has steadily declined in the metropolitan area over the 10-year period, although the EPA has not declared the city a "nonattainment" area. In addition, totals for particulate matter days and ozone days in the city were similar to one another from 1999 to 2003 (as opposed to findings for Baltimore and Atlanta). This means that I probably cannot attribute the city's deteriorating air quality to an increase in construction projects spurred by the desire to achieve smart growth.

As shown in previous sections of Chapter IV, both the city and suburbs of Orlando have continued to grow largely unhindered in terms of population and physical size (Bureau of Census "State" 2004). Air quality has been at least partially maintained by the steady sea breeze from the Gulf of Mexico, and by Orlando's location on a peninsula, far from transient pollution produced by the country's "rust belt" (Porter 1997). The graphs generated by EPA data suggest that Orlando does not have the motivation to immediately improve air quality that is associated with cities designated EPA nonattainment areas. Rather, Orlando is slowly slipping toward air quality problems as it enjoys the economic and social benefits of unchallenged growth.

Summary Conclusions

Results for these air quality indicators are not entirely straightforward, as I have explained above. Based strictly on the data analysis, Orlando showed the most desirable results for the tests of air quality. The overall number of "good" air quality days was highest in Orlando, and trends for ozone and particulate matter pollution were generally on the decline. Baltimore and Atlanta, in contrast, both showed significant reduction in days of ozone air pollution, yet overall air quality continued to deteriorate in both cities.

When the data trends are considered within the unique contexts of each city, however, results for Orlando appear less desirable while Baltimore and Atlanta are partially redeemed. The totality of evidence suggests that Orlando is gradually losing the healthy quality of its air, while Baltimore and Atlanta have sacrificed some degree of healthy air in the short term to insure it in the long term. I will provide further discussion of this point in Chapter V.

Objective #5: Create Equitable, Desirable Neighborhoods

The creation of equitable, desirable neighborhoods is a central part of smart growth efforts (Godschalk 1992, Innes 1993, Merriam 2003). As with the four previous objectives, this one is necessarily intertwined with other smart growth goals. For example, equitable neighborhoods decrease the incidence of segregation. If there is a range of quality housing in a neighborhood, households with a variety of incomes can live alongside each other (Katz and Bradley 1999). In addition, creation of desirable neighborhoods can help to reinvigorate an inner city or neglected suburban neighborhood as permanent residents settle there. Further, equitable and desirable neighborhoods are less likely to be hosts to dangerous conditions including drug related crime and some types of environmental pollution (Beaumont 1999). Clearly, creation of desirable neighborhoods possibly helps with attainment of other smart growth goals.

In this section I will examine trends in total housing units available, median rents, and financial hardship associated with rents for each of the three cities. As I analyze the data I will consider how these variables are affected by smart growth programs implemented in each city.

Total Available Housing

Baltimore, Atlanta, and Orlando have each seen a steady increase in the total number of housing units available (Bureau of Census "State" 2004). For each city, growth in the number of units available in the suburbs has greatly outpaced the number of units available in the central city. This is not surprising given the findings for "Objective #1", where it was shown that each city's overall population had continued to increase, particularly in the suburbs.

Housing availability in Baltimore has increased for the entire MSA, but census figures for the inner city show a gradual decline in available units (see Figure A-51) (Bureau of Census "State" 2004). While there were 305,088 units available in 1970, by the year 2000, only 299,024 were available in the inner city. For members of the urban poor who have little prospect of being able to leave the central city, a loss in housing availability is a critical issue (Rusk 1993). On the other hand, as I discussed earlier in Chapter IV, some of this loss has been due to demolition of unsafe properties (City of Baltimore 2004). Overall, in terms of achieving smart growth goals, Baltimore scores poorly in this respect. While destruction of decrepit housing is a positive step, the central city has a net loss in total housing units. The most desirable outcome from a smart growth perspective would have been to replace demolished housing with quality affordable housing at a pace such that the number of total units remained steady or even increased. Furthermore, if quality affordable housing were offered throughout the central city of Baltimore, perhaps the steady flight out of the city by those who can afford to leave (as shown in Figure A-9) would be reduced.

Results for Atlanta are more in line with achievement of smart growth (Bureau of Census "State" 2004). Figure A-52 shows that in Atlanta (MSA), housing units in the inner city increased by 14,975 from 1970 to 2000. In the suburbs, on the other hand, almost 1 million new units became available during the same time frame. In light of population trends in Atlanta, these results are generally favorable. When the data points are considered in terms of state policy implementation in 1989, findings are desirable. In the central city, after 1989, number of available units grew by a small number from 1990 to 2000. Based on the literature review presented earlier, I know that much of this increase was due to preparation for the 1996 Atlanta Olympics. At the same time, as in Baltimore, many substandard units were destroyed. Atlanta scores well here because despite the loss of housing units to demolition, the number of available units in 2000 did surpass the total in 1990.

The availability of housing in the Orlando MSA has also steadily increased since 1970, but with at least one significant difference from housing growth patterns in Baltimore and Atlanta (see Figure A-53) (Bureau of Census "State" 2004). In Orlando, the *central city* has seen a surge in total housing units over the entire 30-year period. In fact, there were 50,472 more units in 2000 than in 1970. This trend is in accord with the inner city's growth in population (as was shown in Figure A-11). This is a desirable output for a smart growth program because it may influence other factors as well, such as inner city revitalization, decreased reliance on cars, and basic social equality. Unfortunately, I cannot determine whether the program is responsible for the desirable trend shown on the graph after the year 1985 because it may be simply a continuation of the trend line during the "pretest" years.

Median Household Rents

Smart growth programs seek to not only provide safe housing for individuals, but they also are used to insure social equity (Anderson and Tregoning 1998, Katz and Bradley 1999). In other words, advocates argue that safe homes should be in neighborhoods constructed with a mix of housing types to accommodate households of different socio-economic status. Further, housing costs in the suburbs should not be significantly higher than housing costs in the city, as this forces low-income households to remain in the city (Katz and Bradley 1999). The underlying premise is that the cost, condition, and location of housing should not be means for discrimination or segregation. A successful smart growth program will produce rents in the city and suburbs that are comparable, and not separated by a gaping rift. If rents are reasonable and comparable in both locations, residents are provided with choice in where they might live (Walljasper 2001).

The median cost of renting a home, including both apartments and houses, has varied widely between the three cities (Bureau of Census "State" 2004). Figures A-54, A-55, and A-56 show the comparison between median household rents in the central city and suburbs of Baltimore, Atlanta, and Orlando, respectively. All figures have been converted to 1999 Dollars to allow for comparison.

As shown in Figure A-54, median household rents in the central city and suburbs of Baltimore have changed together over time (Bureau of Census "State" 2004). While a wide disparity between the two has continued to exist, both decreased from 1970 to 1980, increased from 1980 to 1990, and decreased once again from 1990 to 2000. The first evident finding from Figure A-54 is an undesirable one: It has cost significantly more to live in the suburbs of Baltimore than in the city over the entire 30-year period. As stated above, this tends to keep lower income, usually black families in the city, while middle class, usually white families move to the suburbs (Katz and Bradley 1999).

I am primarily interested in the trend after 1992/1997 compared with the trend in cost of rents before that time. Two "post-test" findings are evident in Figure A-54 and neither is desirable in terms of smart growth. One is that from 1990 to 2000, the gulf between rents in the city and suburbs grew rather than shrank. The second is that, unlike in Atlanta and Orlando (as will be shown below), rents in Baltimore MSA have *decreased* since 1990. In the suburbs of Baltimore, median rents fell by only $10 from 1990 to 2000. I am interested in what occurred in the inner city, where median rents fell from $526 in 1990 to $482 in 2000. Based on my previous investigation of housing conditions in Baltimore, I know that this is an alarming trend. It is reflective of both the deterioration of the housing stock in the city and the continued flight of residents outward from the city. Overall, Baltimore scores poorly for this variable.

Figure A-55 shows the comparison of median rents in Atlanta (Bureau of Census "State" 2004). Rental costs for the central city and the suburbs have both generally increased at about the same rate, but with a large disparity between city and suburb rent costs. After smart growth legislation inception in 1989, the gulf between suburban and inner city rents remained wide. In 1990, median household rent in the city was $538, while in the suburbs it was $695. In 2000, median city rent had increased to $586, while rent in the suburbs had escalated to $740. This is an undesirable finding in terms of smart growth because it means that households with low incomes are less able to afford to move to the suburbs, where quality of life is generally better. Segregation according to income is reinforced.

On the other hand, a desirable finding is that median rent in the central city of Atlanta increased by about $50 after the smart growth program began in 1989. As I discussed earlier in Chapter IV, the City of Atlanta spent tremendous resources on developing quality affordable housing in the city after 1989. The increased rent in the inner city indicates that there is demand for that housing, and that the stock of housing is of sufficient quality to warrant the increase. These are important factors in keeping the city populated and vibrant. Overall, results for Atlanta are mixed, with one desirable finding and one undesirable finding.

The trend in household median rents in Orlando is wholly different (see Figure A-56) (Bureau of Census "State" 2004). While both urban and suburban rent costs have increased over time, *urban rents have more sharply inclined*, meeting the price of suburban rent near the year 2000. In fact, from 1990 to 2000, median rents in Orlando suburbs nearly leveled off, increasing by only $14. At the same time, median city rents increased by $32 to reach the same figure. These findings are mixed in terms of progress toward smart growth. One positive finding is that the 1985 Florida legislation appears to have narrowed the divide between city and suburb rents (until they became about the same in 2000). It is also positive that suburban rents have not continued to rapidly increase, as they did in earlier decades.

On the other hand, for many who live in the city of Orlando, housing is becoming less affordable. For Atlanta, an increase in median city rents was concluded to be a primarily positive finding because it lessened the tremendous gulf between city and suburb rents and because it demonstrated quality and demand for city housing. Circumstances are different in Orlando, however. Affordable housing in the city is a concern because average incomes are low (City of Orlando 2004). I explained earlier in this chapter that Disney World and other theme parks are top employers in Orlando. Many of those employees make low hourly wages in nonprofessional positions. Rents in the city of Orlando are increasing over time because of the booming population and tremendous demand for housing. Also, many recent housing projects are part of the central city's revitalization efforts, which includes upscale "new urban", mixed use housing developments (Jelic 2003). In conclusion, I find mixed results for Orlando in terms of median rents and smart growth objectives.

Housing Cost Burden and Households With "Any Housing Problems"

In addition to housing availability and affordability, the issues of substandard housing and housing "cost burden" are addressed by smart growth programs (Anderson and Tregoning 1998). Data collected through a federal program called the *Comprehensive Housing Affordability Strategy*, or CHAS, allows for an examination of the prevalence of substandard housing and cost burden for households (including rented and owned properties) in each of the three cities (Bureau of Census "State" 2004). In this section I will review and analyze data for each test city in regard to the percentage of households with "any housing problems" and the percentage of population with a housing cost burden greater than 50% of their income. CHAS defines "housing problems" as "a cost burden greater than 30% of income, and/or overcrowding, and/or without complete kitchen or plumbing facilities".

While CHAS data is valuable to this study because it allows for analysis of information that otherwise would not be available, it does have limitations. The most important limitation to note is that data is only available for years 1990 and 2000. For the city of Baltimore, I am able to consider these two data points to be pre-test and post-test scores (because of Maryland's smart growth legislation implementation in 1992 and 1997). For Atlanta and Orlando, however, this analysis will be post-test only, and subject to the limitations discussed earlier in Chapter IV. One other condition to note is that CHAS data does not distinguish between city and suburbs. Rather, I will be examining the metropolitan area as a whole.

In the discussion of findings to follow, I will examine two graphs, or figures, for each city before proceeding to discussion of the next city. The first graph will be a comparison in the percentage of total households with "any housing problems", and the second will show the percentage of population in the MSA with a housing cost burden greater than 50% of household income.

As I mentioned above, CHAS data reveals conditions in Baltimore both before and after smart growth program implementation by the state of Maryland. Overall, the results for these measures are likely not desirable in terms of smart growth achievement (Bureau of Census "State" 2004). They are results I expected to observe based on previous data results for the city. Figure A-57 shows that the incidence of "housing problems" actually increased for whites, blacks, and Hispanics from 1990 to 2000. In addition, the percent of total households with any housing problems increased somewhat, from 33% in 1990 to 35.6% in 2000. While housing problems did increase for each of the three races graphed, conditions continued to be worst for minorities in 2000, with 39.5% of Baltimore's black population encountering housing problems, and 43.2% of Hispanics encountering housing problems.

Figure A-58 shows more desirable trends in housing cost burden (Bureau of Census "State" 2004). In 2000, about 4% fewer households having the lowest incomes, those less than or equal to 30% of median family income, or MFI, paid a housing cost burden greater than 50% of their income. Conditions also improved slightly for those with incomes 31-50% of MFI. While this finding appears to be in line with smart growth, when considered with all other evidence it is probably indicative of further deterioration in housing stock in Baltimore. It was shown above that rents have been decreasing in Baltimore, so the discovery of "improvement" for housing cost burden is no surprise. However, Figure A-57 showed the increase in housing problems over the 10-year period. Cost of housing has decreased in part because housing stock is old, substandard, or unsafe. The conditions in Baltimore that I have discussed throughout this dissertation are very difficult to reverse. It will likely take several decades to improve the housing stock and return a healthy residential population to the city.

Figures for Atlanta reveal a more positive picture of housing conditions in terms of the objectives associated with smart growth (Bureau of Census "State" 2004). In Atlanta, the overall trend from 1990-2000 was a decrease in the percentage of households with “any housing problems”. The total percentage of households enduring at least one of the conditions considered to be housing problems in Atlanta MSA fell from 41% in 1990 to 38.9% in 2000. While these numbers are desirable, Figure A-59 shows that blacks and Hispanics continue to face housing problems at a higher rate than their white counterparts. For example, although black households experienced improvement over the decade, 44.9% of black households had housing problems in 2000, compared to only 29.2% of white households.

Figure A-60 shows that housing cost burden, or the portion of income a household must pay for housing, has decreased in Atlanta for those households with the lowest incomes (Bureau of Census “State” 2004). This finding is also desirable in terms of smart growth. The chart shows that the percentage of households with an income of less than or equal to 30% of median family income (MFI) whose housing cost burden was more than 50% of their income fell from 47.8% in 1990 to 41.4% in 2000. There was a smaller decrease in housing cost burden for those with incomes between 31% and 50% of MFI. Overall, the City of Atlanta has made progress in the improvement of housing conditions and costs for residents.

For Orlando, analysis of CHAS data produces mixed findings (Bureau of Census “State” 2004). The total percentage of households with “any housing problems”, as defined above, slightly increased from 35% in 1990 to 37.1% in 2000. In other words, more people in 2000 paid a high housing cost burden, lived in crowded conditions, lacked a full kitchen or bathroom, or some combination of those three factors, than did in 1990. Considering the population boom, an increase of only 2.1% in number of household with housing problems over a 10-year period is probably not a significantly negative finding.

However, Figure A-61 shows that, like in Atlanta, minorities in Orlando have a higher incidence of housing problems in either of the years shown.

On the other hand, significant improvement is evident in housing cost burden data for the lowest income households in Orlando (see Figure A-62) (Bureau of Census "State" 2004). The percentage with a household income less than or equal to 30% of MFI who paid more than 50% of their own income in housing costs fell by about 10% from 1990 to 2000. At the same time, the number of people with the same housing cost burden mentioned above, but who earned 31-50% of MFI, increased by about 2%.

Overall, Orlando receives a mediocre score for these two housing measures. Previous figures in Chapter IV have shown the tremendous growth in the city, particularly among minority groups. This burst in population accounts for some of the disproportionate hardship seen for blacks and minorities. At the same time, it is alarming from a social equality standpoint to consider that about half of all black and Hispanic households in Orlando have some sort of housing problem.

Summary Conclusions

For the second time, Atlanta is the city where effectiveness of smart growth programs is most evident. The city had an increasing number of housing units available in both the city and suburbs and a record of overall reduction in number of households with CHAS defined housing problems. Orlando also did well in these categories, but showed somewhat mixed results in terms of the incidence of housing problems, particularly among minority groups. The undesirable results discovered for Baltimore were not surprising, given the city's long struggle with inner city abandonment. Data analysis showed that Maryland's smart growth initiative was unable to increase housing availability in the city or otherwise reduce the incidence of housing problems in the city.

CHAPTER V

CONCLUSIONS

Summary of Research

In this final chapter, I will provide a summary review of my research, followed by concluding thoughts and implications for future research. I will begin with a brief review of the phenomenon known as urban sprawl and its varied effects on communities. Secondly I will revisit the steps taken by governments to alleviate sprawl. This will include a review of the state smart growth legislation classification system I developed. Next I will summarize my methods for evaluating the success of smart growth policy in the states, followed by the preliminary conclusions of the research. Lastly I will detail how this research could be improved and suggest paths for future related research.

The Problem: Urban Sprawl

In the second half of the 20th century, many local governments seemingly awoke to realize an urgent problem at their doorsteps. The urban cores of cities had been abandoned by businesses and citizens alike. Those who fled had left behind only the poor and members of minority groups who could not afford to leave the city. They had left behind contaminated industrial sites and acres of empty buildings. Indeed, pollution of the air, water, and other cherished natural resources had become routine. New growth was occurring in an ever-widening ring outside the deserted city. Forests, open areas, and farmland had been plowed under to accommodate the transplanted growth. Schools were left empty within the city while new ones were constructed in the country.

Eventually places began to loose their uniqueness. Instead, many looked the same-rotting, empty cities surrounded by sprawling suburbs (DeGrove and Stroud 1987, Freilich 1999, Godschalk 1992, "Problems" 2000, Stein 1993).

Reform Reaction

When the reality of the impacts of poor planning practices and environmental abuses took root in the American consciousness, the issue of reform was forced into the political arena (Burby and May 1997, Innes 1993). The question eventually became: *What level of government is best suited to be charged with insuring that land use planning is conducted in a responsible way, and that the abuses of the past will be prevented in the future?* The federal government was eliminated as a possibility. Not only is the country physically too large and diverse to be planned from Washington, but the federal government had also contributed to the land management crisis. In light of these facts, the role of the federal government has generally been restricted to creating and enforcing pollution control legislation (Stein 1993, Weitz 1999).

Local governments were also considered. In many cases, however, local governments had already demonstrated either an inability to effectively perform the task of land use management or a refusal to do so. Some states continued to allow local governments to engineer their own land management plans via state granted enabling legislation (Cullingworth 1997, Porter 1997). An increasing number of states, however, began to conclude that they were best able to insure effective growth planning at the local level. Their argument continues to be that as state governments, they have the best interests of every local jurisdiction in mind; they have greater access to planning resources, money, and staff; and they can exercise a greater coercive power than local governments if necessary (Liou and Dicker 1994).

Legislative programs instituted at the state level in order to develop responsible planning at the local level, are generally referred to as smart growth programs (Leo et al. 1998). Under the banner of smart growth, these policies are intended to bring resources and people back to cities, limit urban sprawl, protect natural resources, reduce traffic congestion, and generally improve the quality of life for citizens. Each state that has instituted smart growth has done so in a unique way in response to the needs and desires of constituents (Staley 2000). While state legislation does vary, generalizations can be drawn about the programs. They may be grouped in categories so they can be studied and understood.

An Improved System of Classification

In Chapter II, I reviewed the major growth management classification systems within the policy and planning literature and examined the benefits and limitations of each. Based on that analysis I developed an improved model from the two most useful schemes, those developed by DeGrove and Stroud in 1987 and Gale in 1992. I then used the new model to categorize state legislation.

Based on the new classification system there are three major types of state smart growth legislation: (1) low coercion/comprehensive-general; (2) medium coercion/comprehensive-general; and (3) high coercion/comprehensive-general. As discussed in Chapter II, each of these types of legislation is applicable to all land use activities throughout the state. While variation exists within each category, legislation of each type contains similar basic elements (DeGrove and Stroud 1987, Gale 1992).

States employing low coercion/comprehensive-general programs generally allow for voluntary participation by local and/or regional governments. These state governments may offer incentives for participation or compliance, which may include grants for local projects or free technical assistance with developing plans. At the same time, sanctions may be used against local governments that do not voluntarily participate (DeGrove and Stroud 1987, Gale 1992).

The middle category is called medium coercion/comprehensive-general. Legislation of this type is diverse, and usually includes a mix of incentives and disincentives. Policies may be mandatory, but perhaps only for jurisdictions of a certain population, or a certain location. In some cases there is a high degree of cooperation, or a partnership of sorts, between the state and local governments (DeGrove and Stroud 1987, Gale 1992).

Lastly, states with high coercion/comprehensive-general legislation generally have mandatory programs. The level of jurisdiction that is mandated to plan may vary by state. For example, regional and local planning may be mandated, or, city and county governments may be mandated to plan. Penalties for noncompliance are stringent. These may include ineligibility to qualify for state sponsored grants and loan programs, or, in some cases the state may intercede and plan for a noncompliant jurisdiction (DeGrove and Stroud 1987, Gale 1992).

After developing the three categories, my next question was: *Of the three types, which produces the best results in terms of smart growth goals?* To answer this question, I developed a list of indicators to examine for one large city in each of three representative states. I chose Maryland to represent the low coercion/comprehensive-general category, Georgia to represent the medium coercion/comprehensive-general category, and Florida to represent the high coercion/comprehensive-general category. Within those states, Baltimore, Atlanta, and Orlando, respectively, were selected as test cities. I then translated the five objectives of smart growth policy into indicators, collected data for these indicators, and compared changes in the cities over time.

Does Smart Growth Reduce "Dumb" Urban Growth?

In Chapter IV, I presented time series data for a variety of dependent variables under the following smart growth program goals (or objectives as I also refer to them): revitalization of central cities, control of development, creation and improvement of transportation options, protection of natural resources, and creation of equitable, desirable neighborhoods. Due to the broad nature of the goals, I narrowed my focus to a singular aspect of each, as will be presented below. I analyzed several indicators for each objective in order to determine if smart growth legislation was having the desired effects. I presented a detailed analysis of the data in Chapter IV, and I will now summarize those findings.

Health of Central Cities v. Suburbs

In order to compare the health of central cities versus suburbs for Baltimore, Atlanta, and Orlando, I chose three dependent variables to examine. These were population growth, segregation trends, and poverty trends. These indicators are important to the analysis because they represent central aspects of smart growth programs. If the programs enacted at the state and local levels were effective, I expected to see: (1) population growth in the central cities, or at least maintenance of the population status quo; (2) a decrease in the incidence of segregation in both the central city and suburbs; and (3) a decrease in the incidence of poverty in both the central city and suburbs (McMahon 1997, “Smart” 2001, “Sprawl Guide” 2000). Analysis revealed most desirable changes in Atlanta, followed by Orlando and then Baltimore.

Of the three cities, Atlanta yielded results most in accord with smart growth when quality of life variables were compared between central cities and suburbs for each of the metropolitan statistical areas. Analysis of population growth in Atlanta showed particularly encouraging results from a policy analysis standpoint. The central city of Atlanta lost residents each decade until after smart growth program inception. From 1990 to 2000 the central city experienced an increase of 22,457 people. Georgia’s smart growth legislation was enacted in 1989, immediately prior to the increase, so it may have been responsible for some degree of that change (Bureau of Census “State” 2004).

Analysis of data for Atlanta produced desirable findings for both segregation and poverty measures, as well. In terms of trends in segregation, one finding is that conditions did not worsen over time in the central city. The ratio of race populations remained essentially the same over time. In fact, conditions somewhat improved for blacks as they lost 5% of the total central city population in their flight to the suburbs. A second finding is that blacks have not been excluded from occupying the suburbs of Atlanta. While pockets of segregation in the suburbs certainly continue to exist, overall the rate of black population growth surpassed the rate of white population growth.

Georgia's smart growth legislation may be responsible for some of these changes. While these trends were evident prior to 1989, they became more evident after that year. For example, black population growth in the suburbs grew more quickly after 1989 than it did prior to that year (Bureau of Census "State" 2004).

Finally, smart growth policy in Georgia appears to have produced benefits in terms of the incidence of poverty in Atlanta. In the central city, total population living in poverty decreased from 27.3% to 24.4% after 1989. Atlanta's suburban population experienced an increase in poverty by a fraction of a percentage point from 1989 to 1999. While a continuation of the downward trend in the incidence of poverty in the suburbs prior to 1989 would have been most desirable, in light of the tremendous population boom in the suburbs of Atlanta over this time, a near-stabilization of the trend is probably a positive finding (Bureau of Census "State" 2004).

While Atlanta clearly showed the most desirable results overall for Objective #1, Orlando also showed improvement and may be rated as coming in "second place". Population trends observed for Orlando were remarkable in that the number of residents in both the suburbs and the central city steadily increased from 1970 through 2000. In the city, population rose from 98,965 people in 1970 to 185,951 people in 2000. While inner city population continued to increase after 1985, the year smart growth legislation was implemented in Florida; the increase may have been a continuation of the trend line, which clearly showed an increasing population from 1970 onward. In short, the trend in population described is desirable, but may or may not be attributable to Florida's smart growth legislation (Bureau of Census "State" 2004).

Orlando had mixed, yet encouraging results for the segregation variable analysis. After program inception in 1985, the white population was the only segment to lose members in the central city. Some degree of increased segregation is evident because as whites were moving out of the city, blacks and Hispanics were moving into the city. On the other hand, after 1985 both black and Hispanic populations experienced tremendous jumps in their suburban totals. This is a positive finding because it shows increased accessibility to suburban homes for both minority groups (Bureau of Census "State" 2004).

Lastly, it is interesting to note that Orlando scored poorly on the poverty trend analysis. Incidence of poverty in both city and suburbs of Orlando decreased by about 5% from 1969 to 1989. After smart growth legislation was enacted in 1985, however, the rate of poverty in both city and suburbs slightly increased. It rose .1% in the city and .7% in the suburbs. These figures appear to be negligible when viewed without the data for previous years. In light of the pre-test trends, however, it appears that Florida's smart growth legislation may have had a slightly undesirable impact on poverty rates. While the findings in terms of poverty are not good, this may in fact be a signal of increasing diversity and access to housing in Orlando, which is indicative of smart growth (Bureau of Census "State" 2004).

Baltimore, in contrast to both Atlanta and Orlando, showed primarily negative results for each of the three indicators. Two notes must be reiterated at this point before I review the findings. One is that Baltimore is an aging city that began its deterioration decades ago, when the industrial heart of the city was abandoned (City of Baltimore 2004, Cohen 2002, Rusk 1996). Even with a comprehensive smart growth plan at both the state and city level, I would expect a slow recovery for the city. The second point I must remind the reader of is that Baltimore's legislation was enacted in 1992 and 1997, making the second half of the program less than ten years old. While it is important to begin evaluation, outcomes may only recently be materializing (Bureau of Census "State" 2004).

Overall, Baltimore experienced loss of population in the inner city, mixed results in terms of segregation trends, and increased incidence of poverty. In terms of population trends, residents steadily vacated the central city from 1970 to 2000, while population in the suburbs grew. It appears that Maryland's smart growth legislation was not able to stop the population flight from the city as of the year 2000 (Bureau of Census "State" 2004).

Segregation trend data showed that both white and black populations have abandoned Baltimore's central city. On one hand, it is notable that blacks were less likely to leave the urban area than whites, as the segment's loss of population was significantly slower, and did not begin until 1990. This is likely indicative of economic hardship among central city blacks. On the other hand, it may be a positive finding in terms of smart growth that blacks were more able to leave the city if they wished during the decade Maryland's smart growth legislation was enacted. Further, it is a positive finding in terms of smart growth that numbers of blacks in Baltimore's suburbs have continued to grow (Bureau of Census "State" 2004).

Finally, results for Baltimore were undesirable for poverty trends as incidence of poverty increased in both the city and suburbs after program implementation. From 1989 to 1999, poverty grew in Baltimore's central city from 21.9% to 22.9% of total population, and in the suburbs from 4.7% to 5.2% of total population. Furthermore, tremendously higher poverty levels were recorded in the central city as compared with the suburbs in each decade (Bureau of Census "State" 2004).

Population Density

In order to evaluate the second objective of smart growth programs, control of development, I limited my analysis to population density. If smart growth initiatives were successful in the cities, I would expect to see: (1) an increase in population density, or the number of people per unit of land; and (2) a similar rate of growth between population and land area of each city (Danielson and Lang 1998, Mitchell 2001). Based on these indicators, Orlando fared best, followed by Baltimore, then Atlanta.

In terms of controlling development by increasing population density, Orlando clearly had the best results. Of the three cities, Orlando was the only one to have urban population increasing while population density was also increasing overall. Prior to adoption of smart growth legislation in 1985, the overall trend was undesirable, with a faster rate of growth in Orlando's land area than in its population. From 1980 to 2000, the trend reversed, and population growth in urbanized Orlando outpaced land area growth (Bureau of Census "Summary" 2004 and "State" 2004).

An examination of population density measures in Baltimore showed mixed, but promising, results. The positive finding in terms of smart growth is that during the decade smart growth legislation was enacted in Maryland, from 1990-2000, the rate of decrease in population density slowed in Baltimore. The rate was a loss of 168.6 people per square mile from 1980 to 1990, and then slowed to a loss of 148.7 people per square mile the following decade. Conversely, Maryland's legislation probably cannot be credited with the positive changes seen in expansion of land area. From 1970 to 1980, the physical size of the city grew by 68.8%, while population only grew by 11.1%. In the following two decades, the rate of growth in land area significantly slowed, to a 13.4% increase from 1980 to 1990 and a 15.2% increase thereafter. Maryland did not pass smart growth laws until the mid-1990s, indicating that positive changes after 1990 were probably a continuation of the trend line begun the previous decade (Bureau of Census "Summary" 2004 and "State" 2004).

Atlanta showed only vague improvement for this indicator over time, consuming a huge land area in relation to population over all. The city experienced a net decrease in population density over the 30-year period. There was some improvement, or increase in density, from 1980 to 1990, but after smart growth implementation in 1989, population density fell once again. In terms of growth in population versus landmass for Atlanta, results were unpredictable. From 1970 to 1980 growth in land area surpassed population growth, while during the next decade population growth was the greater of the two. Unfortunately, immediately after smart growth implementation in 1989, growth in land area once again surpassed population growth. While on the surface findings for Atlanta are discouraging for population density, there is reason for optimism. In light of the tremendous population growth in both the city and suburbs of Atlanta from 1990 to 2000, it may be true that Georgia's smart growth legislation kept the increase in land area from outpacing population growth at any higher rate (Bureau of Census "Summary" 2004 and "State" 2004).

Roadway Congestion

The third smart growth objective I considered was creation and improvement of transportation options. I focused my study on analysis of highway traffic congestion. I examined several dependent variables- a measure called the Roadway Congestion Index (RCI), costs associated with congestion, hours of traffic delay, and wasted fuel estimates. If smart growth programs were successful in the cities, I expected to find: (1) an RCI of less than 1.0, or at least a decrease in the index after legislation implementation; (2) a decrease in traffic congestion costs; (3) a decrease in traffic delay hours; and (4) a decrease in wasted fuel totals (Anderson and Tregoning 1998, Chapman 2000, Giuliano and Wachs 1993, Jeffords 2000). Examination of these indicators in the cities revealed most desirable trends in Orlando, followed by Baltimore, then Atlanta.

Florida's smart growth legislation appears to have had a positive impact on roadway congestion in Orlando. Orlando generally showed results similar to or better than "average" for other large cities. After the law's implementation in 1985, the RCI for Orlando nearly leveled off for a 10-year period at below the 1.0 level. In addition, the city's RCI was above average until 1993, although after that year it remained below the average for same size cities through the end of the study (Texas 2001).

Findings for the remainder of traffic congestion indicators in Orlando were somewhat surprising, and must be understood in light of the city's position as a major tourist destination (City of Orlando 2004). First, when residential population is accounted for, it appears that individuals in Orlando lost more money due to traffic congestion than what one would expect based on the city's RCI in 1998, 1999, and 2000. Second, Orlando showed an unsteady upward trend in traffic delay hours as well for each year except 1990. Third and last, after inception of statewide smart growth requirements in 1985, the annual amount of wasted fuel in Orlando continued to climb, yet remained below average for cities of similar size (Texas 2001).

While these results appear to be largely inconsistent with smart growth at first glance, such a conclusion would likely be incorrect. Highway traffic in Orlando is congested largely because of the huge tourist population, which is not factored into the city's population total. While the burden of crowded roadways is certainly evident in the city, the tourist population is clearly a confounding variable that is likely skewing these results (City of Orlando 2004, Jelic 2003).

Baltimore's roadway congestion trends analysis placed that city after Orlando, but clearly ahead of Atlanta when I ranked the three cities according to achievement of smart growth goals. Overall, results for Baltimore were fairly good. Analysis of Roadway Congestion Index for Baltimore revealed tentatively encouraging findings. After 1992, the first year of program implementation in Maryland, the RCI leveled off for only one year, remaining at .97 for 1993. If the legislation provided that benefit, it was indeed short-lived. On the other hand, after the second phase of the program was instituted in 1997, Baltimore's congestion index began to gradually fall below the average for similarly sized cities. While there was not actually a drop in Baltimore's RCI trend line after 1997, considering the city's crowded roadways, staying below the average RCI is a positive finding (Texas 2001).

There were two other findings of significant note for Baltimore. One was the dip in wasted gas totals from 1997 to 1999 and the second was the corresponding dip in yearly traffic delay hours. Wasted fuel totals had been gradually increasing in the city since about 1992. While the 1992 legislation was not effective, Glendening's program in 1997 may have been responsible for cutting the amount of wasted gasoline for several years. After 1997, total wasted fuel dropped from 69 million gallons to 64 million in 1998. The previous trend of increase returned in 1999 (Texas 2001).

The second noteworthy finding was a similar pattern seen in yearly traffic delay hours. Delay hours crept upward from 1992 to 1997, and then fell after that year. The data trend indicates that Maryland's 1997 legislation may have had a dramatic, if short-lived impact on both of these variables (Texas 2001).

Examination of the remaining variable for Baltimore produced mediocre results. In terms of per capita costs due to traffic congestion, the most desirable outcome, that of a decrease in costs, was not observed. Nor were traffic associated costs held constant. However, it is positive that cost totals for 1998, 1999, and 2000 were consistently below the average for same sized cities each of the three years (Texas 2001).

Traffic congestion measures in Baltimore did fall short of the ideal, although some progress is evident. While the 1992 legislation did not evidently have a significant or long-lasting affect on traffic congestion, the 1997 laws may have had a profound impact. Unfortunately the available data indicates a return to previous conditions in about 2000. Perhaps there will be more progress associated with the legislation in the years to come (Texas 2001).

Of the three cities, Atlanta consistently fared the most poorly for Objective #3 with skyrocketing traffic congestion, worsening delays, and wasted gasoline. Atlanta was the only test city to maintain a higher level of traffic congestion (RCI) than what was average for the same size cities in each year from 1982 through 2000. However, as was the case in Baltimore, some improvement was seen in Atlanta's RCI in the two years following Georgia's program adoption in 1989. After 1992, RCI resumed a pattern of escalation (Texas 2001).

Analysis of several of the other dependent variables also indicates the possibility of short-term improvement in Atlanta's traffic congestion following Georgia's smart growth legislation enactment in 1989. For example, congestion delay hours in Atlanta were above average before 1989. Not only was there a decrease in hours of delay from 1990 to 1991, but also delay hours in Atlanta dropped below average in 1990, 1991, and 1992. While the law may have initially produced the desired effect, unfortunately delay hours soared once again beginning just four years afterward (Texas 2001).

A similar pattern was seen in wasted fuel totals for Atlanta. After 1989, when the Georgia law was enacted, wasted fuel totals dropped slightly from 42 million gallons in 1990 to 41 million gallons in 1991. After 1991, however, the steady increase resumed. A drop in wasted fuel totals was seen once again 1999, but in the following year continued to spike upward (Texas 2001).

Lastly, data for annual traffic congestion costs in Atlanta were primarily discouraging in terms of smart growth. While there was a $45 decrease in annual per capita costs from 1998 to 1999, the figure grew by more than $100 per capita in the next year. Furthermore, cost in Atlanta have consistently been $150-$200 higher than average. This indicator seems to reinforce the severity of Atlanta's traffic conditions (Texas 2001).

Overall, little progress is evident as far as Georgia's smart growth legislation producing desirable results for traffic congestion in Atlanta. As described above, in several cases, a temporary improvement was seen in the two or three years immediately after 1989. Atlanta's reputation as a traffic "nightmare" is upheld (Bullard 2000, Texas 2001).

Air Quality

The fourth smart growth objective I considered was protection of natural resources. I chose air quality as the focus because of the critical impact it has on living systems of all types. I decided to examine air quality after the examination of population, population density, and traffic conditions, because each of these factors may affect quality of the air, as I discussed in Chapter IV (EPA "Air Quality" 2004, Switzer and Bryner 1998). I could then use results from those evaluations in interpreting the air quality data.

I chose two dependent variables as indicators of air quality in each city. The first was a comparison of EPA designated "good" and "unhealthy" air quality days. The second was an examination of trends in ozone levels and particulate matter. If state and local smart growth programs were successful, I expected to see: (1) good air quality days increasing as unhealthy days decreased; and (2) a decrease in the incidence of both ozone days and particulate matter days (EPA "Air Quality" 2004).

Based strictly on the data analysis, Orlando showed the most desirable results overall for the tests of air quality. The total number of "good" air quality days was highest in Orlando, and trends for ozone and particulate matter were generally on the decline. Baltimore and Atlanta, on the other hand, both showed significant reduction in days of ozone air pollution, yet overall air quality continued to deteriorate in both cities (EPA "AirData" 2004).

Results of the analysis presented in Chapter IV showed that on the surface Orlando had the best air quality for these measures, while both Baltimore and Atlanta had similar undesirable results, sharing the "second place" designation. Although the data suggests these conditions, I concluded that, in fact, Orlando is slowly losing the healthy quality of its air, while Baltimore and Atlanta have sacrificed some degree of healthy air in the short term to insure it in the long term (EPA "AirData" 2004).

My reasoning for these conclusions is based on a number of observations. In Baltimore and in Atlanta, the final few years of data indicate a gulf of separation between PM days that were high in totals and O_3 days that were low in totals (EPA "AirData" 2004). It is likely that the decrease in ozone days indicates better control over related pollutants, while the increase in PM days indicates construction, renovation, and rebuilding projects. I will remind the reader at this point that both of these cities have histories of hazardous levels of air pollution that led to EPA designations as "nonattainment areas". In both cases, significant measures have been taken to reduce the creation of ozone so that an acceptable rating by the EPA can be reinstated. In addition, the increase in particulate matter days in both of these cities is likely reflective of major construction efforts. Particulate matter is generated by debris being flung into the air, especially by pounding, drilling, sawing, and other actions employed by workers involved in construction (EPA "Air Quality" 2004). Smart growth programs often require many construction projects in order to, for example, update or restore downtown buildings, reclaim and "clean" old industrial sites, build affordable housing, improve existing housing, and demolish dilapidated buildings (Catlin 1997, Weitz 1999).

Trends seen in Orlando, however, are clearly undesirable in the long-term. Although quality of air in Orlando has remained high in comparison to Baltimore and Atlanta, and the EPA has not declared the city a "nonattainment" area, air quality has steadily declined in metropolitan Orlando over the 10-year period. In addition, totals for particulate matter days and ozone days in the city were similar to one another from 1999 to 2003 (as opposed to findings for Baltimore and Atlanta) (EPA "AirData" 2004, Jelic 2003). This means that I probably cannot attribute the city's deteriorating air quality to an increase in construction projects spurred by the desire to achieve smart growth. The results of this study indicate that Orlando does not have the motivation to immediately improve air quality that is associated with cities designated EPA nonattainment areas.

Housing Conditions

Finally, I examined housing conditions in Baltimore, Atlanta, and Orlando in order to evaluate the fifth smart growth objective of creating equitable, desirable neighborhoods. The condition and availability of housing is a critical component of smart growth program evaluation. As discussed in Chapter IV, housing is a basic part of one's total quality of life, associated with such factors as physical health and safety, equality, and financial well-being (Beaumont 1999, Burby and May 1997, Rusk 1993). I selected four indicators for evaluation- total available housing, median household rents, housing cost burden, and number of households with "any housing problems". If smart growth was occurring in the cities as a result of state and local programs, I expected to see: (1) an increase in available housing in both the city and suburbs; (2) stabilization of cost or increase in cost of rents; (3) a decrease in housing cost burden; and (4) a decrease in the number of households with housing problems (Anderson and Tregoning 1998, Katz and Bradley 1999, Walljasper 2001). Findings from the data analysis revealed most desirable results in Atlanta, followed closely by Orlando. Baltimore showed the least desirable results.

In Atlanta, there were positive findings for each housing variable except median rent costs, which showed mixed results. In terms of the number of available housing units, desirable increases in unit totals were observed for both inner city and suburbs after state legislation was implemented (Bureau of Census "State" 2004). However, housing improvement in the central city was impacted by preparation for the 1996 Olympics, which included construction of apartment homes as well as major demolition projects in substandard neighborhoods. Although it is impossible to distinguish between the impact of smart growth legislation and the impact of Olympic preparation during the 1990s, results are clearly in line with smart growth goals (Bullard 2000, City of Atlanta 2004).

In addition, there was progress evident in both the improvement of housing conditions and cost burden for residents in Atlanta. Overall trends from 1990-2000 included a decrease in the percentage of households with "any housing problems" and a decrease in housing cost burden for households with the lowest incomes (Bureau of Census "State" 2004).

The only mixed results for housing conditions in Atlanta were associated with the median cost of rents. An undesirable finding was that after smart growth legislation inception in 1989, the gulf between suburban and inner city rents remained wide. This indicates that households with low incomes remained less able to afford to move to the suburbs, where quality of life is generally better. On the other hand, a desirable finding is that median rent in the central city of Atlanta increased by about $50 after the smart growth program began in 1989 (Bureau of Census "State" 2004). This is probably a positive finding in light of the investment in developing quality affordable housing in the city after 1989 (including Olympic development). The increased rent in the inner city indicates that there is demand for that housing, and that the stock of housing is likely of sufficient quality to warrant the increase.

Results were also largely positive for Orlando, but did include some mixed findings for median rent costs and incidence of housing problems. In terms of available units of housing, it was desirable to see an increase in both urban and suburban units over the entire 30-year period. Unfortunately, I cannot state conclusively that Florida's smart growth program was responsible for this because data points after 1985 may be at least in part a continuation of the trend line during the "pretest" years (Bureau of Census "State" 2004).

Examination of trends in median costs of rent are mixed in terms of progress toward smart growth. One positive finding is that the 1985 Florida legislation appears to have narrowed the divide between city and suburb rents (until they became about the same in 2000). It is also positive that suburban rents have not continued to rapidly increase, as they did in earlier decades. On the other hand, for many who live in the city of Orlando, where average incomes are relatively low, housing is becoming less affordable (Bureau of Census "State" 2004, City of Orlando 2004).

Finally, trends in cost burden and housing "problems" in Orlando were also mixed. There was significant improvement in housing cost burden for the lowest income households in Orlando, those with less than or equal to 30% of median family income. At the same time, minorities in Orlando had a significantly higher incidence of housing problems in either of the years shown. The rapid expansion in population accounts for some of the disproportionate hardship seen for blacks and minorities. Nevertheless, it is alarming from a social equality standpoint to consider that about half of all black and Hispanic households in Orlando have some sort of housing problem (Bureau of Census "State" 2004).

The City of Baltimore, in contrast to Atlanta and Orlando, has shown minimal improvement in each of these categories. This is not surprising given the severity of the city's decline (City of Baltimore 2004, Knaap et al. 2003, Rusk 1996). The primary problem is that the central city of Baltimore lacks safe, affordable housing. Analysis of data reveals a gradual decline in available units in the city. While the city's effort with destruction of decrepit housing is a positive step, a net loss in total housing units is a critical concern for urban poor (Bureau of Census "State" 2004, City of Baltimore 2004).

In addition, from 1990 to 2000, the difference in price between rents in the city and suburbs grew rather than shrank. This is partially because rents in urban Baltimore have decreased since 1990. These findings are reflective of both the deterioration in the housing stock in the city and the continued flight of residents outward from the city. Cost of housing has decreased in part because housing stock is old, substandard, or unsafe (Bureau of Census "State" 2004, Knaap et al. 2003, Rusk 1996).

Finally, the incidence of "housing problems" increased for whites, blacks, and Hispanics while the trend in housing cost burden was improving over the ten-year period. As I mentioned above, rents have been decreasing in Baltimore, so the discovery of "improvement" for housing cost burden is no surprise. These two findings together are further indication of deterioration in housing stock in Baltimore (Bureau of Census "State" 2004).

Which Type Works Best?

Analysis of dependent variables reveals that the City of Orlando experienced the most desirable changes in terms of smart growth objectives after statewide legislation was adopted. In fact, Orlando showed the best results for three of five dependent variables. Those were: Objective #2, control of development; Objective #3, creation and improvement of transportation options; and Objective #4, protection of natural resources. Atlanta, Georgia had the most desirable results for the two remaining categories: Objective #1, central city revitalization; and Objective #5, creation of equitable, desirable neighborhoods. Based on these results, I make the preliminary inference that high coercion/comprehensive-general smart growth legislation, as it exists in Florida, is the most effective of the three types examined. In addition, medium coercion/ comprehensive-general smart growth legislation, as it exists in Georgia, is tentatively concluded to be the second most effective type.

Findings of this research imply that the more coercive a state's smart growth legislative program is, the more likely it will be effective at the local level. This is reinforced by the fact that not only was Florida's program most successful within this study, but Georgia's was second most successful. Maryland's program, which represented the low coercion/ comprehensive-general category, was not most effective for any of the five dependent variables examined. This conclusion is not surprising given that other authors reviewed within this study (Bollens 1992, Burby and May 1997, DeGrove 1990, Durant et al. 1993, Gale 1992) have found that local governments are most likely to develop and implement substantive, effective plans when they are mandated to do so by the state. Such is the case in Florida, where local governments are required to develop plans and submit those plans for state approval.

These findings are particularly of interest given that the trend for the last ten to 15 years has been for states to implement *less* coercive smart growth programs (Burby and May 1997, Durant et al. 1993, Freilich 1999, Gale 1992, Weitz 1999). As described in Chapter II, state growth planning programs have evolved over time. "First wave", or the earliest growth management legislation in states, generally included mandatory planning, a high degree of regulation, and a focus on environmental protection. Recent, or "second wave" legislation, has tended to be a more cooperative effort between state and local governments, with incentive features rather than penalties, and with a focus divided between concern for the environment and healthy economic growth (DeGrove and Metzger 1993, Freilich 1999, Weitz 1999). Indeed, as in the case of smart growth legislation in Maryland, local government compliance is generally voluntary in most recent programs (Bollens 1992).

If it is true that mandatory, highly regulated smart growth programs are most effective for achieving the objectives of smart growth, then state policy makers should consider these results carefully (Lindblom and Woodhouse 1993). Of course, smart growth legislation is molded in each state to reflect not only the needs of the people, as well as of the land and other resources; but also to reflect what is politically feasible (DeGrove 1990, Leo et al. 1998). As discussed in Chapter III, Governor Glendening was successful with implementation of Maryland's legislation because he crafted it in a way that he knew would be accepted by the legislature and the constituents. In order to make the program as widely accepted as possible, he put minimal hardship on local governments in terms of participation and rearranged funds rather than requesting additional ones (Cobb 1999, Cohen 2002). In short, it may be that even if highly coercive smart growth legislation is shown to be most effective, some states will have to choose between a less coercive program or no program, based on what is politically feasible.

Perhaps I am looking too far ahead, however. As I have stated throughout this work, these results are preliminary. Many more systematic studies will be needed to confirm or deny the finding that highly coercive, or "first wave" programs are most effective. In addition, the methodological concerns I outlined in Chapter IV still must be taken into account when considering these findings. While I was able to overcome or minimize the hazards associated with most of the methodological challenges, the decision to include only one city from each state does limit the external validity, or generalizability, of the results (Campbell and Stanley 1963). Each of the three cities utilized has characteristics and circumstances that make it unique. In the next section I will discuss not only how this project can be improved, but also some possible future directions for research in this area.

Avenues for Improvement

I must state once again that this is a preliminary study. I have been restricted to the analysis of data that was, firstly, obtainable, and secondly, collected for all three cities, in identical format, at the same points in time. In light of these limitations, there are numerous potential avenues for improving this research. One avenue would be to conduct this study again, using the same cities, but with more indicators for each of the five smart growth objectives. For example, in addition to air quality, water quality and soil quality measures could be interpreted to gain a more complete understanding of the condition of natural resources in the cities (assuming such measures were available for each city). Based on the incorporation of more variables, it would be interesting to see if Orlando, representative of high coercion/comprehensive-general type of legislation, was again found to be most successful.

A second improvement would be to consider more cities, or cases, in each state. Conclusions would be more likely to be generalizable if the *n* was increased to, say, twenty cities in each state. The major problem with increasing the number of cities, however, is that there may not be twenty cities in the same population category in each state. Or, data may simply not be available for them all. I discovered over the course of this research project that county and, of course, state level data is much more widely available than city level data. That is unfortunate for policy research of smart growth programs because such research necessitates the comparison of data for entire MSAs, central cities and suburbs, and urbanized areas.

Another avenue for improvement would be to include a state without smart growth legislation in the study. Doing so would provide a useful comparison case. It would be particularly telling if the non-smart growth city/cities performed as well as or better than the smart growth cities. The state of Alabama would be a good choice for selection because it is notable as one of the few states with no history of smart growth or related legislation and none on the horizon. It would also be a good choice from a methodological standpoint because it is located in the same area of the country as the other three states, thereby allowing for some control over political and social culture, climactic and geographic conditions.

Finally, the incorporation of attitudinal information might be useful. I limited my research to physical indicators at the exclusion of perceptual indicators. To clarify, a physical indicator of noise pollution would be the decibel level as registered by a meter near an airport. A perceptual indicator, on the other hand, would involve asking a resident of a neighborhood near an airport: "How loud is the airplane traffic on a 10-point scale?" (Green 2001). It would be interesting to survey citizens of each MSA in order to study the difference in perception of those living inside the city limits and those living in the suburbs. The attitudinal information collected could be used either to enhance or to compare with the physical indicators. Surveys could register opinions on the severity of various consequences of urban sprawl, such as loss of green space, traffic conditions, pollution, crime, and segregation. Responses could be broken-down for comparison by respondents' length of residency in the MSA, and place of residency as inner city, older/first ring suburb, newer/second ring suburb, or rural area.

Implications for Future Research

The study and evaluation of state smart growth legislation is ripe for academic inquiry. For nearly thirty years, the growth management trend in this country has been for an increasing number of states to assume some level of responsibility for local land use planning (Burby and May 1997, Freilich 1999, Weitz 1999). The time has come for systematic analysis of the effects of smart growth programs, as they continue to be implemented in a variety of forms. The ultimate goal of evaluation such as what is performed here is to determine whether or not smart growth programs produce some benefit for local communities.

Future research regarding smart growth legislation should be directed in at least two areas: a "nuts-and-bolts" analysis of the effectiveness of various types of state legislative programs, as I have done here; and secondly, scholarly inquiry into the legitimacy of those fundamental criticisms of smart growth programs I identified early in Chapter II. In the previous section I suggested several paths for future evaluative research, so I will now turn my attention to the criticisms mentioned above.

Two primary types of criticism are levied against smart growth programs. Some critics challenge the assumptions underlying the need for smart growth policies, arguing, for example, that urban sprawl is not a serious threat to farmland in the US. Other critics challenge the methods associated with achieving smart growth (Bishop and Tilley 2002, Gordon and Richardson 1998, Green 2001, Staley 2001). It is this second type of criticism that clearly requires attention in the form of future research.

The basic challenge to be addressed is the notion that the market economy itself will correct for all or most of the problems associated with unhealthy growth (Bishop and

Tilley 2002, Gordon and Richardson 1998, Staley 2001). These critics argue, in other words, that it is preferable for state governments to pass no smart growth legislation, but instead allow the system of capitalism work. Markets, they contend, are much more effective than governments at registering the preferences of individuals (Bishop and Tilley 2002, Gordon and Richardson 1998, Staley 2001). Some argue that government interference in areas such as land and transportation management not only disables the market economy's ability to respond to problems, but it may create new problems. Further, "...order can be produced without government planning. It is not that no one is planning; rather, everyone makes their own plans, and those plans are coordinated by market forces with the plans of everyone else" (Holcombe and Staley 2001, quoted p 10).

This type of theory should be tested in light of the tremendous resources spent by governments at the local, regional, and state level to assure healthy growth (Freilich 1999). It would indeed be a remarkable moment if it were discovered to be true that governments could redirect those resources elsewhere because the market alone would facilitate a responsible resolution. I do not think that would be the outcome. One only has to look to the coastline of the Atlantic to see how dangerous consumer preferences can be. When the shoreline is left unregulated, individuals will build at the edge of the sea, and rebuild in the same place after their homes are leveled by hurricanes (Catlin 1997, Liou and Dicker 1994, Switzer and Bryner 1998).

While it may be shown that a market-based solution may be inappropriate for extremely sensitive areas, such as coastlines and floodplains, would the same be true for land uses in less sensitive areas? This research question could be addressed by comparing conditions in communities without government regulation of growth to conditions in communities with government regulation. I have already suggested that a state such as Alabama presents an interesting test case because of its historic lack of land use or protection planning.

Clearly the research agenda for the subject of smart growth is a full one. The most important question is an enduring one and not easily answered: *How best to achieve smart growth?* Many more studies such as this one are required to reach an answer. In conclusion, I think the following quote provides a good summation of the driving force behind both smart growth initiatives and the need for related research:

> *"The prospect of everyone owning their own home evokes a nightmare image of endless single-family houses, apartment buildings, and condos sprawling over hill and dale, destroying farmland and forests, leading to increased car dependency, further fragmentation, excessive energy and resource consumption, and continued ecological damage. Neither the market nor the environment can support everyone in fulfilling this 'American Dream'" (Norwood and Smith 1995, quoted p 29).*

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APPENDIX I: TABLES

Table A-1: Racial Groups as Percent of Total Population in Central City v. Suburban Baltimore

	1980		1990		2000	
Race	**Central city (%)**	**Suburbs (%)**	**Central city (%)**	**Suburbs (%)**	**Central city (%)**	**Suburbs (%)**
White	44	89	39	86	31	79
Black	54	8	59	10	64	14
Hispanic	1	1	1	1	2	2
Other	1	2	1	2	3	5
Total	*100*	*100*	*100*	*100*	*100*	*100*

Source: Bureau of Census. *State of the Cities Data Set.* http://socds.huduser.org
Date note: Percentages are rounded to nearest whole number.

Table A-2: Racial Groups as Percent of Total Population in Central City v. Suburban Atlanta

	1980		1990		2000	
Race	**Central city (%)**	**Suburbs (%)**	**Central city (%)**	**Suburbs (%)**	**Central city (%)**	**Suburbs (%)**
White	32	84	30	77	31	63
Black	66	14	67	19	61	25
Hispanic	1	1	2	2	5	7
Other	1	1	1	2	3	5
Total	*100*	*100*	*100*	*100*	*100*	*100*

Source: Bureau of Census. *State of the Cities Data Set.* http://socds.huduser.org
Date note: Percentages are rounded to nearest whole number.

Table A-3: Racial Groups as Percent of Total Population in Central City v. Suburban Orlando

	1980		1990		2000	
Race	**Central city (%)**	**Suburbs (%)**	**Central city (%)**	**Suburbs (%)**	**Central city (%)**	**Suburbs (%)**
White	66	86	63	81	51	67
Black	30	10	27	9	26	12
Hispanic	4	3	9	8	18	16
Other	1	1	2	2	6	5
Total	*100*	*100*	*100*	*100*	*100*	*100*

Source: Bureau of Census. *State of the Cities Data Set*. http://socds.huduser.org
Date note: Percentages are rounded to nearest whole number.

APPENDIX II: FIGURES

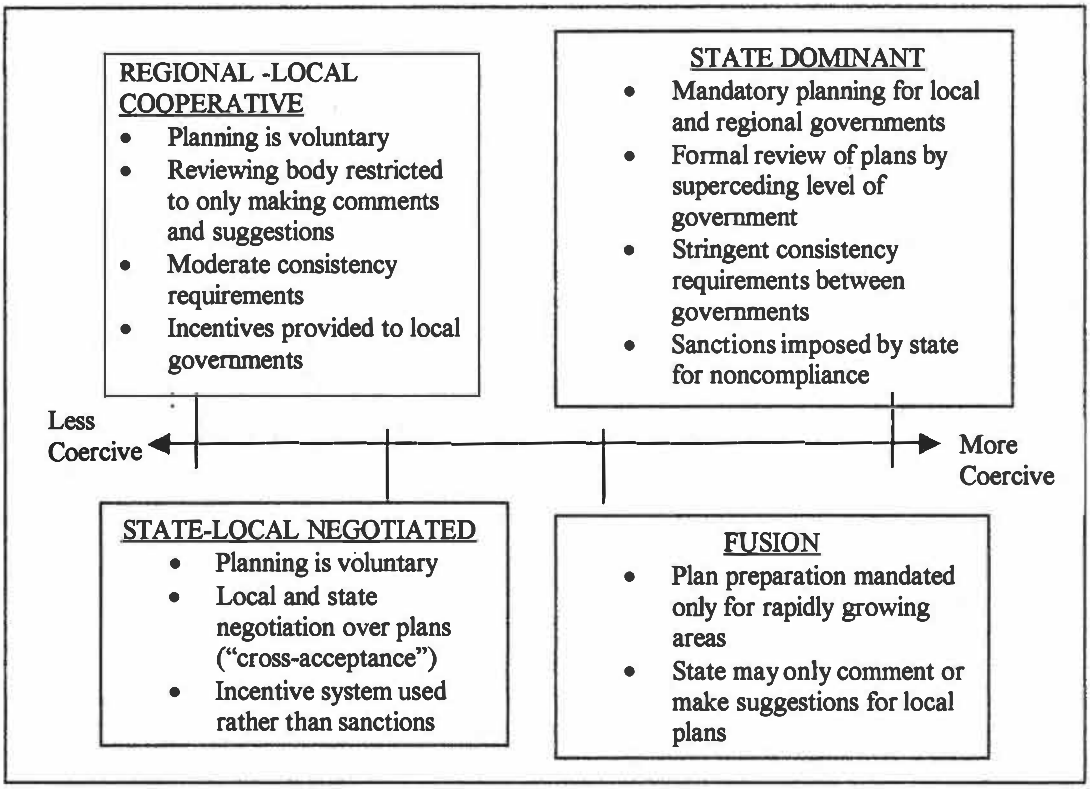


Figure A-1: The Gale Model
Source: Gale, Dennis E. 1992. "Eight State-Sponsored Growth Management Programs: A Comparative Analysis." *Journal of the American Planning Association.* 58, no. 4 (Autumn): 425-439.

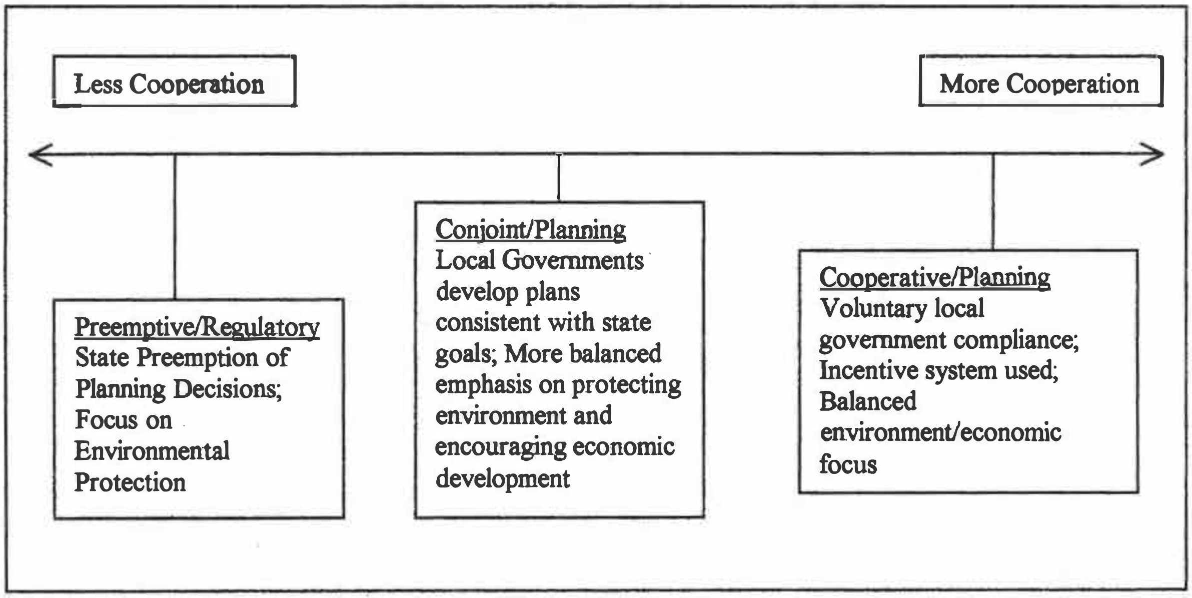


Figure A-2: The Bollens Model

Source: Bollens, Scott A. 1992. "State Growth Management: Intergovernmental Frameworks and Policy Objectives." *Journal of the American Planning Association.* 58, no. 4 (Autumn): 454-466.

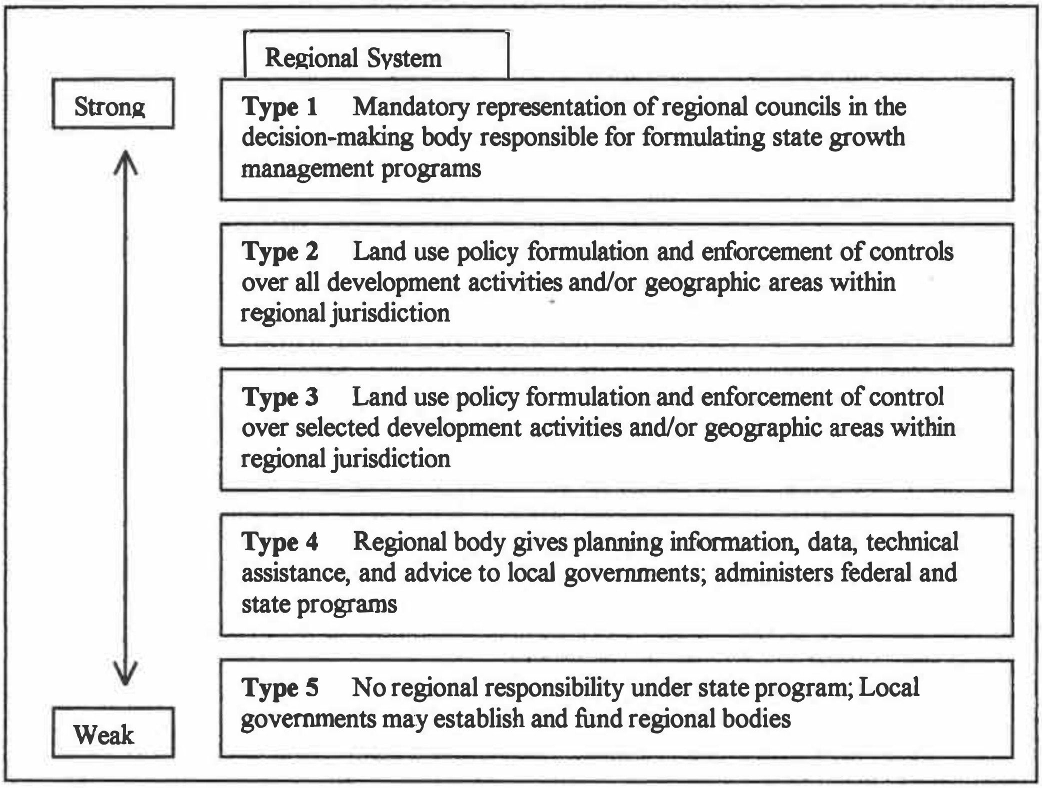


Figure A-3: The Ndubisi and Dyer Model

Source: Ndubisi, Forster and Mary Dyer. 1992. "The Role of Regional Entities in Formulating and Implementing Statewide Growth Policies." *State and Local Government Review.* 24 (Fall): 117-127.

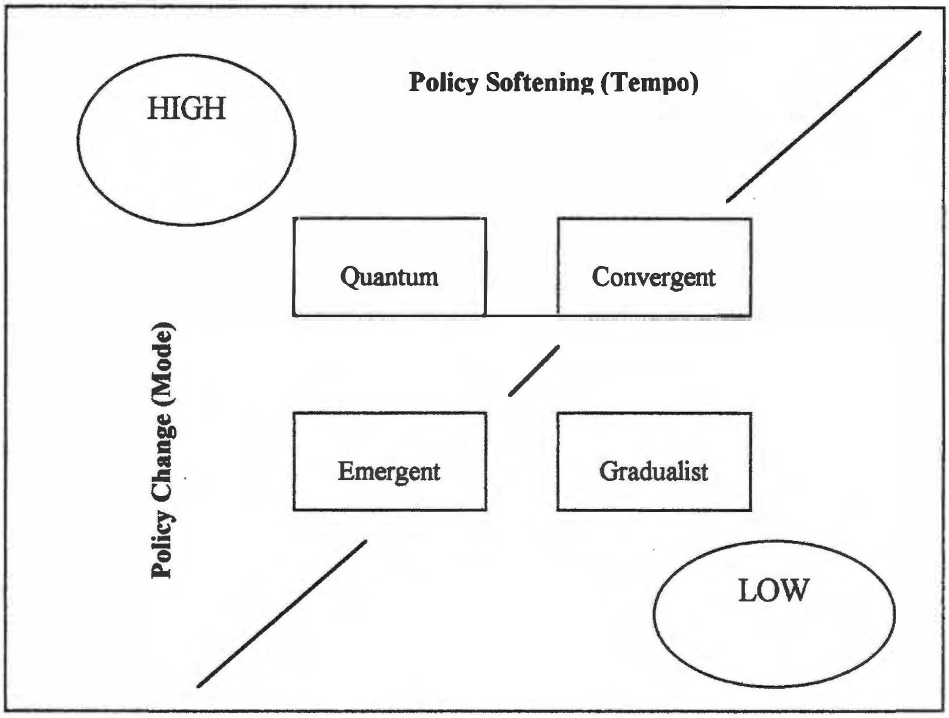


Figure A-4: The Durant, Thomas, and Haynes Model
Source: Durant, Robert F., Larry W. Thomas and Don Haynes. 1993. "The Politics of Growth Management Reform in the States: A Comparative Analysis. *Policy Studies Review.* 12, no. 3: 30-54.

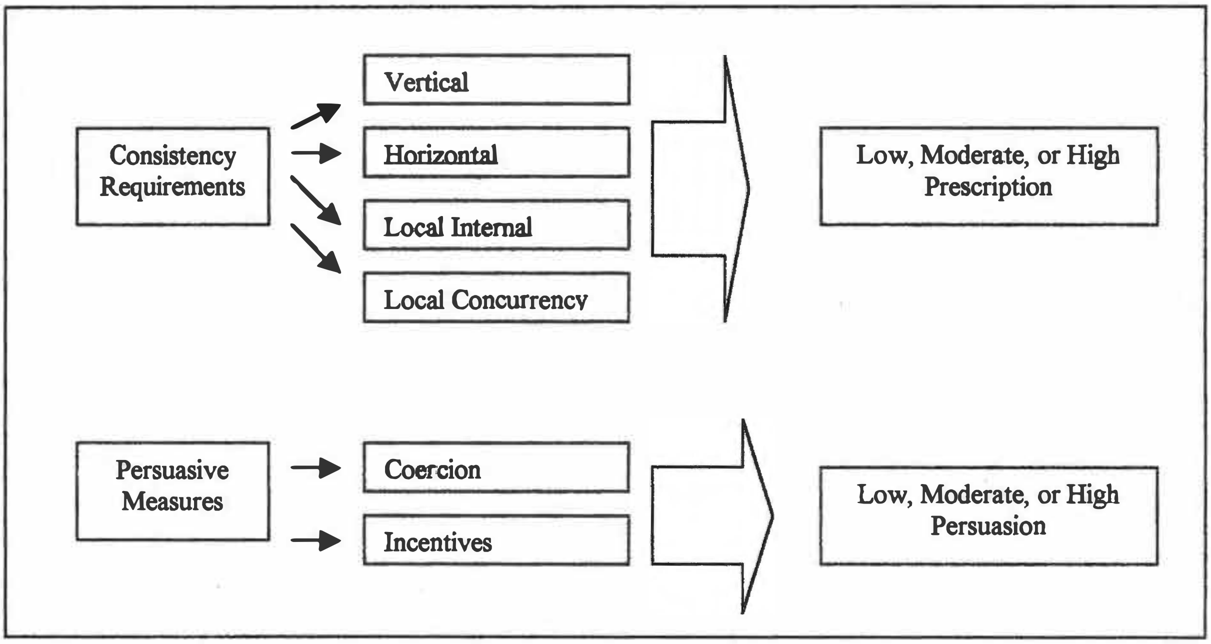


Figure A-5: The Burby and May Model
Source: Burby, Raymond J. and Peter J. May. 1997. *Making Governments Plan: State Experiments in Managing Land Use*. Baltimore: Johns Hopkins.

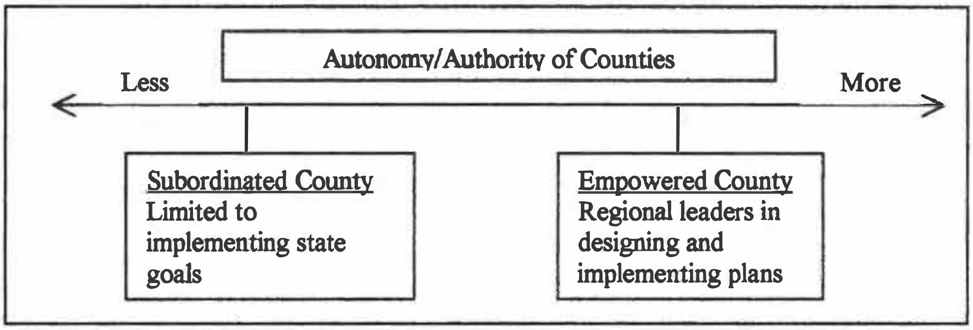


Figure A-6: The Bollens and Caves Model
Source: Bollens, Scott A. and Roger W. Caves. 1994. "Counties and Land-Use Regionalism: Models of Growth Governance." *International Journal of Public Administration.* 17, no. 5: 851-880.

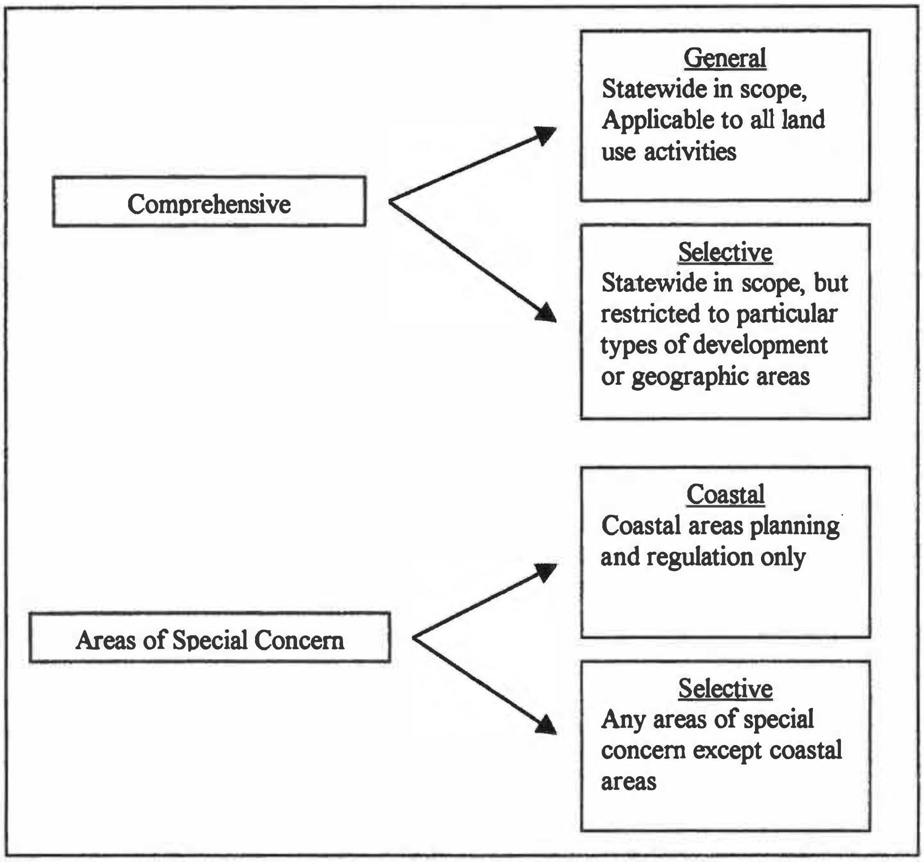


Figure A-7: The DeGrove and Stroud Model
Source: DeGrove, John M. and Nancy E. Stroud. 1987. "State Land Planning and Regulation: Innovative Roles in the 1980s and Beyond." *Land Use Law and Zoning Digest*. 39, no. 3: 3-8.

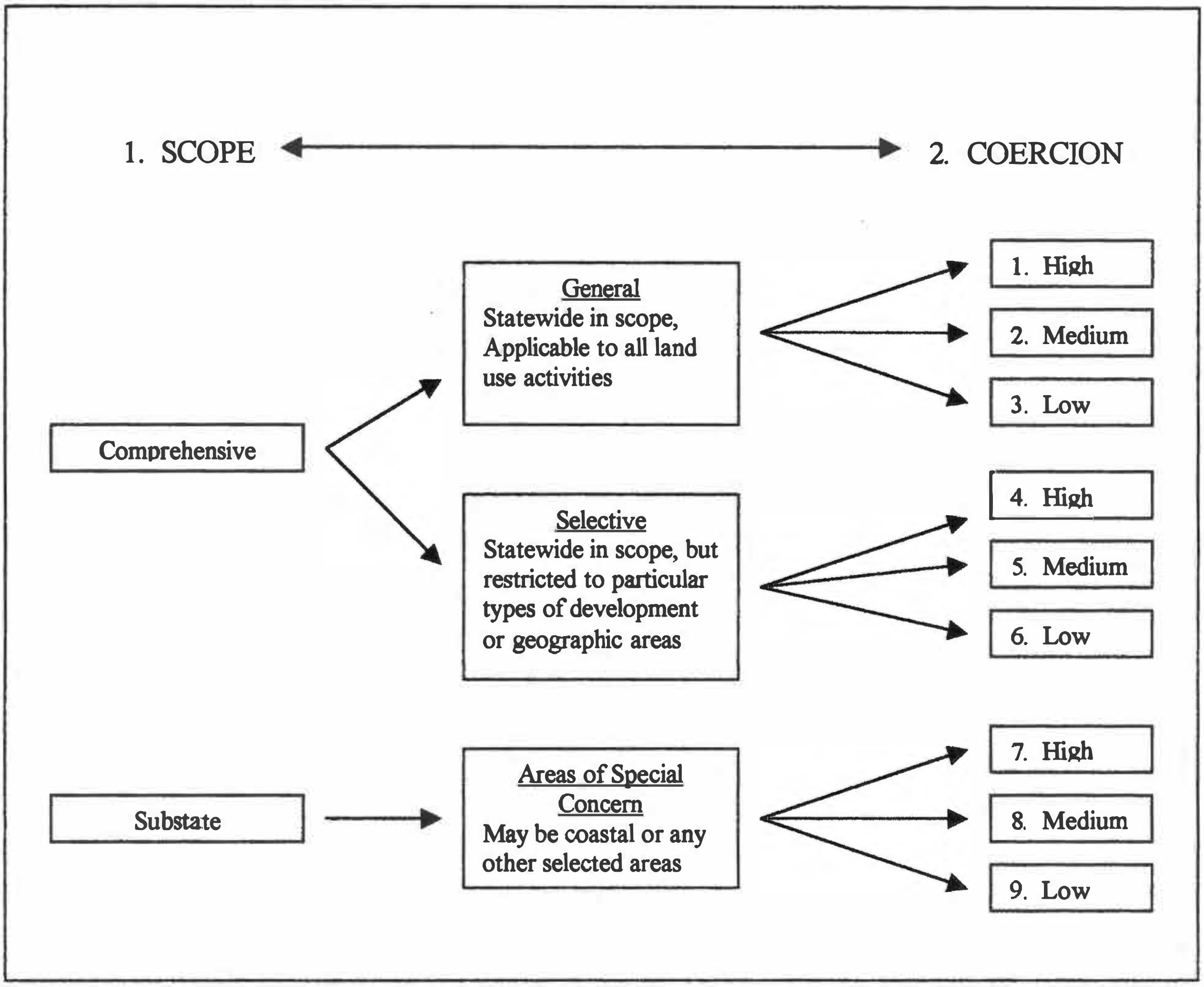


Figure A-8: The Proposed Model
Source: Compiled from-

DeGrove, John M. and Nancy E. Stroud. 1987. "State Land Planning and Regulation: Innovative Roles in the 1980s and Beyond." *Land Use Law and Zoning Digest.* 39, no. 3: 3-8.

Gale, Dennis E. 1992. "Eight State-Sponsored Growth Management Programs: A Comparative Analysis." *Journal of the American Planning Association.* 58, no. 4 (Autumn): 425-439.

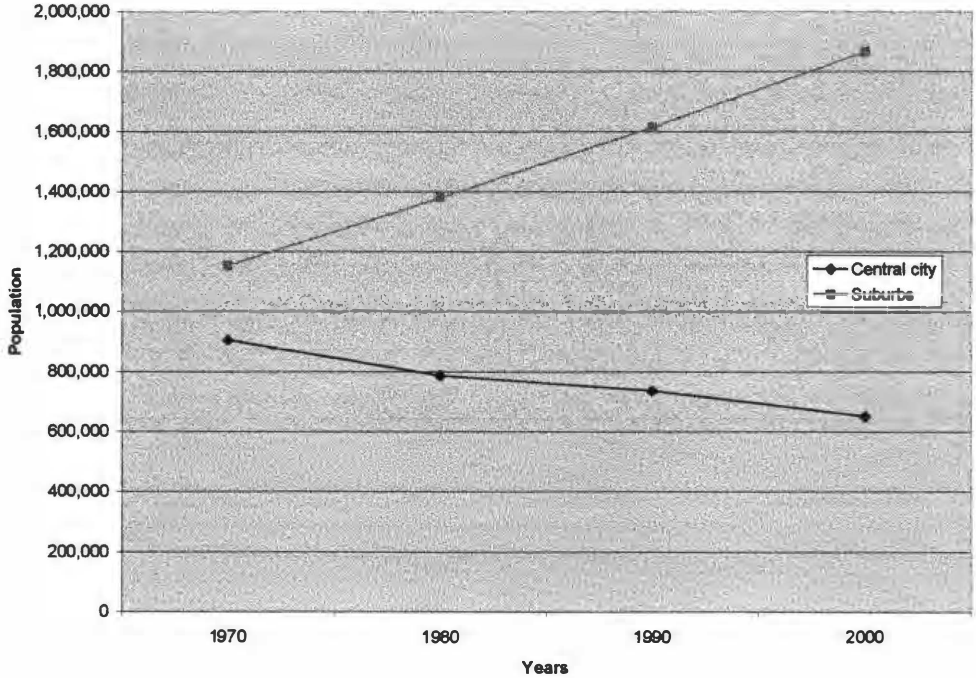


Figure A-9: Comparison of Population Growth Between City of Baltimore and Suburbs
Source: Bureau of Census. *State of the Cities Data Set.* http://socds.huduser.org

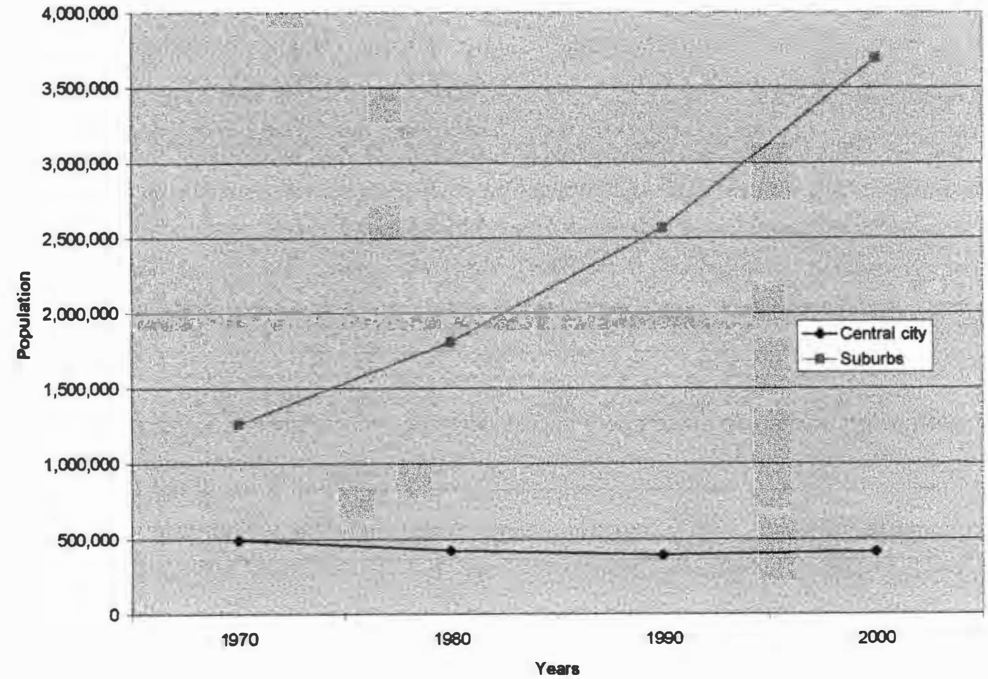


Figure A-10: Comparison of Population Growth Between City of Atlanta and Suburbs
Source: Bureau of Census. *State of the Cities Data Set.* http://socds.huduser.org

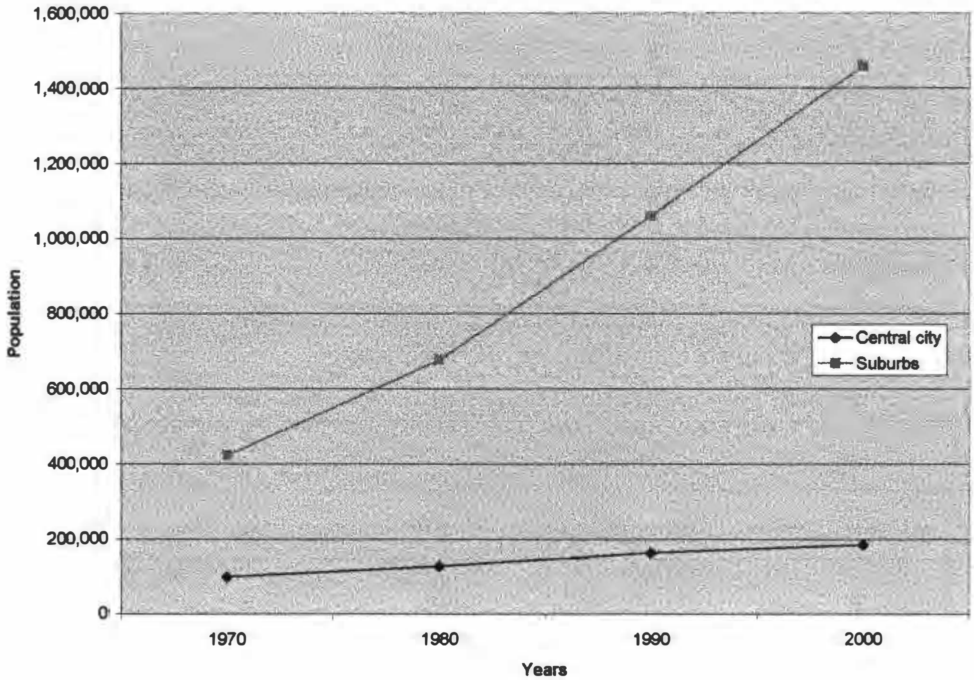


Figure A-11: Comparison of Population Growth Between City of Orlando and Suburbs
Source: Bureau of Census. *State of the Cities Data Set.* http://socds.huduser.org

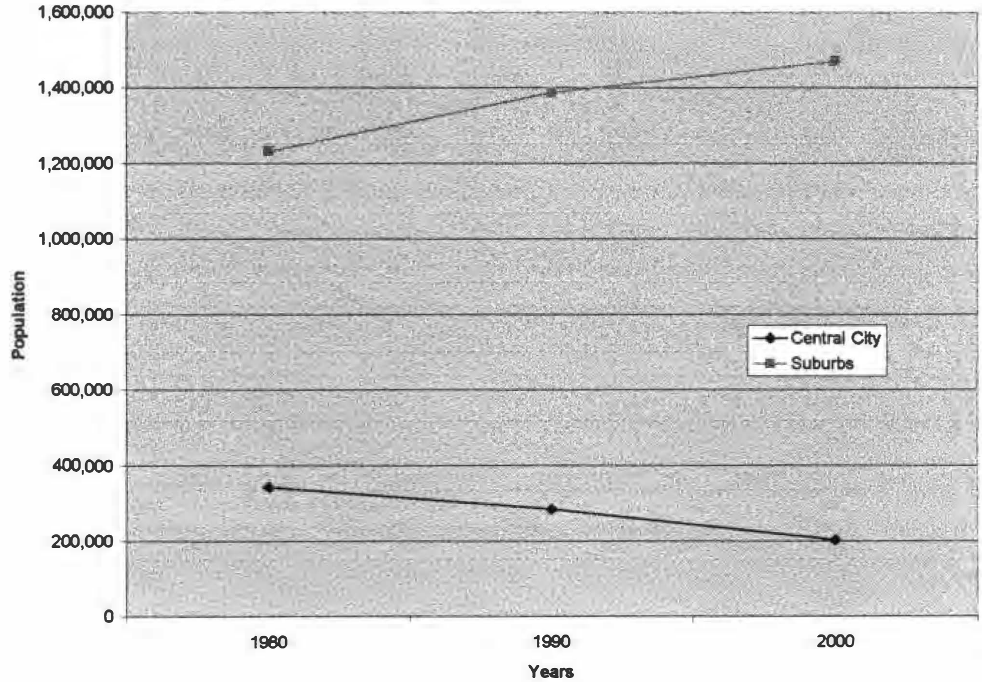


Figure A-12: White Population Trends in Baltimore
Source: Bureau of Census. *State of the Cities Data Set*. http://socds.huduser.org

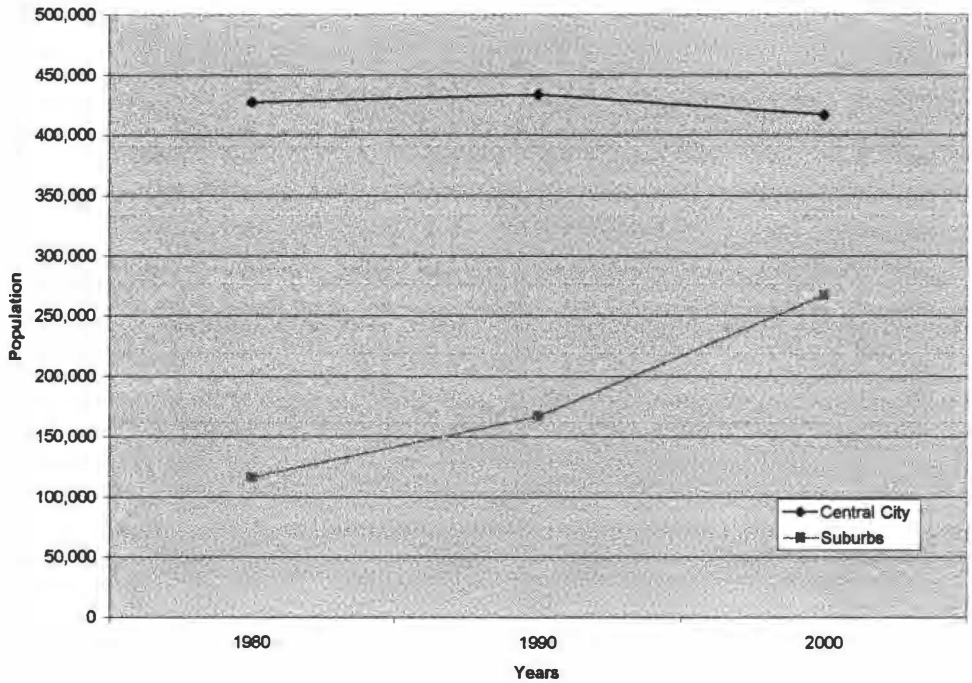


Figure A-13: Black Population Trends in Baltimore
Source: Bureau of Census. *State of the Cities Data Set*. http://socds.huduser.org

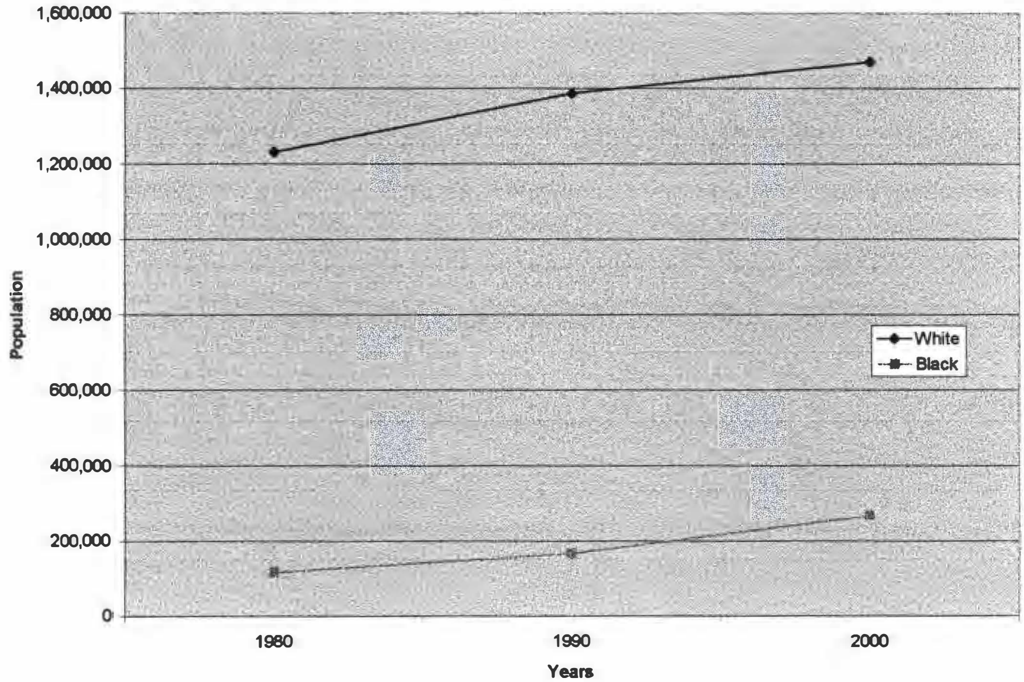


Figure A-14: Comparison of White and Black Populations in Suburban Baltimore
Source: Bureau of Census. *State of the Cities Data Set.* http://socds.huduser.org

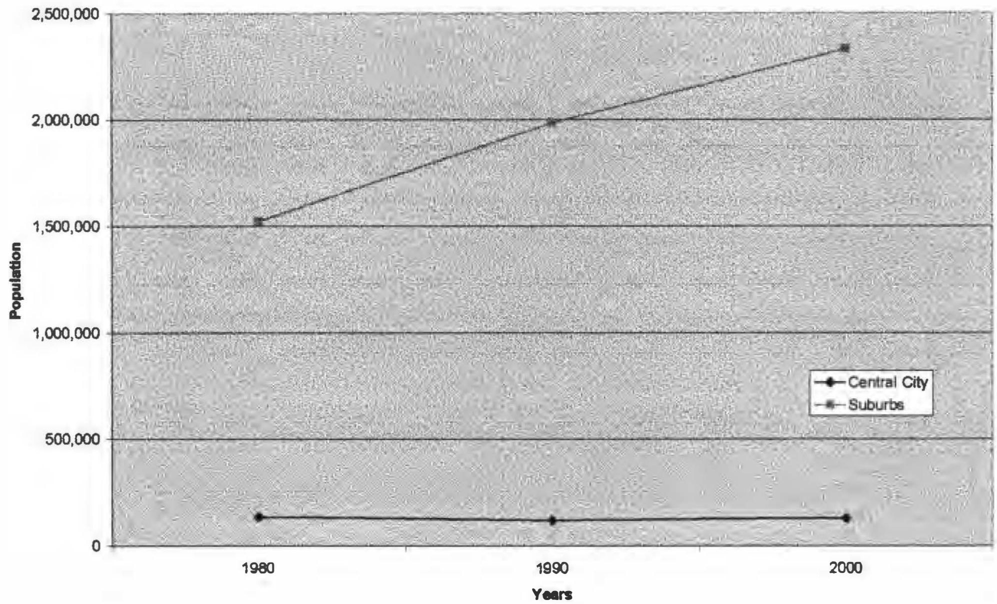
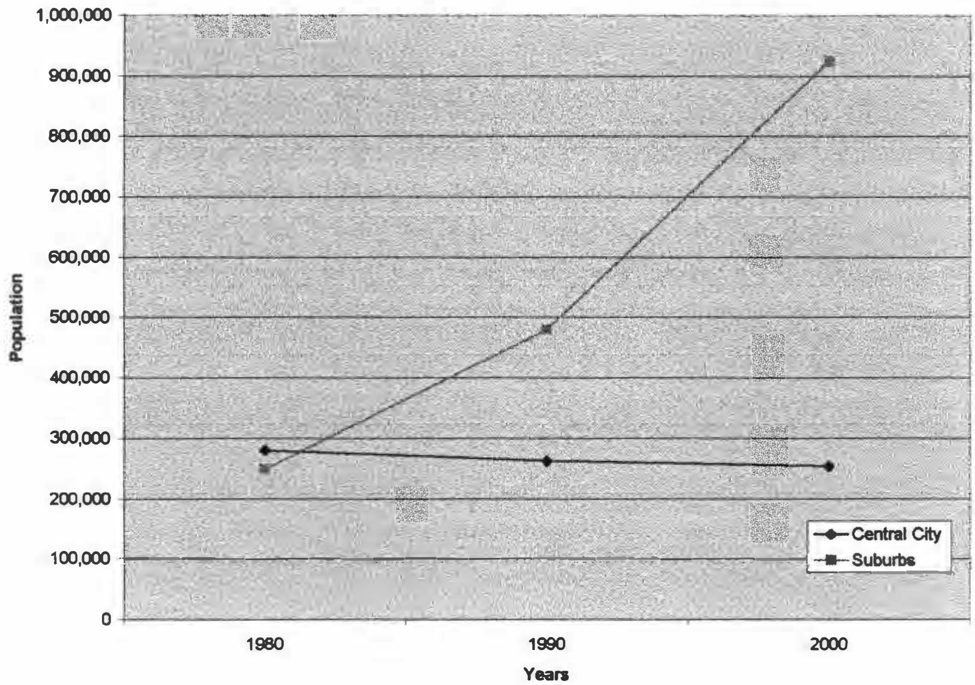


Figure A-15: White Population Trends in Atlanta
Source: Bureau of Census. *State of the Cities Data Set*. http://socds.huduser.org



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Source: Bureau of Census. *State of the Cities Data Set.* http://socds.huduser.org

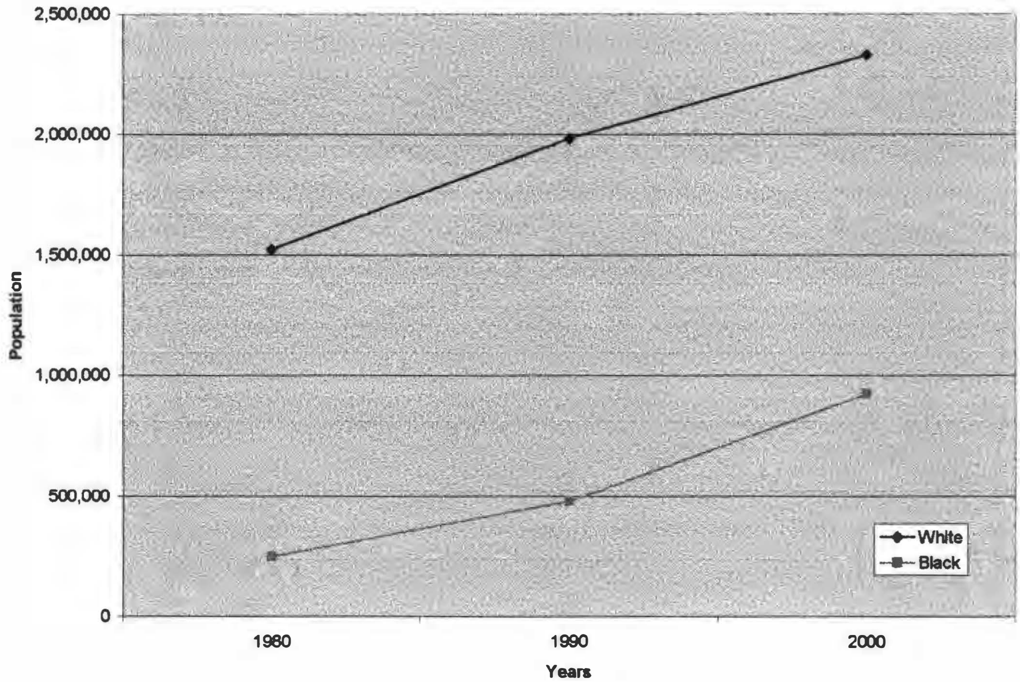

Figure A-17: Comparison of White and Black Populations in Suburban Atlanta
Source: Bureau of Census. *State of the Cities Data Set*. http://socds.huduser.org

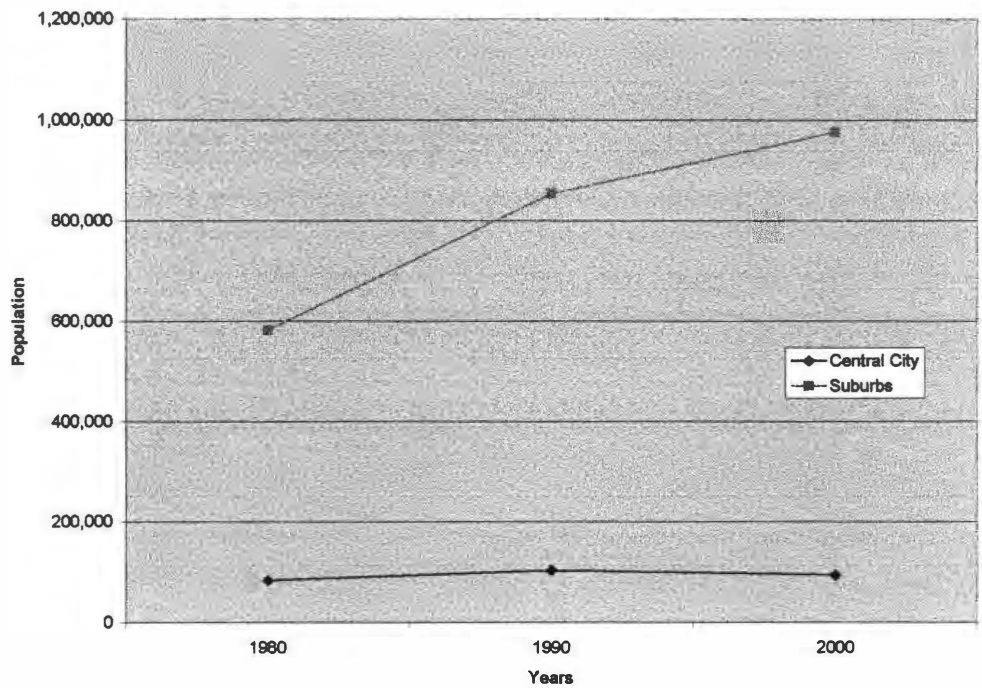

Figure A-18: White Population Trends in Orlando
Source: Bureau of Census. *State of the Cities Data Set*. http://socds.huduser.org

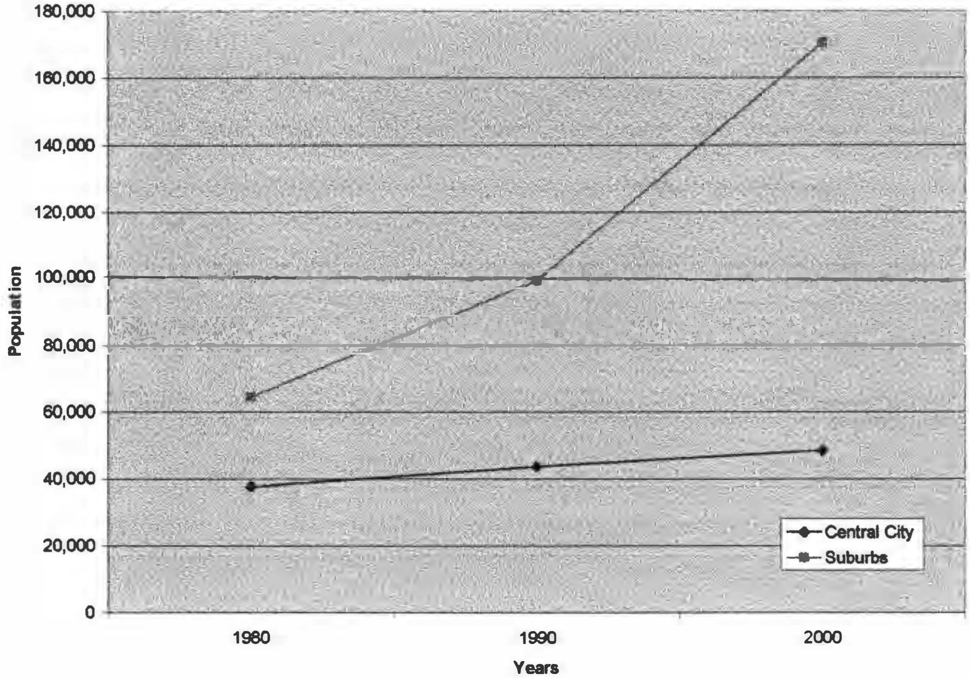

Figure A-19: Black Population Trends in Orlando
Source: Bureau of Census. *State of the Cities Data Set*. http://socds.huduser.org

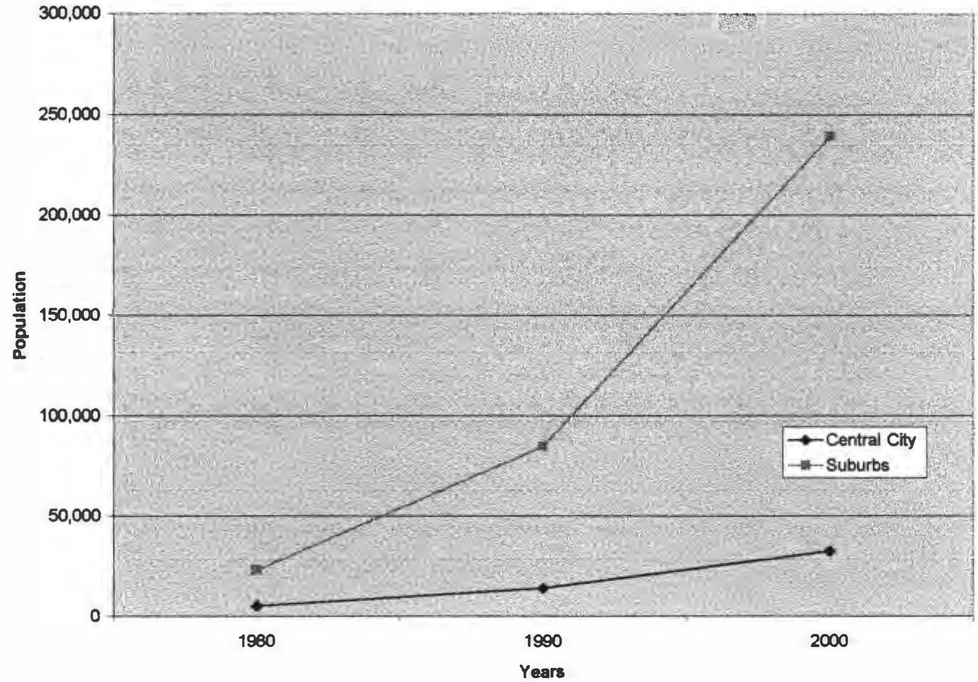

Figure A-20: Hispanic Population Trends in Orlando
Source: Bureau of Census. *State of the Cities Data Set.* http://socds.huduser.org

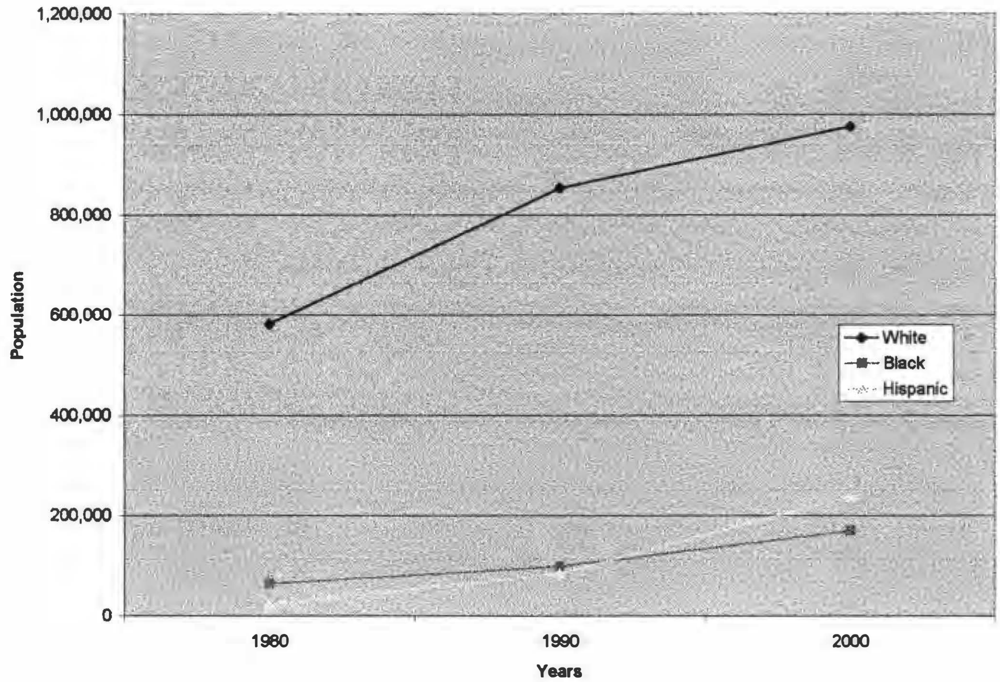

Figure A-21: Comparison of White, Black, and Hispanic Populations in Suburban Orlando

Source: Bureau of Census. *State of the Cities Data Set*. http://socds.huduser.org

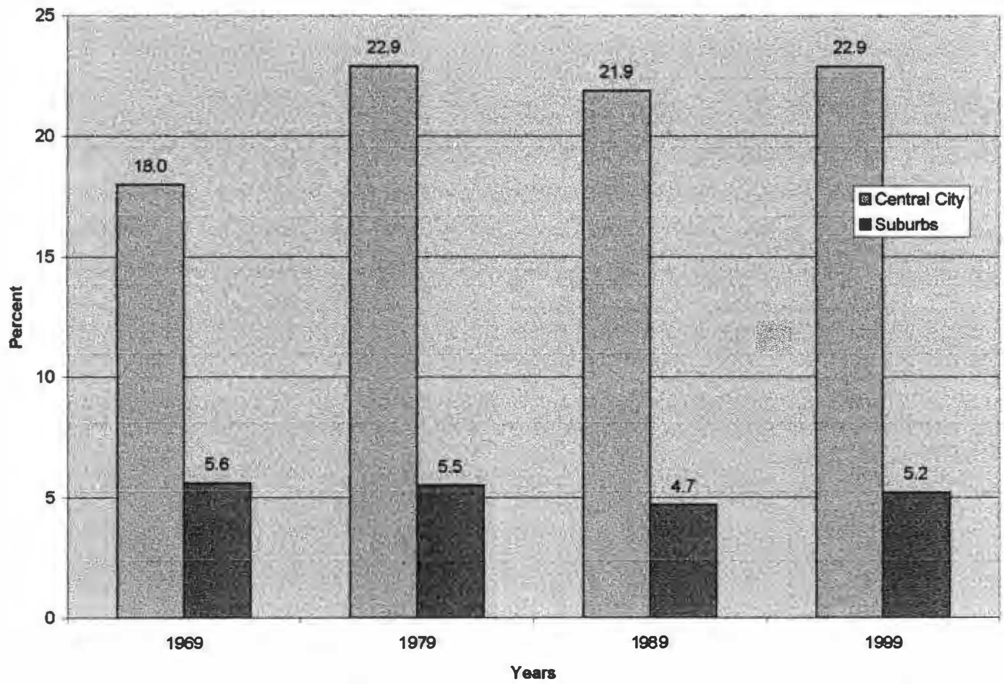

Figure A-22: Percentage of Population Living in Poverty Over Time in Baltimore
Source: Bureau of Census. *State of the Cities Data Set*. http://socds.huduser.org

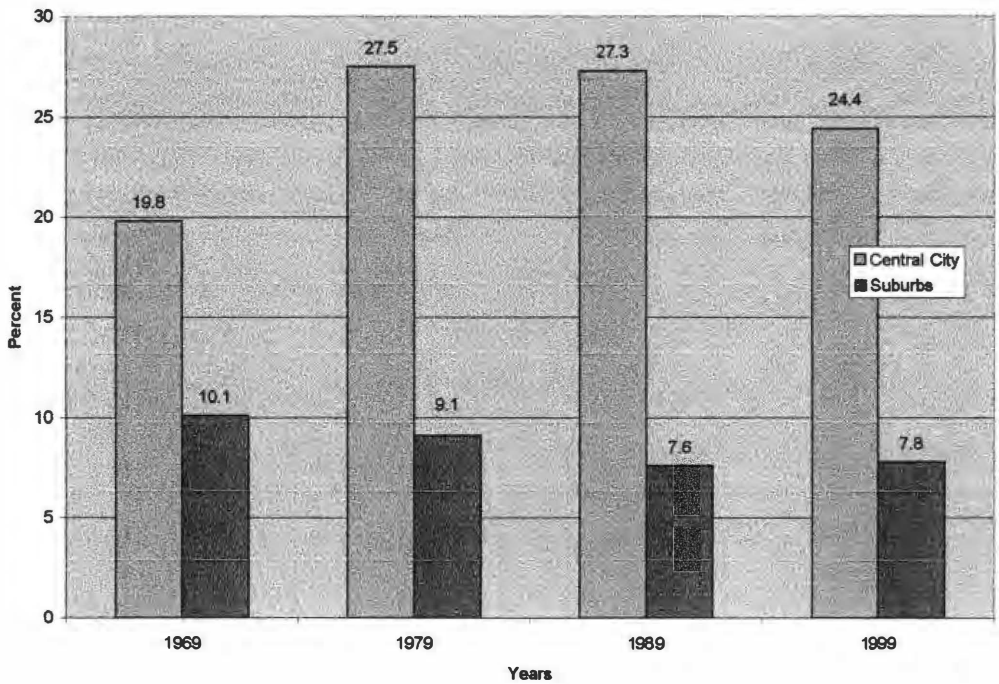

Figure A-23: Percentage of Population Living in Poverty Over Time in Atlanta
Source: Bureau of Census. *State of the Cities Data Set.* http://socds.huduser.org

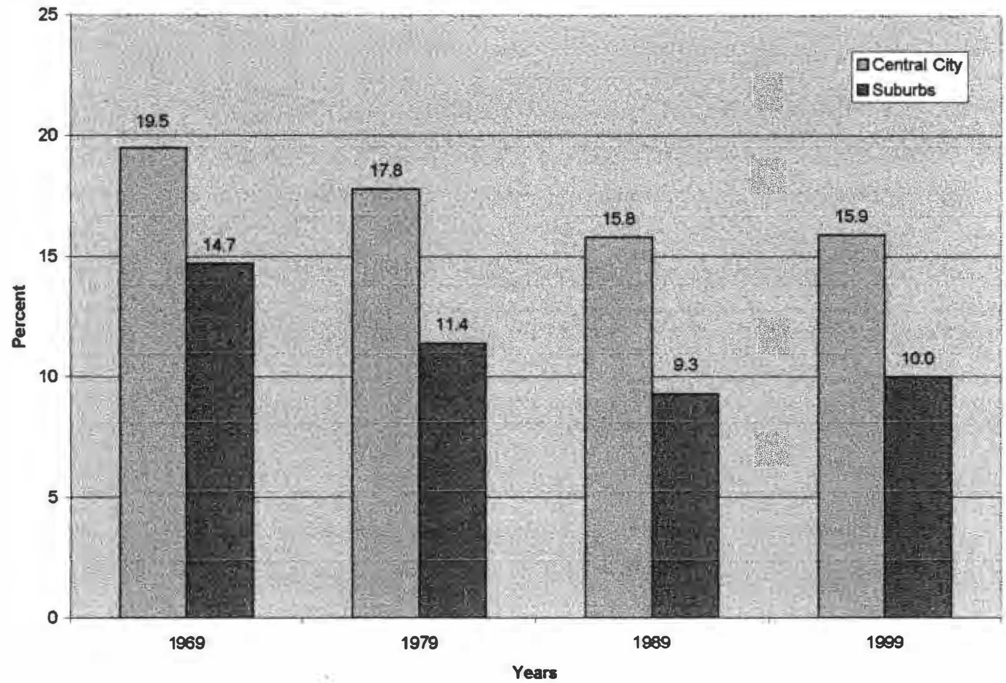

Figure A-24: Percentage of Population Living in Poverty Over Time in Orlando
Source: Bureau of Census. *State of the Cities Data Set.* http://socds.huduser.org

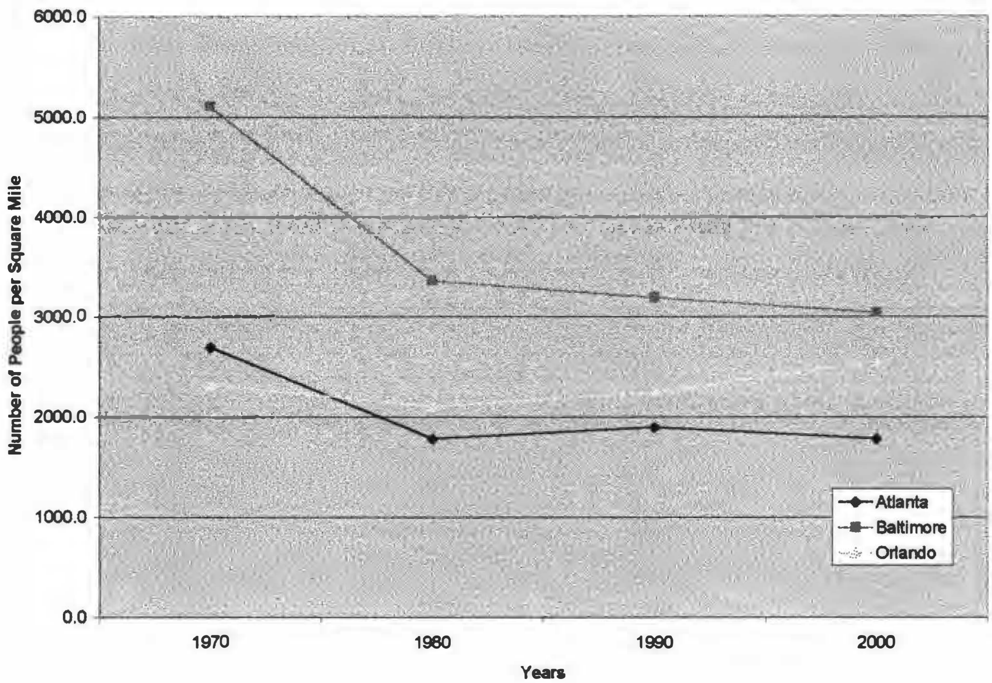

Figure A-25: Comparison of Change in Population Density Over Time
Source: Bureau of Census. *Summary Files*. http://factfinder.census.gov.

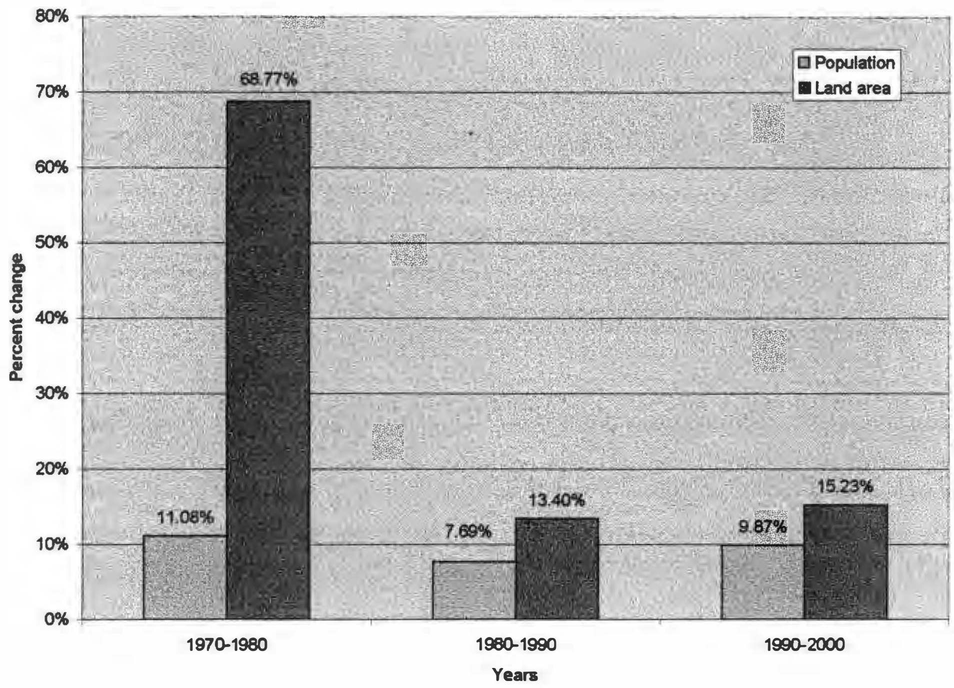

Figure A-26: Comparison of Rate of Change Between Population and Land Area for Urbanized Baltimore
Source: Bureau of Census. *Summary Files.* http://factfinder.census.gov.

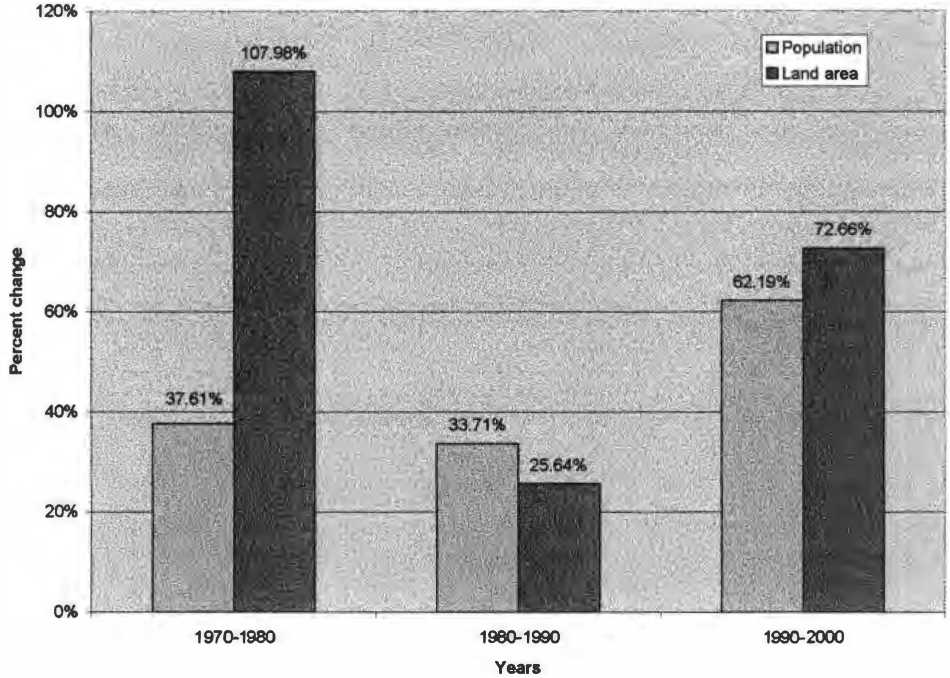

Figure A-27: Comparison of Rate of Change Between Population and Land Area for Urbanized Atlanta

Source: Bureau of Census. *Summary Files.* http://factfinder.census.gov.

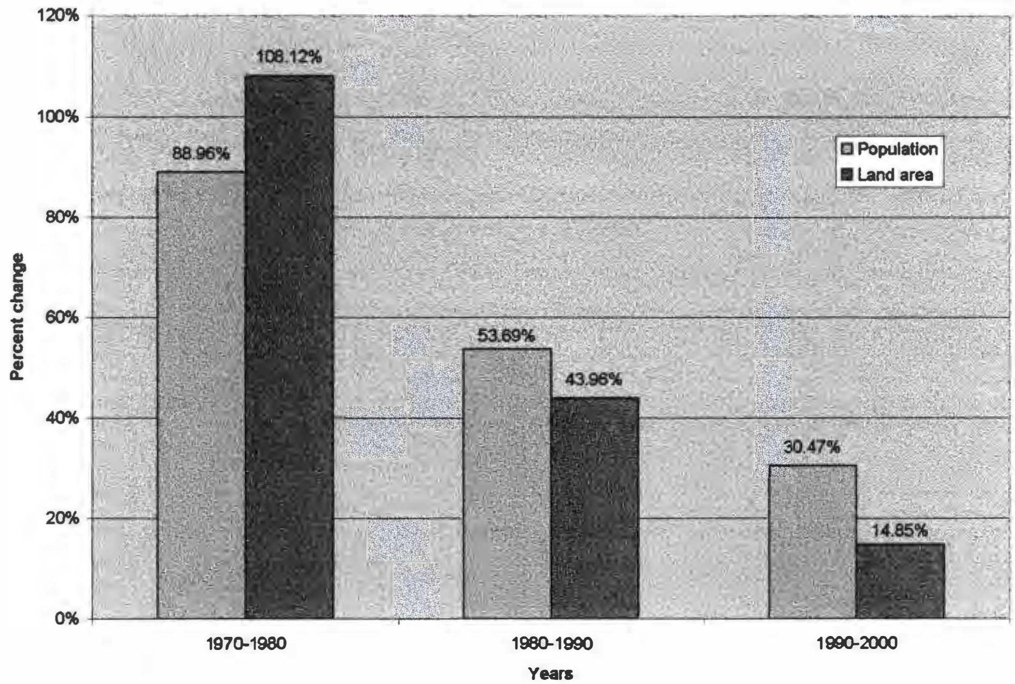

Figure A-28: Comparison of Rate of Change Between Population and Land Area for Urbanized Orlando
Source: Bureau of Census. *Summary Files.* http://factfinder.census.gov.

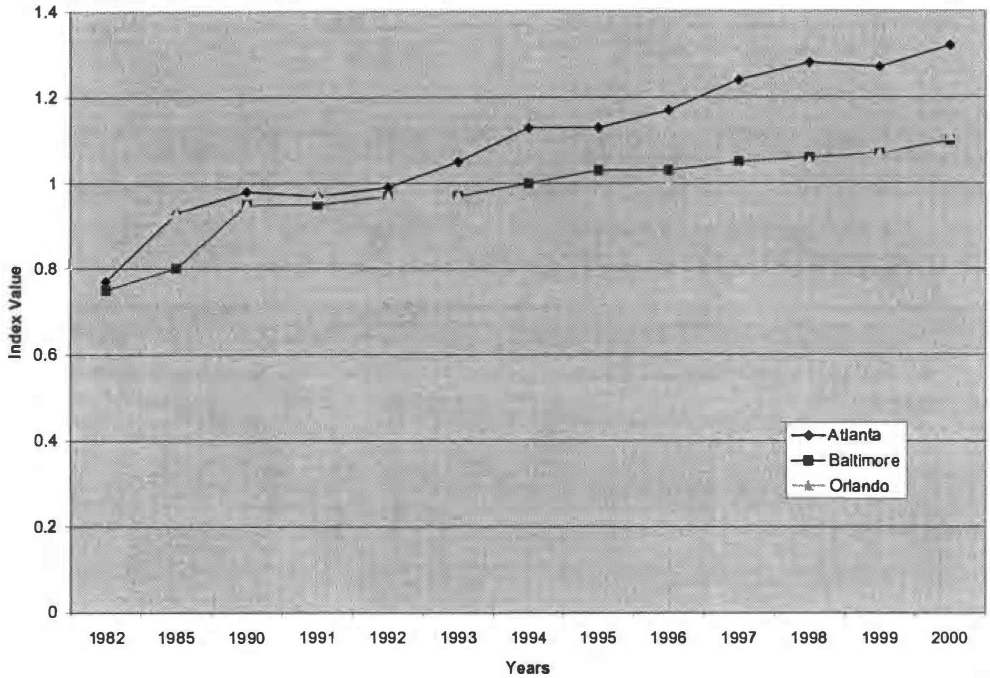

Figure A-29: Trends in Roadway Congestion Index for Baltimore, Atlanta, and Orlando
Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

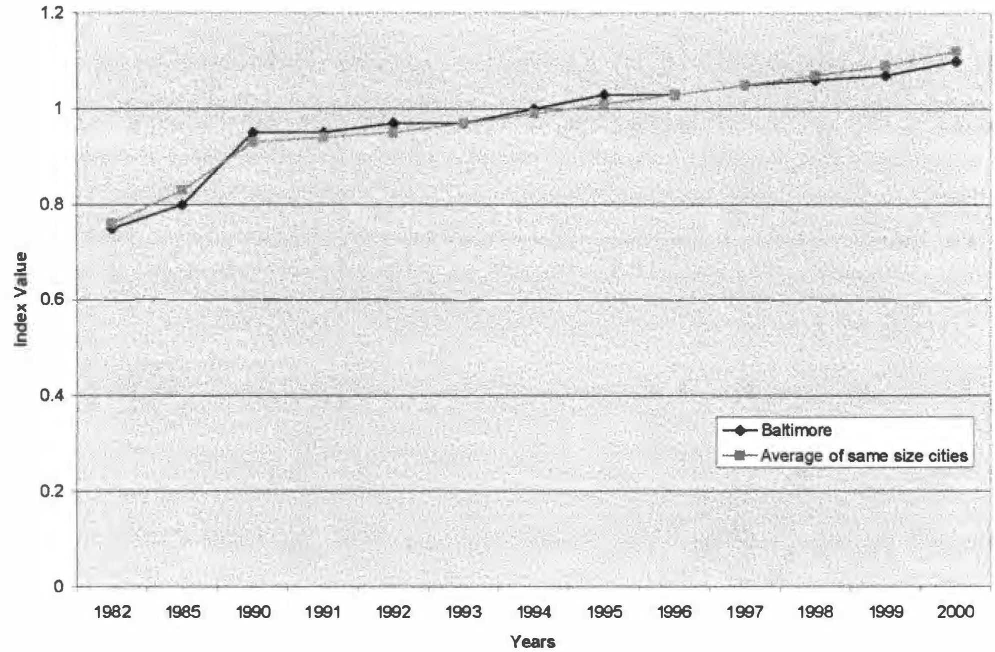

Figure A-30: Comparison of Trends in Roadway Congestion Index Between Baltimore and Average of Large Cities
Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

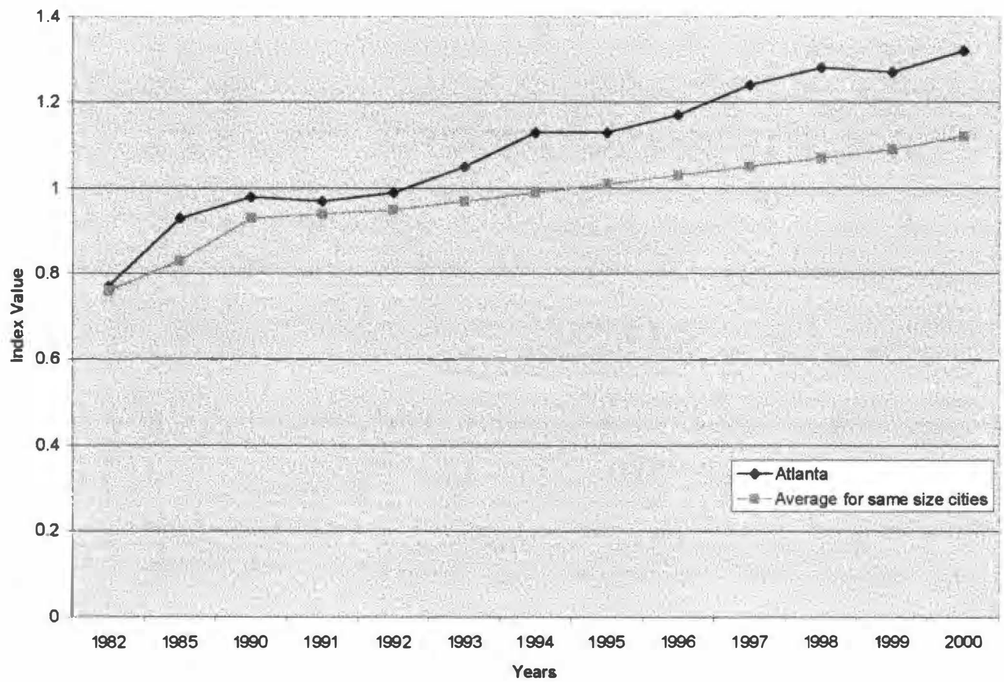

Figure A-31: Comparison of Trends in Roadway Congestion Index Between Atlanta and Average for Large Cities
Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

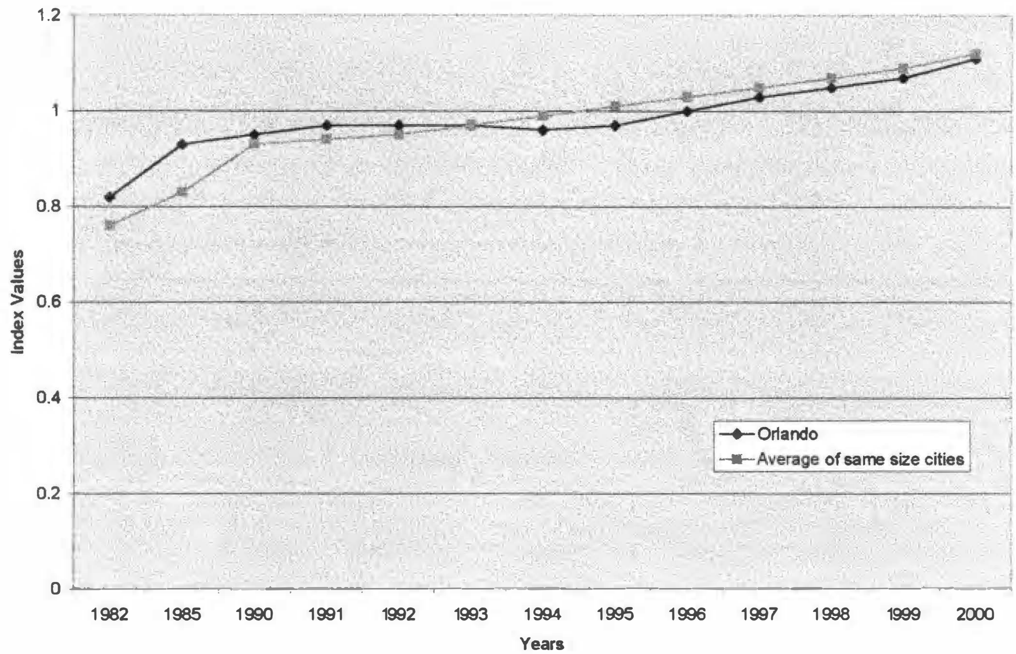

Figure A-32: Comparison of Trends in Roadway Congestion Index Between Orlando and Average of Large Cities

Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

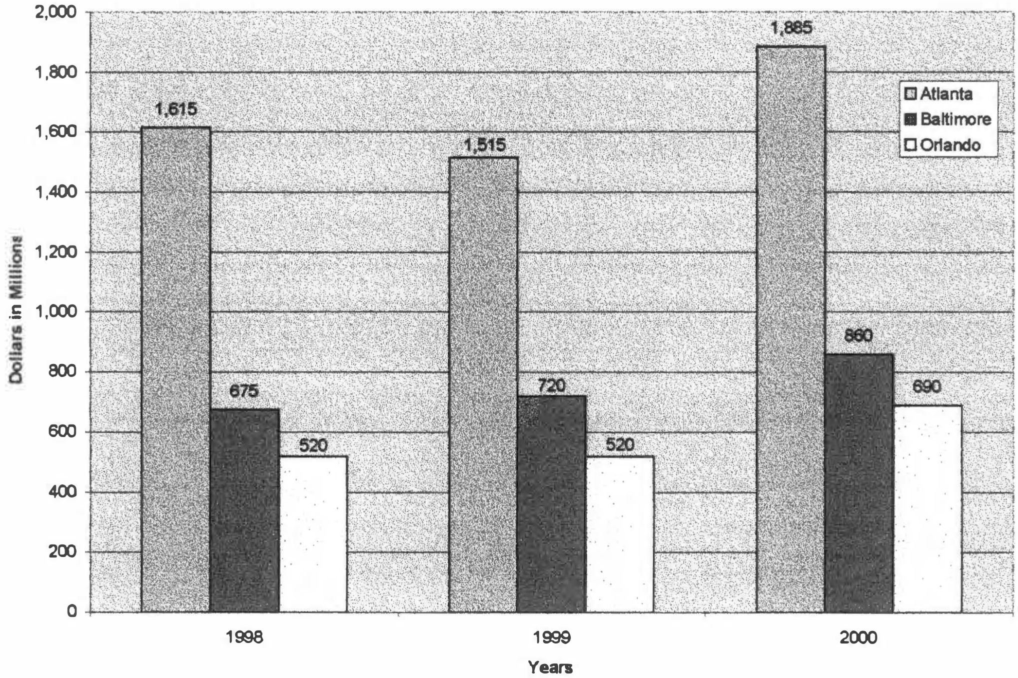

Figure A-33: Trends in Annual Traffic Congestion Costs ($ Millions)
Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

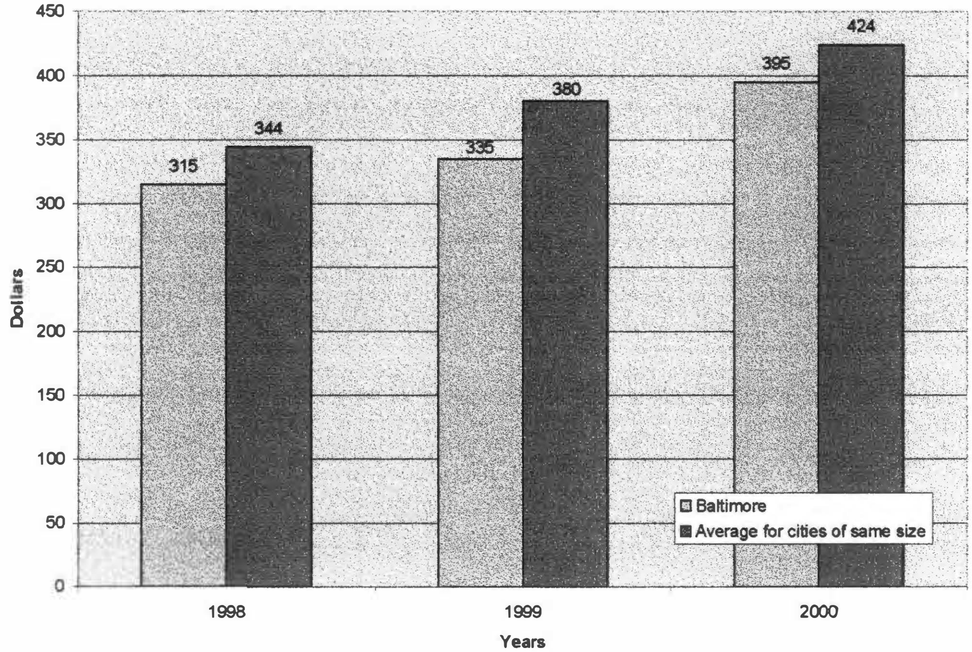

Figure A-34: Comparison of Trends in Annual Traffic Congestion Costs Per Capita Between Baltimore and Average for Large Cities
Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

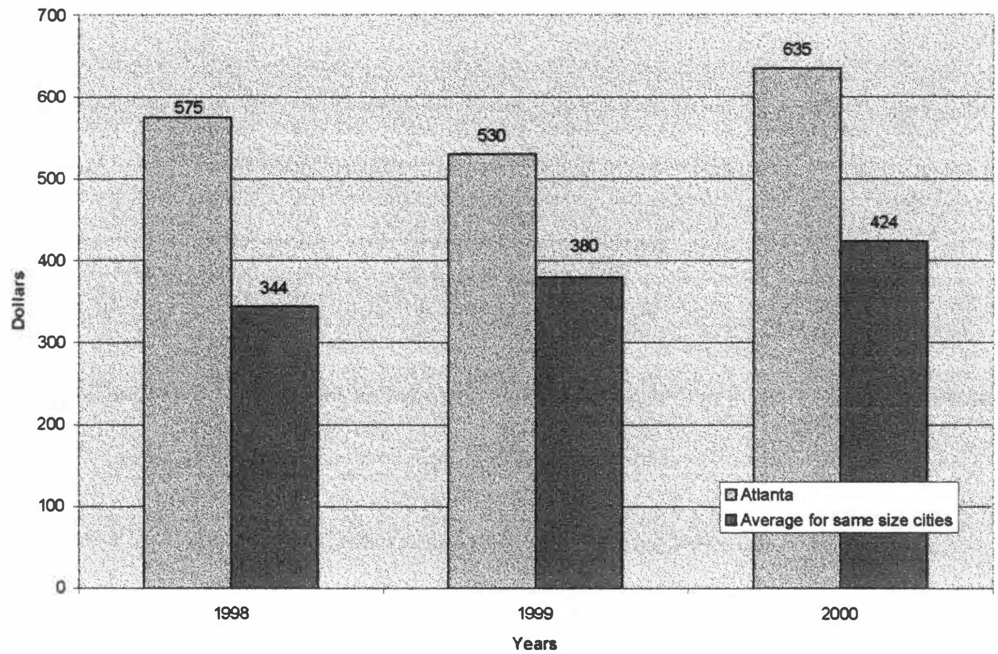

Figure A-35: Comparison of Trends in Annual Traffic Congestion Costs Per Capita Between Atlanta and Average for Large Cities
Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

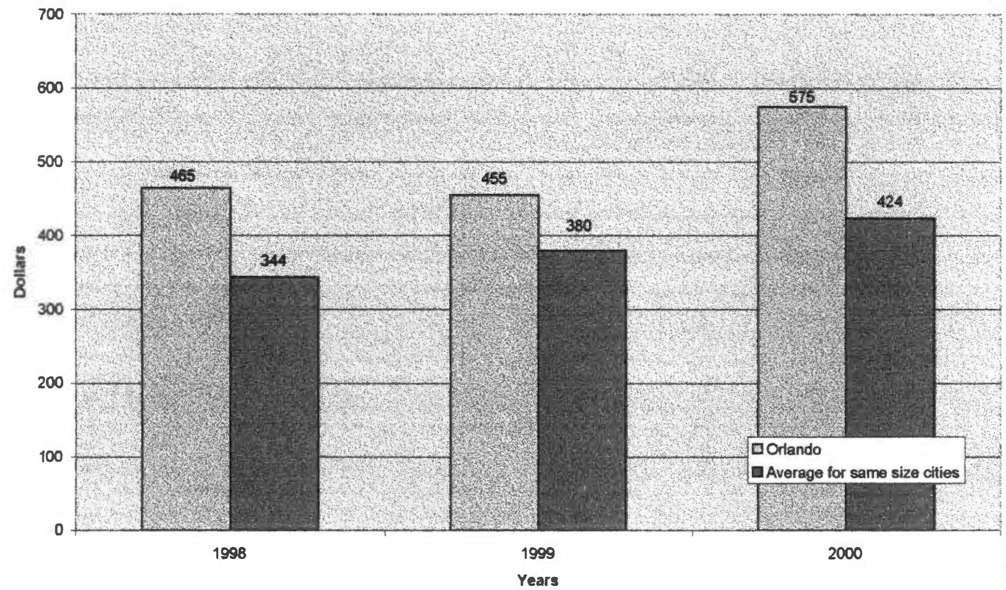

Figure A-36: Comparison of Trends in Annual Traffic Congestion Costs Per Capita Between Orlando and Average for Large Cities

Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

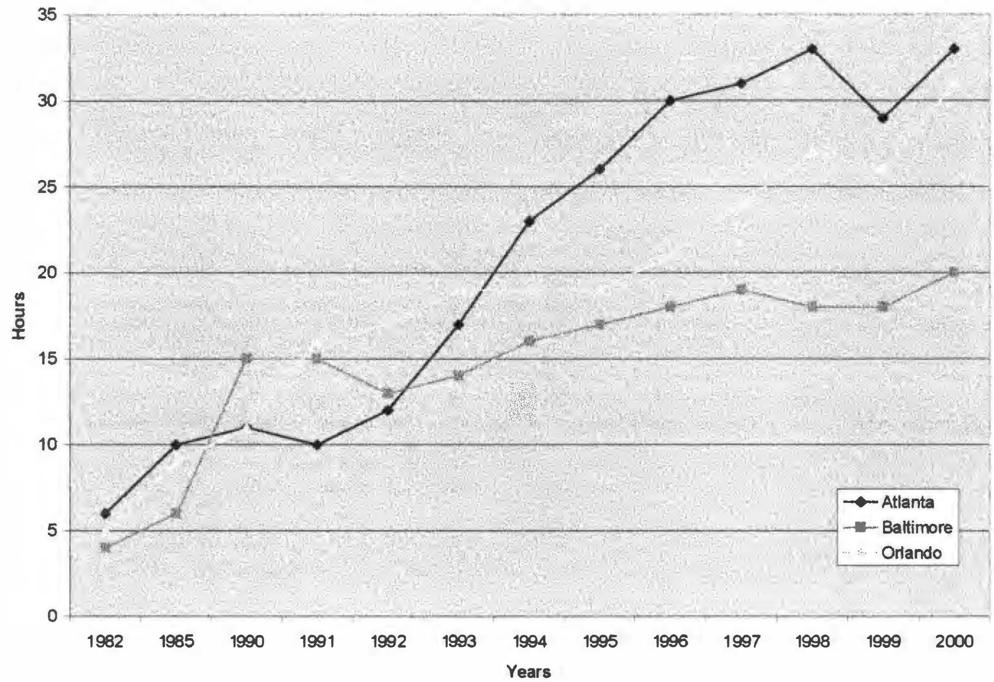

Figure A-37: Trends in Annual Hours of Highway Traffic Delay Per Person
Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

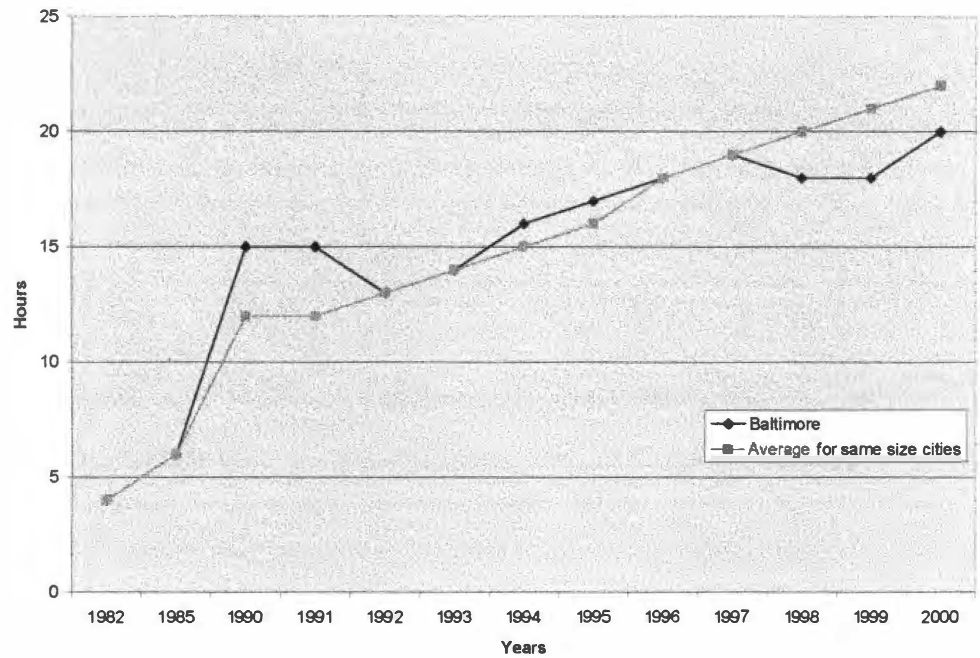

Figure A-38: Comparison of Trends in Annual Hours of Highway Traffic Delay Per Person Between Baltimore and Average for Large Cities

Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

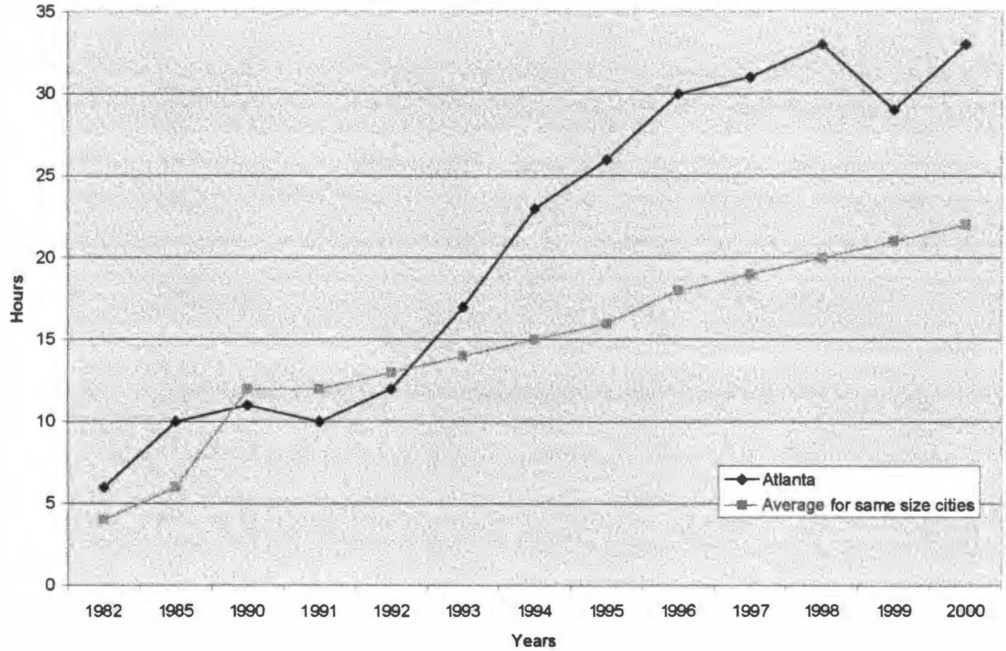

Figure A-39: Comparison of Trends in Annual Hours of Highway Traffic Delay Per Person Between Atlanta and Average for Large Cities
Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

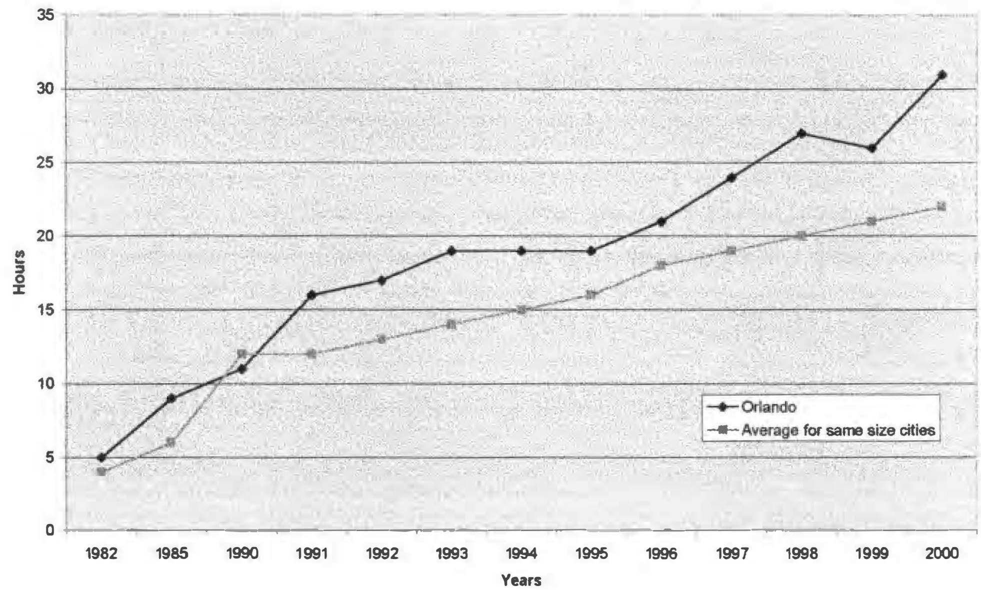

Figure A-40: Comparison of Trends in Annual Hours of Highway Traffic Delay Per Person Between Orlando and Average for Large Cities
Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

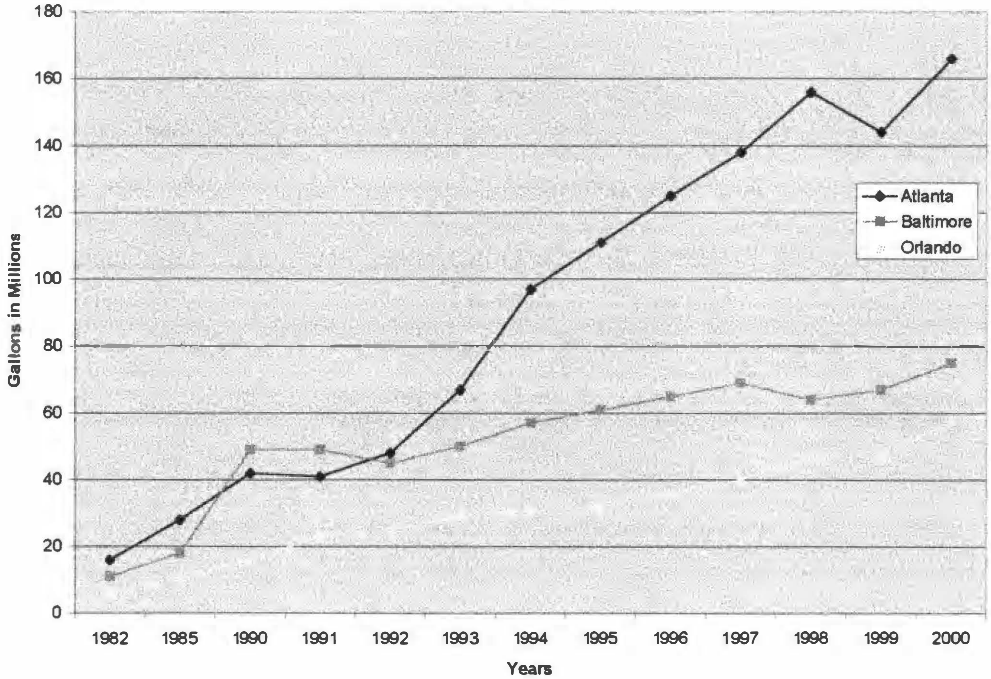

Figure A-41: Trends in Annual Wasted Fuel Due to Traffic Congestion
Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

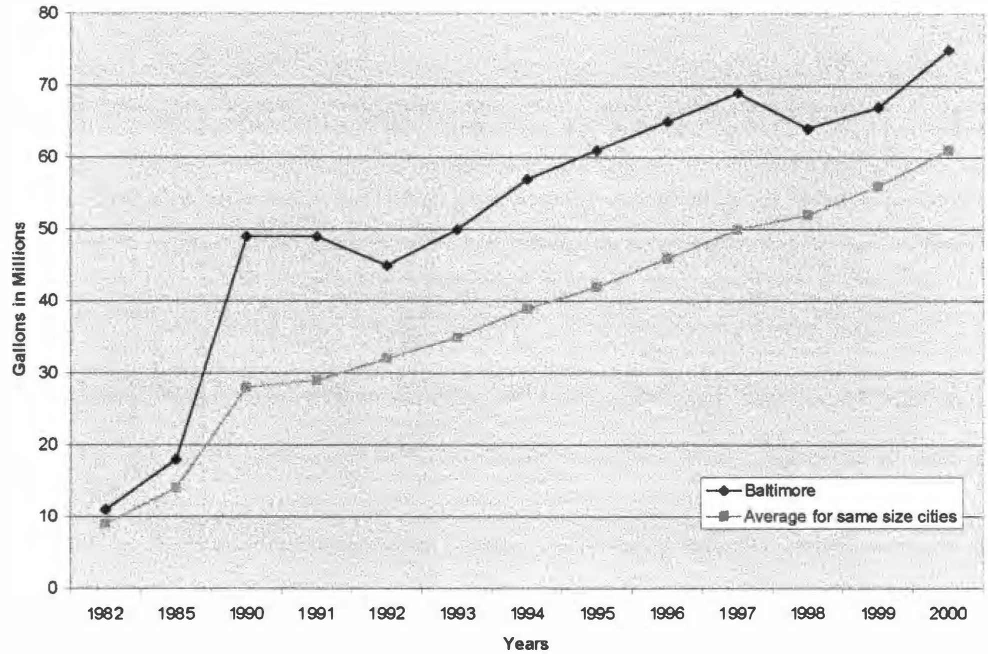

Figure A-42: Comparison of Trends in Wasted Fuel Due to Traffic Congestion Between Baltimore and Average for Large Cities

Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

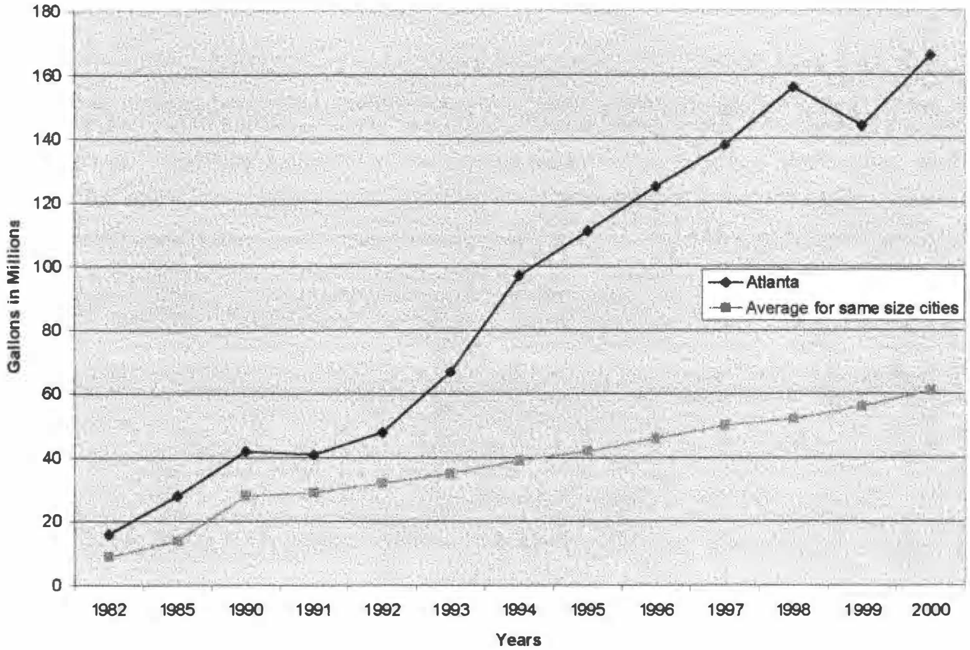

Figure A-43: Comparison of Trends in Wasted Fuel Due to Traffic Congestion Between Atlanta and Average for Large Cities

Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

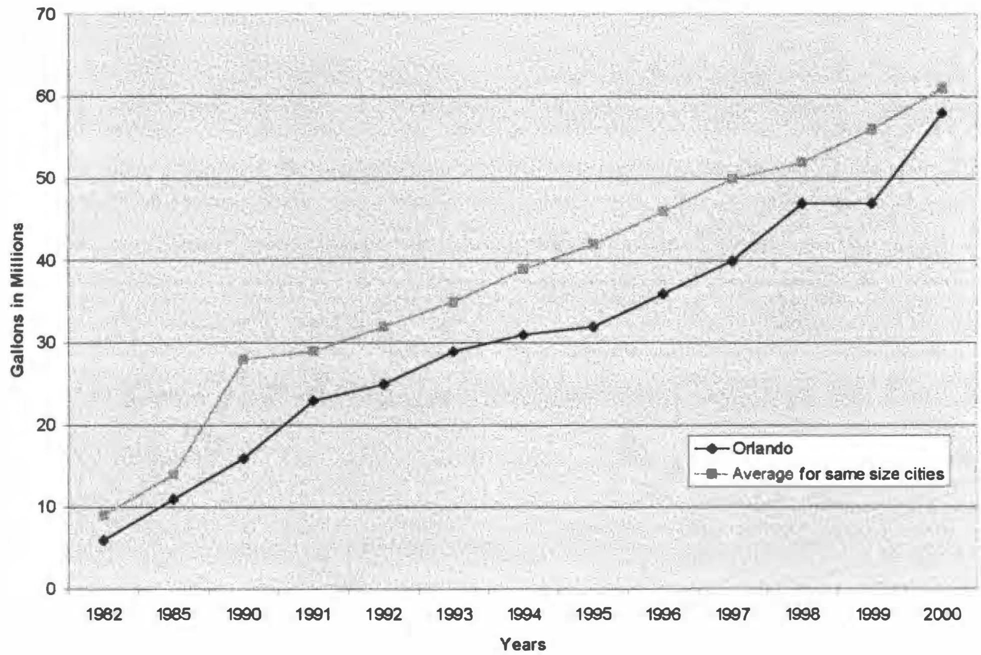

Figure A-44: Comparison of Trends in Wasted Fuel Due to Traffic Congestion Between Orlando and Average for Large Cities

Source: Texas Transportation Institute. *The 2001 Annual Mobility Report.* http://mobility.tamu.edu

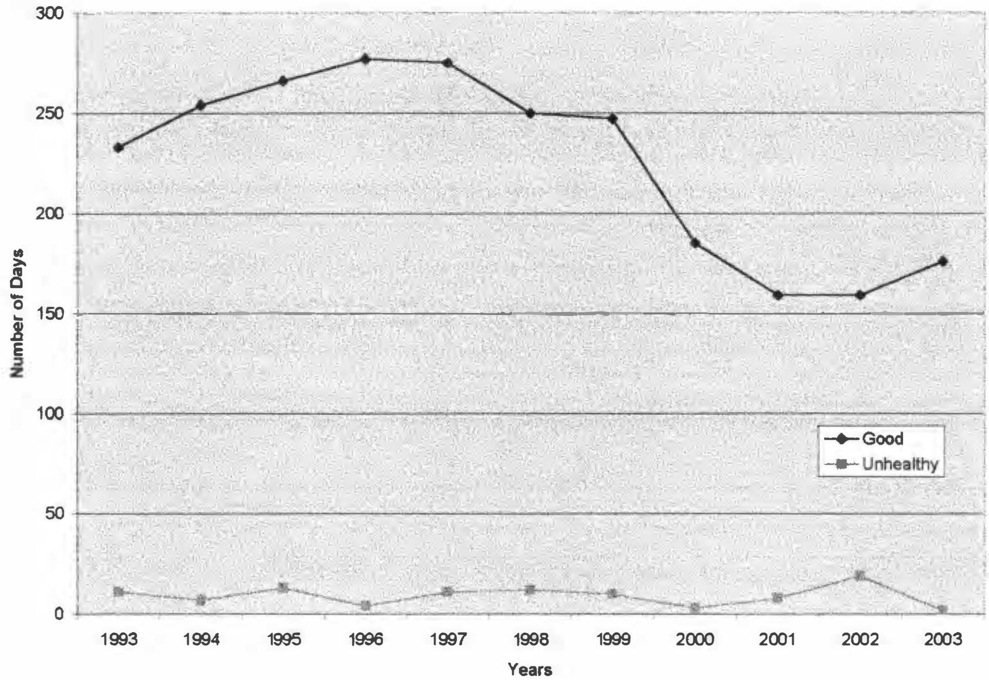

Figure A-45: Comparison of Good to Unhealthy Air Quality Days in Baltimore
Source: Environmental Protection Agency. *AirData.* http://oaspub.epa.gov/pls/airsdata/

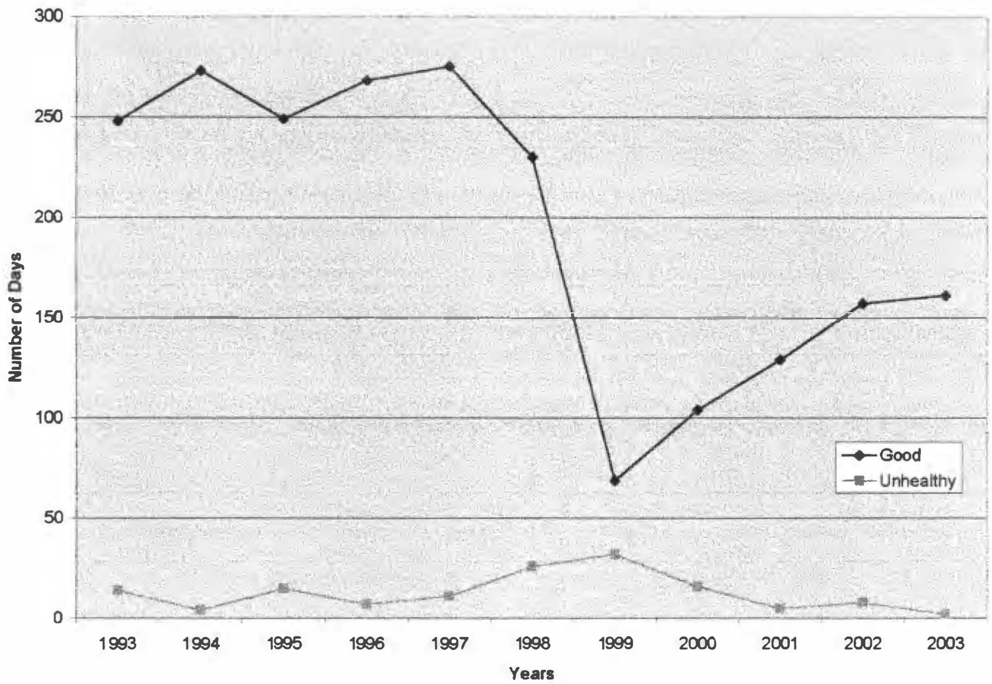

Figure A-46: Comparison of Good to Unhealthy Air Quality Days in Atlanta
Source: Environmental Protection Agency. *AirData.* http://oaspub.epa.gov/pls/airsdata/

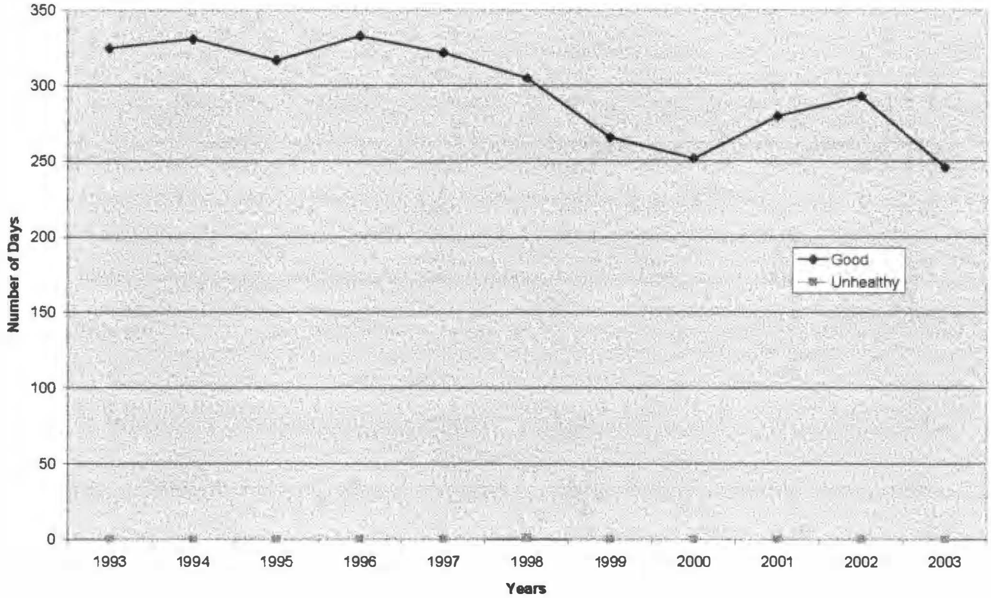

Figure A-47: Comparison of Good to Unhealthy Air Quality Days in Orlando
Source: Environmental Protection Agency. *AirData*. http://oaspub.epa.gov/pls/airsdata/

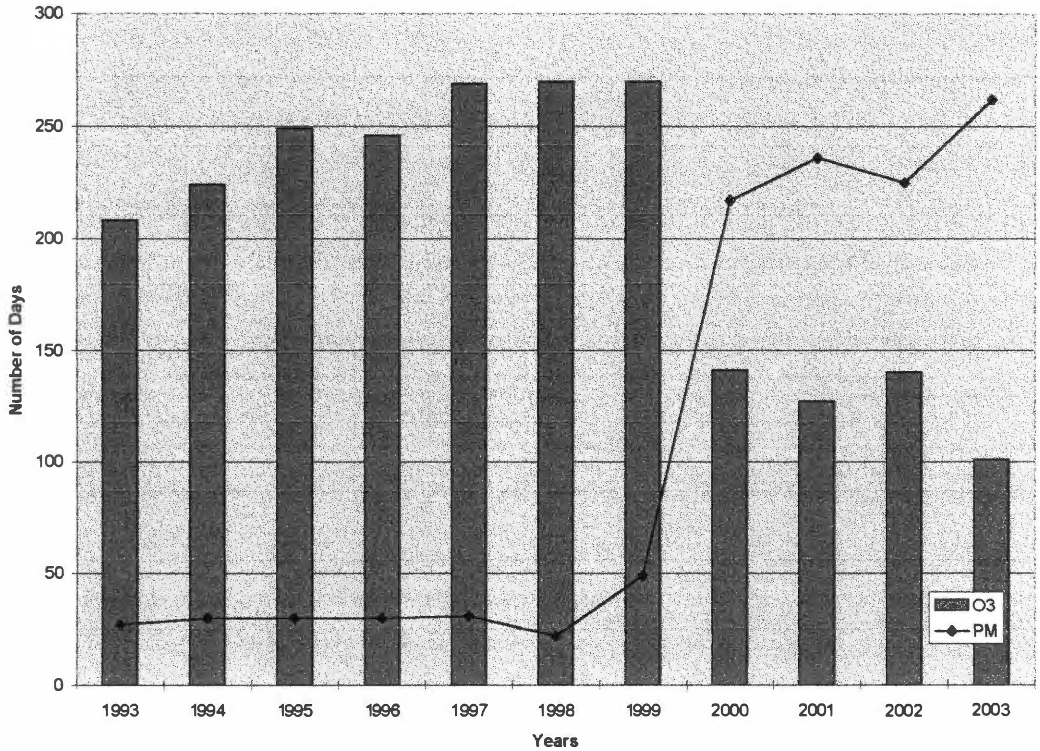

Figure A-48: Comparison of Trends in Number of Days Ozone and Particulate Matter Were Main AQI Pollutants in Baltimore
Source: Environmental Protection Agency. *AirData.* http://oaspub.epa.gov/pls/airsdata/

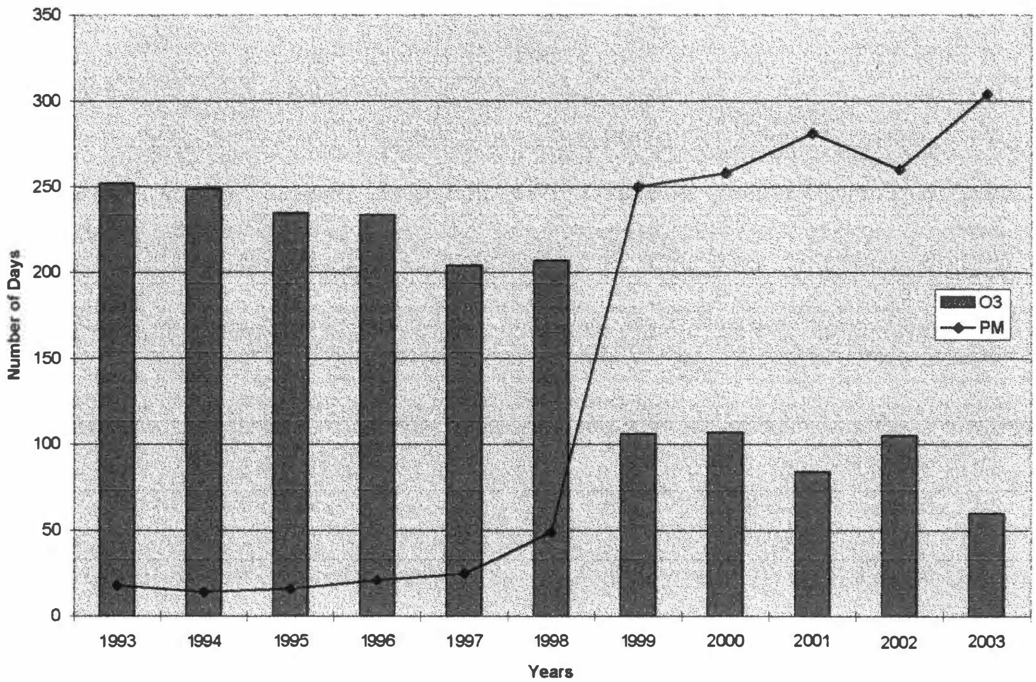

Figure A-49: Comparison of Trends in Number of Days Ozone and Particulate Matter Were Main AQI Pollutants in Atlanta

Source: Environmental Protection Agency. *AirData*. http://oaspub.epa.gov/pls/airsdata/

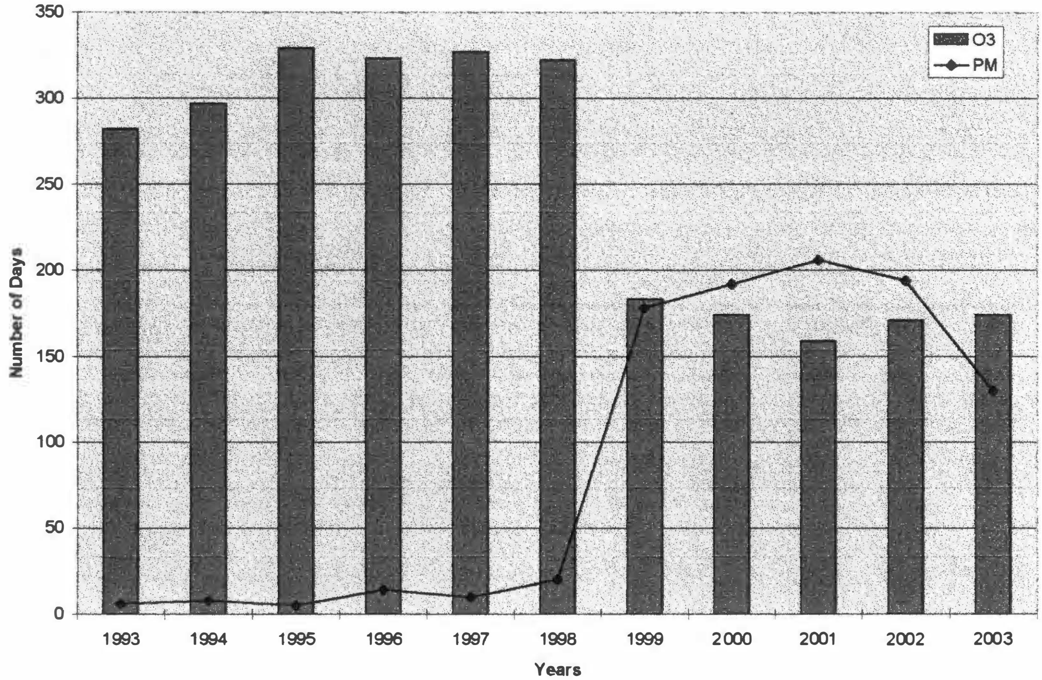

Figure A-50: Comparison of Trends in Number of Days Ozone and Particulate Matter Were Main AQI Pollutants in Orlando

Source: Environmental Protection Agency. *AirData.* http://oaspub.epa.gov/pls/airsdata/

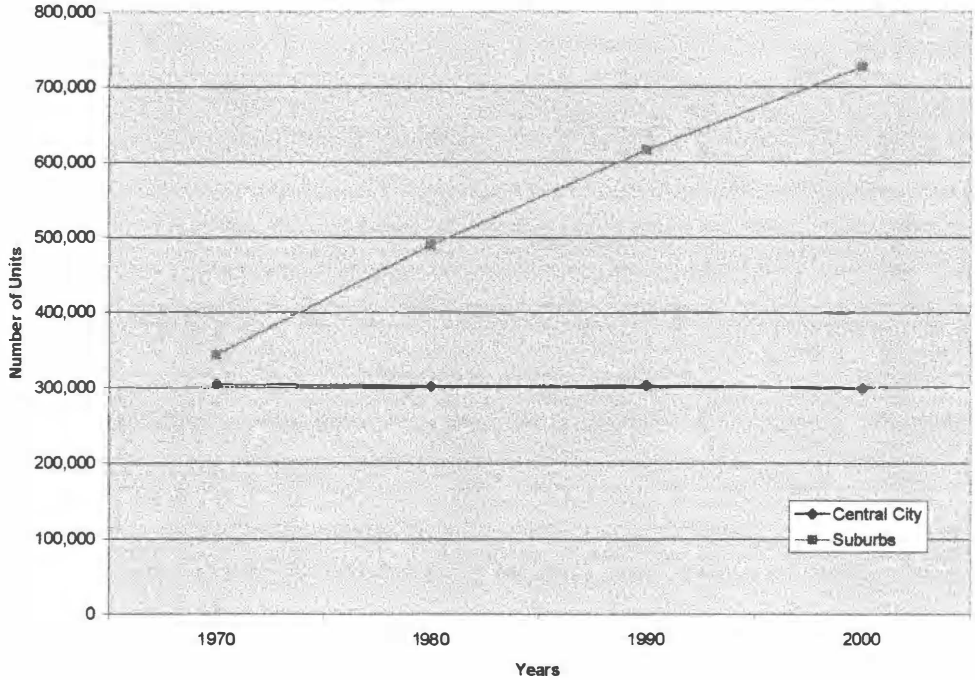

Figure A-51: Comparison of Total Housing Units in Baltimore
Source: Bureau of Census. *State of the Cities Data Set.* http://socds.huduser.org

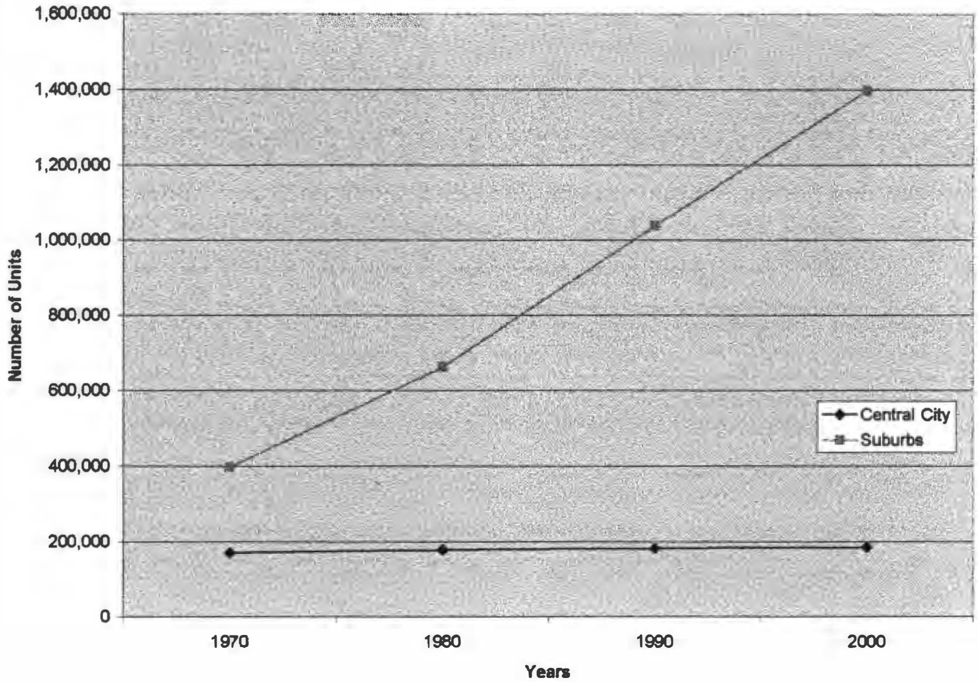

Figure A-52: Comparison of Total Housing Units in Atlanta
Source: Bureau of Census. *State of the Cities Data Set*. http://socds.huduser.org

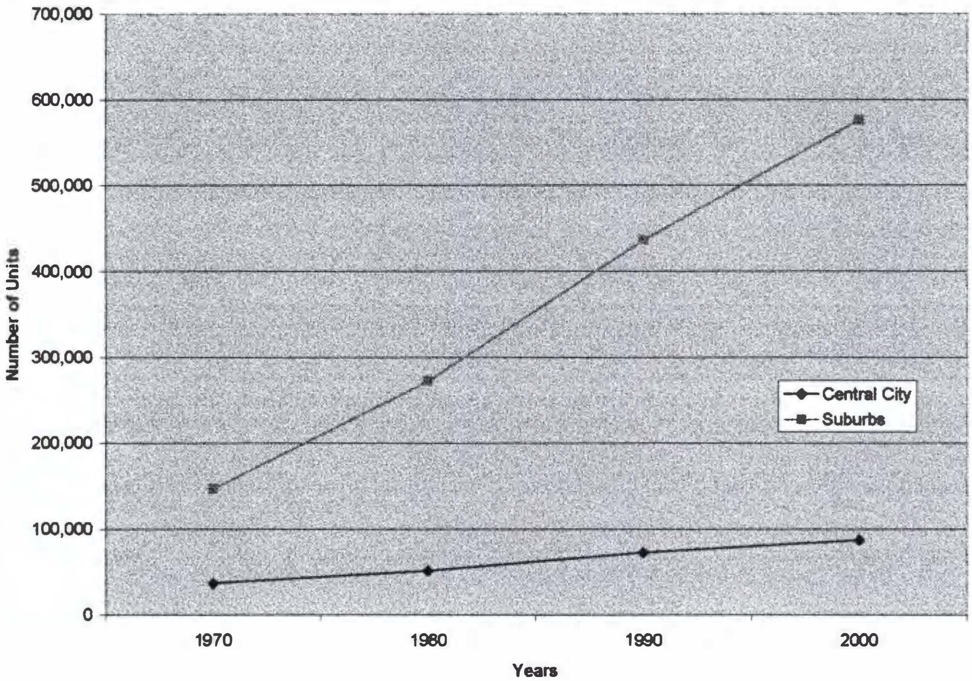

Figure A-53: Comparison of Total Housing Units in Orlando
Source: Bureau of Census. *State of the Cities Data Set*. http://socds.huduser.org

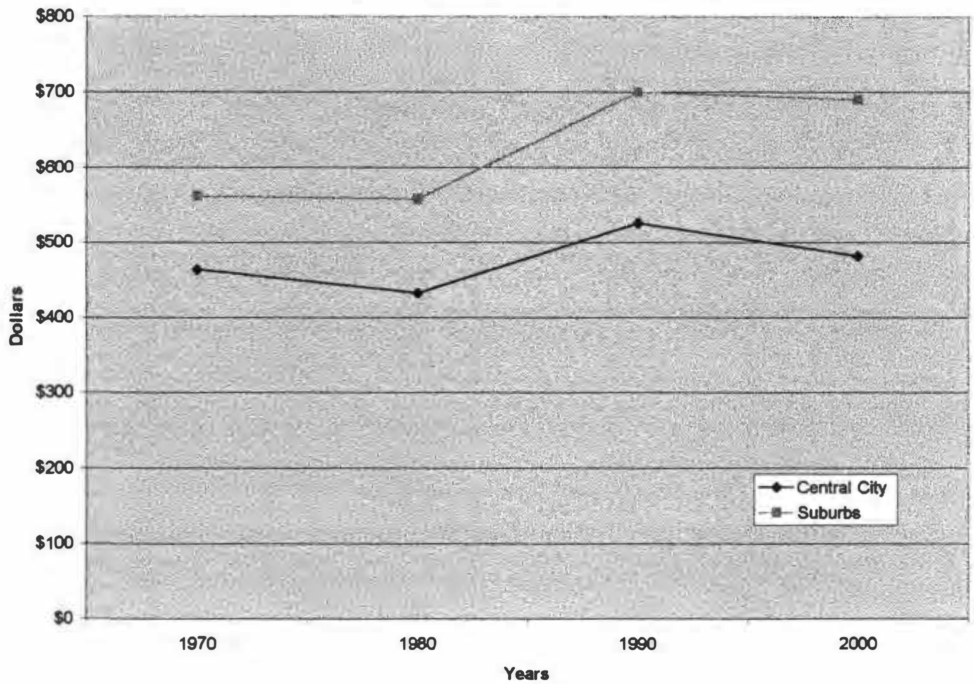

Figure A-54: Median Household Gross Rent in Baltimore (1999 Dollars)
Source: Bureau of Census. *State of the Cities Data Set.* http://socds.huduser.org

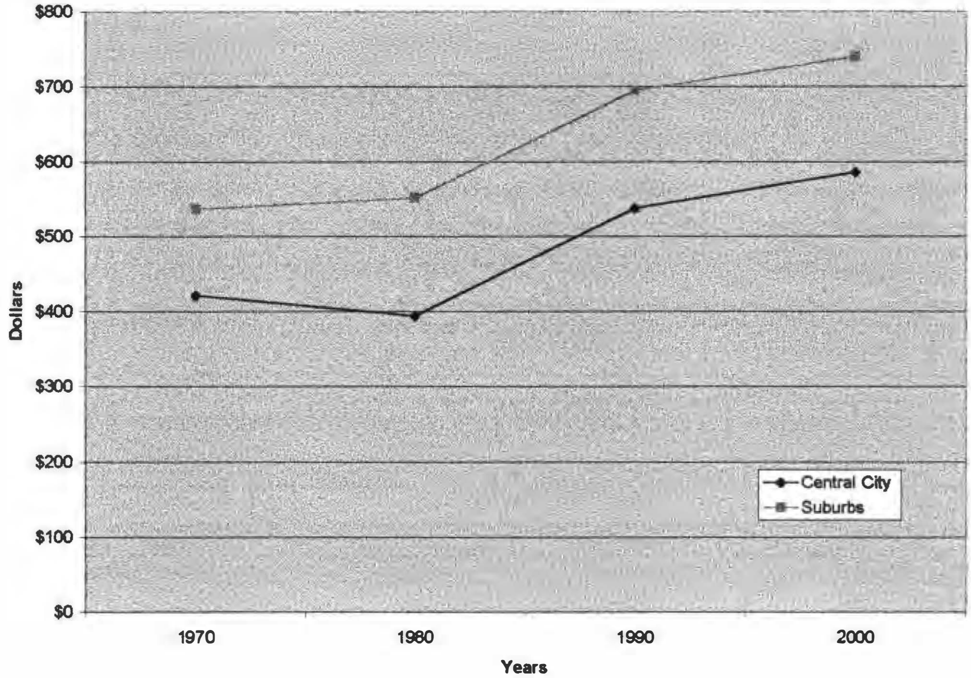

Figure A-55: Median Household Gross Rent in Atlanta (1999 Dollars)
Source: Bureau of Census. *State of the Cities Data Set.* http://socds.huduser.org

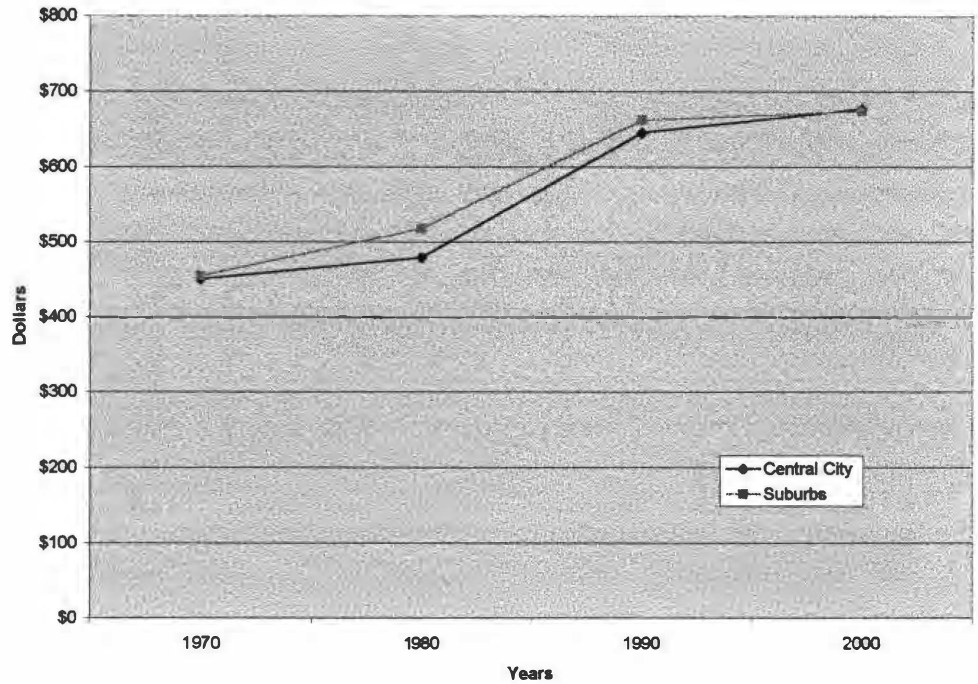

Figure A-56: Median Household Gross Rent in Orlando (1999 Dollars)
Source: Bureau of Census. *State of the Cities Data Set*. http://socds.huduser.org

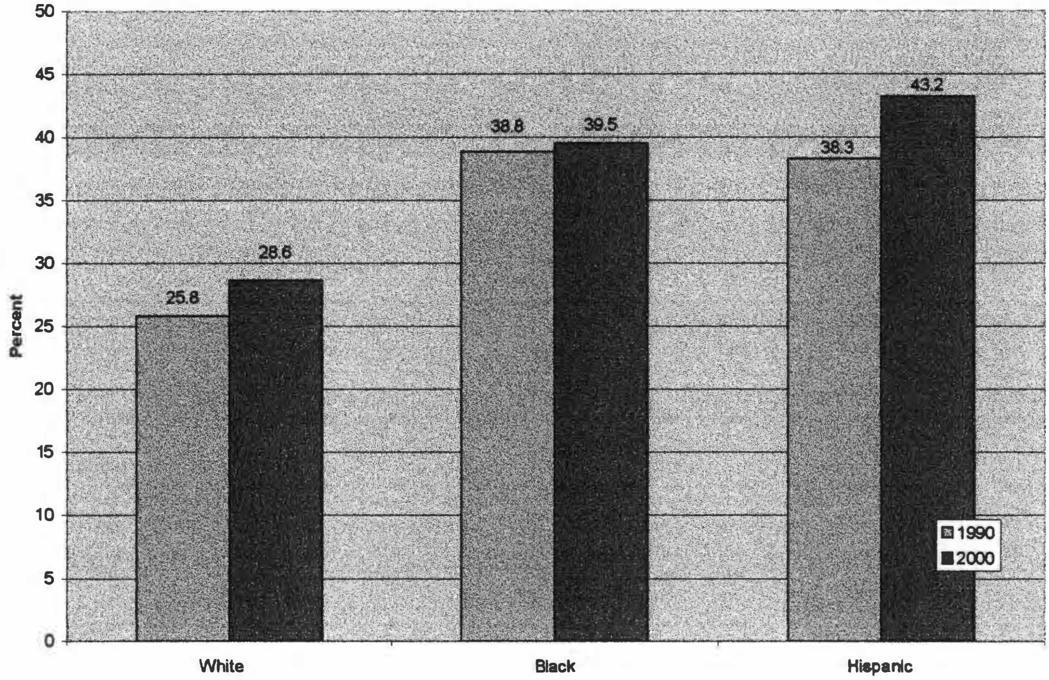

Figure A-57: Comparison in Percentage of Total Households in Baltimore With "Any Housing Problems" (As Defined by CHAS)
Source: Bureau of Census. *State of the Cities Data Systems: Comprehensive Housing Affordability Strategy Data.* http://socds.huduser.org

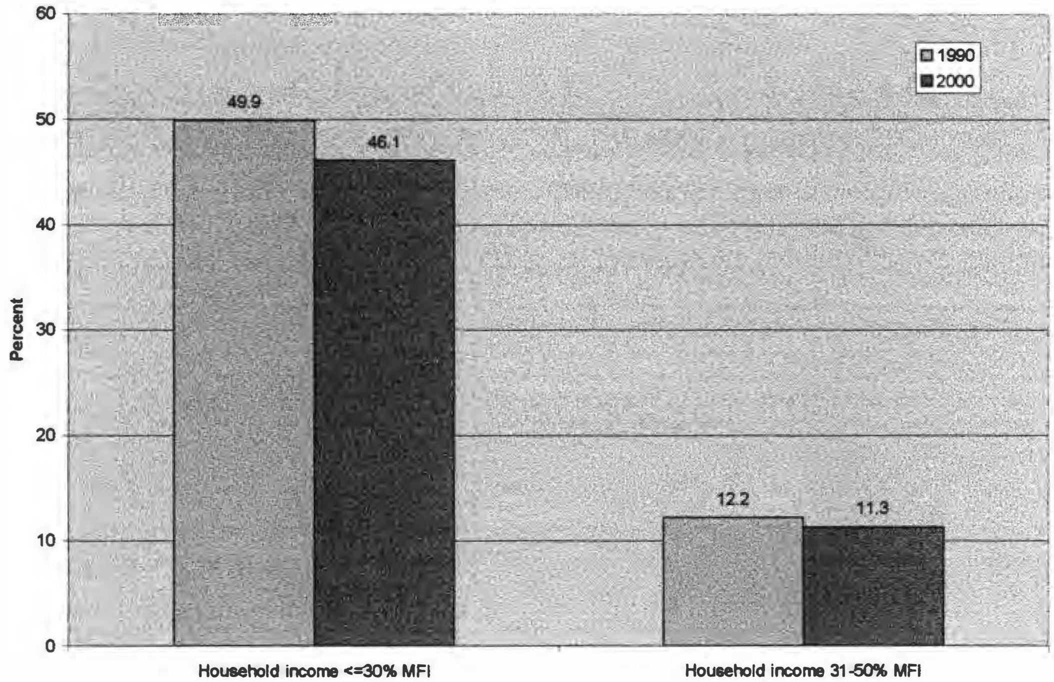

Figure A-58: Percentage of Population in Baltimore With a Housing Cost Burden Greater Than 50% of Their Income

Source: Bureau of Census. *State of the Cities Data Systems: Comprehensive Housing Affordability Strategy Data.* http://socds.huduser.org

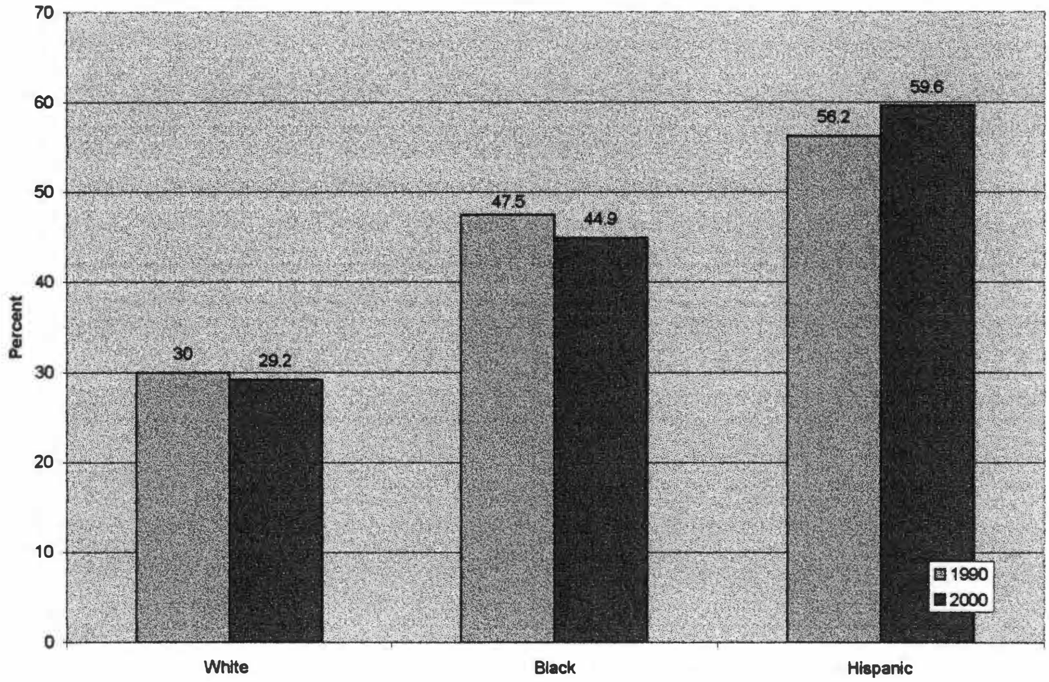

Figure A-59: Comparison in Percentage of Total Households in Atlanta With "Any Housing Problems" (As Defined By CHAS)
Source: Bureau of Census. *State of the Cities Data Systems: Comprehensive Housing Affordability Strategy Data.* http://socds.huduser.org

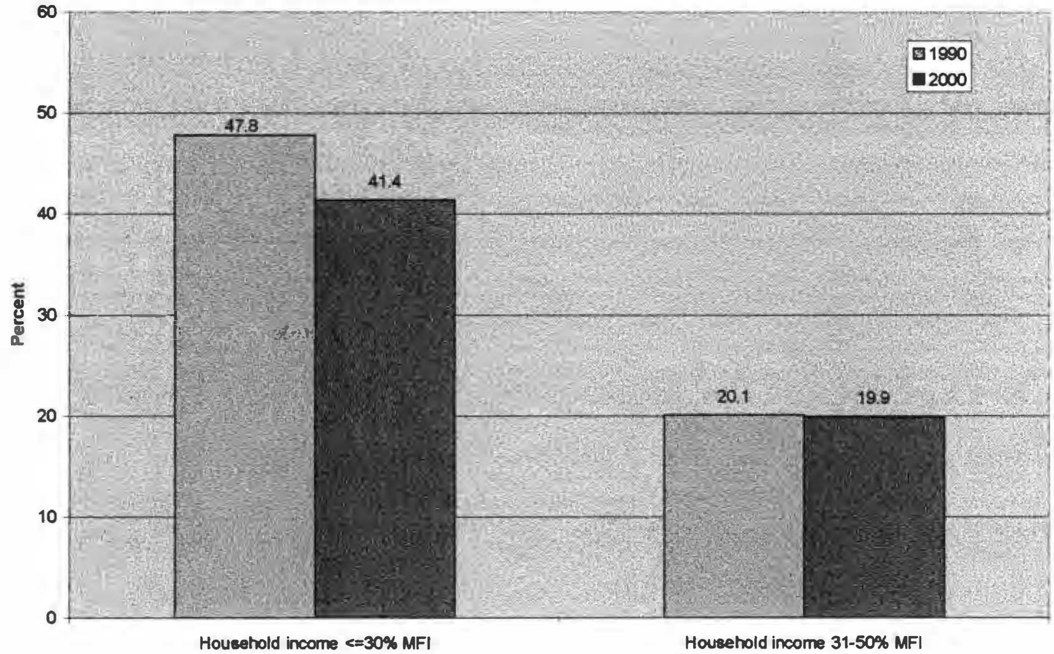

Figure A-60: Percentage of Population in Atlanta With a Housing Cost Burden Greater Than 50% of Their Income

Source: Bureau of Census. *State of the Cities Data Systems: Comprehensive Housing Affordability Strategy Data.* http://socds.huduser.org

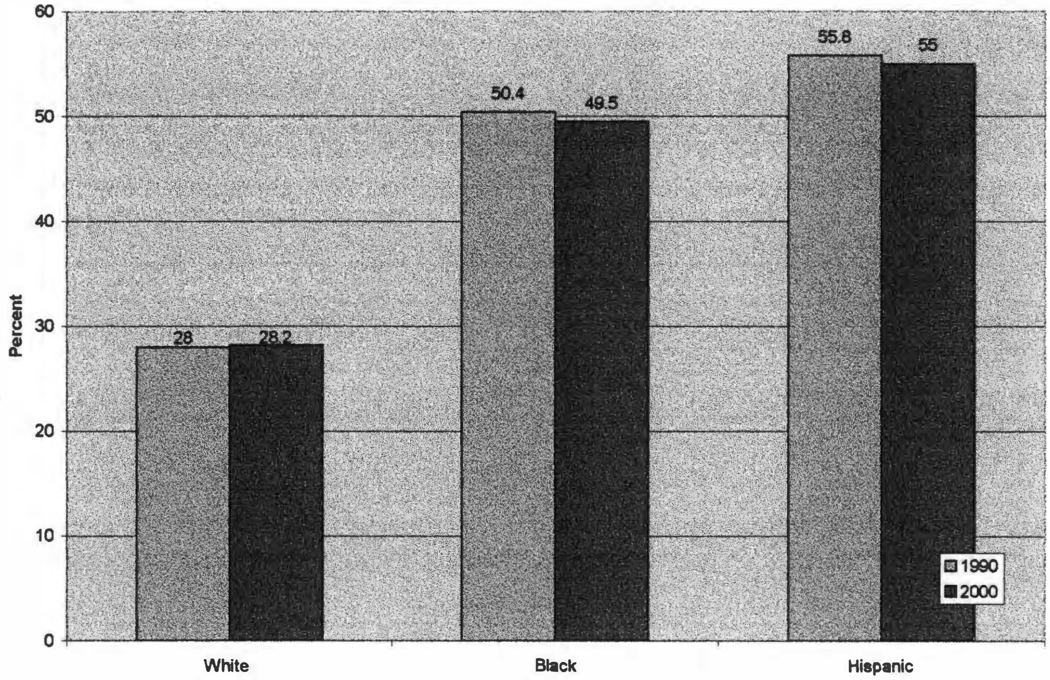

Figure A-61: Comparison in Percentage of Total Households in Orlando With "Any Housing Problems" (As Defined by CHAS)
Source: Bureau of Census. *State of the Cities Data Systems: Comprehensive Housing Affordability Strategy Data.* http://socds.huduser.org

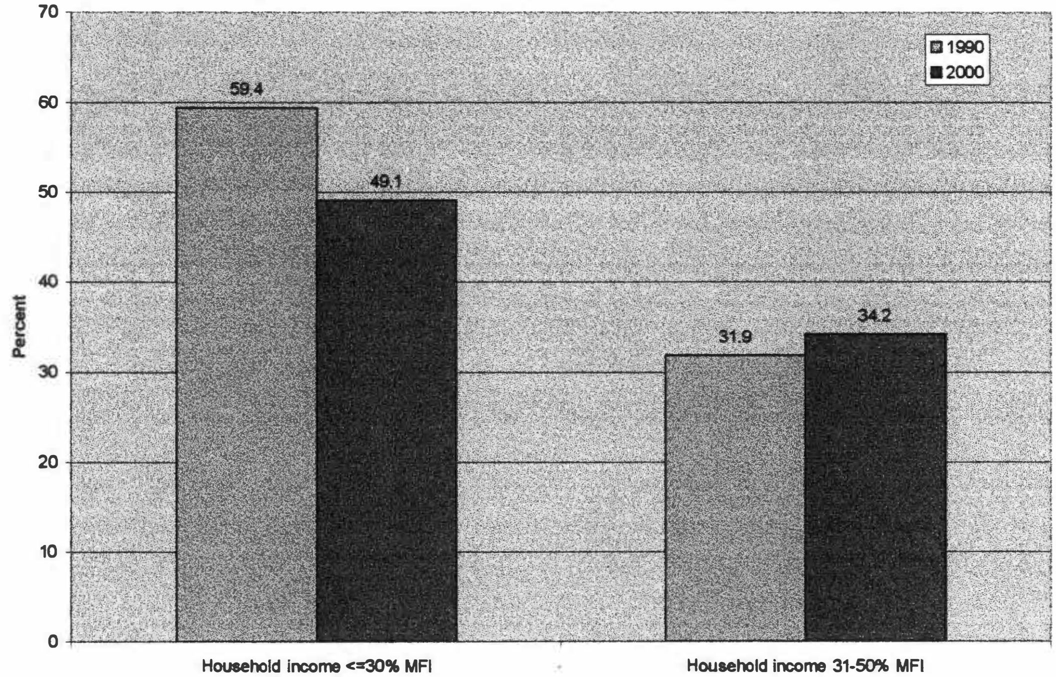

Figure A-62: Percentage of Population in Orlando With a Housing Cost Burden Greater Than 50% of Their Income
Source: Bureau of Census. *State of the Cities Data Systems: Comprehensive Housing Affordability Strategy Data.* http://socds.huduser.org

VITA

Jacqueline N. (Giles) Mitchell was born in Pensacola, FL on November 8, 1973. She was raised in central Florida, however, where she also attended college. She graduated summa cum laude from Florida Southern College in 1995 with a major in political science. In 1998, she completed a Masters degree in Public Administration at the University of Tennessee, Knoxville. Following that, Jacqueline began a doctoral program in political science that focused on American government, public administration, and research methods. The doctoral dissertation was defended in April, 2004, and Jacqueline graduated with a PhD in political science in August, 2004.

Jacqueline lives in Knoxville, TN with her husband, Jason Mitchell, an ornithologist and wildlife biologist. She is currently employed by the University of Tennessee as a Lecturer in the Department of Political Science.