THE EFFECTS OF LOCAL LAND USE REGULATION ON PROPERTY VALUES, JOURNEY TO WORK, AND THE QUALITY OF PUBLIC SERVICE DELIVERY: CASE STUDIES OF BOULDER, BERKELEY, AND FORT COLLINS

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THE EFFECTS OF LOCAL LAND USE REGULATION ON PROPERTY VALUES, JOURNEY TO WORK, AND THE QUALITY OF PUBLIC SERVICE DELIVERY: CASE STUDIES OF BOULDER, BERKELEY, AND FORT COLLINS

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Economics

Abstract

Beginning in the early 1960's, local governments throughout the United States have implemented growth management policies intended to influence the pattern of development and restrict growth. These regulations affect the conditions of community life by increasing property values, shifting demographics, and altering the delivery of public services. This thesis examines these effects through case studies of the City of Boulder, the City of Berkeley, and the City of Fort Collins, using data primarily from the US Census Bureau. It is hypothesized that the city with the most growth management policies will experience these effects to a greater magnitude. This was found to be partly true; there are other overriding factors that contribute to these changes more so than the presence or absence of growth management policies.

KEYWORDS: (Local Land Use Regulation, Property Values, Growth Management)

ON MY HONOR, I HAVE NEITHER GIVEN NOR RECEIVED
UNAUTHORIZED AID ON THIS THESIS

Signature

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CHAPTER 1

INTRODUCTION

> *The "organized effort to affect the outcome of growth distribution is the essence of local government as a dynamic political force. It is not the only function of government, but it is the key one and, ironically, the one most ignored."* —Harvey Molotch [1]

Urban development and the process of growth has long been a concern of states, counties, cities, and their citizens; Leo and Brown write, "the consensus is that growth is the primary preoccupation of city politics and policy" and that, more often than not, growth is overwhelmingly sought after.[2] However, this idea of growth as always desirable, is changing for a variety of reasons, ranging from environmental concerns to improving the quality of publicly used resources. Beginning in the early 1960's, local governments throughout the United States have implemented a number of different growth management and containment polices to manage and influence patterns of development, causing conditions of community life to change.[3] The movement began in a few select states, namely Hawaii, California, Colorado and Oregon as a response to

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[1] Harvey Molotch. "The City as a Growth Machine: Toward a Political Economy of Place." *The American Journal of Sociology* 2, no. 82 (1976): 309-332.

[2] Christopher Leo and Wilson Brown "Slow Growth and Urban Development Policy." *Journal of Urban Affairs* 2, no. 22 (2000): 193-213.

[3] Chris Williamson. "Exploring the No Growth Option." *American Planning Association* (2004): 34-36.

various factors, including environmental concerns and the overuse of resources. Most restrictions on development are passed in areas that have experienced high rates of growth.

These policies vary greatly in form and implementation, as do their implications and effects on the communities in which they are in place. In *Explaining Urban Development Policy,* authors Lewis and Neiman write, "the core policy among local governments is development policy. Certainly, in the United States, the mix of land uses—as between residential, commercial, industrial, manufacturing, and public enterprises—has a profound impact on the fortunes of communities and their residents."[4] This impact is especially important in considering the adoption of growth policy because residents and their communities are absolutely affected by development policy.

It has been shown that cities that have restricted growth may alienate certain demographics—low income families may be forced to leave as home and property values increase, industry may be shut down due to higher tax rates, traffic congestion might increase as employees can no longer afford to be residents in the city in which they work. These factors, and the many more that have not yet been mentioned, contribute to the quality of life in the community. This thesis will study and compare the effects that local growth management policy has had on the cost of housing, citizens ability (inability) to reside in the same city in which they are employed, and the quality of public services through case studies of Boulder, Colorado and Berkeley, California. Fort Collins, Colorado will serve as a comparison city—one that has a very limited policy on restricting growth.

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[4] Paul Lewis and Max Neiman "The Vision Thing: Explaining Urban Development Policy." (2003): American Political Science Association. http://www.allacademic.com/meta/p_mla_apa_research_citation/0/6/2/1/4/p62149_index.html. [accessed 26 March 2010].

LITERATURE REVIEW

Using Pendall and Martin's definition, growth management is "the deliberate and integrated use of the planning, regulatory, and fiscal authority of state and local governments to influence the pattern of growth and development in order to meet projected needs."[5] The keyword here is *deliberate* in that most cities have some sort of regulatory measure—zoning—in place whether it was passed for the explicit purpose of growth management or not.[6] This distinction is important to make because this literature review considers policies that have been passed to deliberately restrict growth and development.

Overview of Growth Management Policy

Growth management has long been present in the public agenda at the local level. Grassroots organizations and regional governments attempted to pass growth policies in the 1950s in Colorado and California, but the movement really began (with a few exceptions) in Oregon during the 1970s as a response to development induced environmental degradation.[7] Landis writes, "the low growth control and growth management movement remains extremely active, especially at the ballot box and

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[5] Rolf Pendall and Jonathan Martin. "Holding the Line: Urban Containment in the United States." *The Brookings Institution Center on Urban and Metropolitan Policy* (2002): 1-51.

[6] Christopher Berry. "Land Use Regulation and Residential Segregation: Does Zoning Matter." *American Law and Economics Association* (2001): 251-274. 10/11/2009.

[7] Brent S. Steel and Nicholas P. Lovrich. "Growth Management Policy and County Government: Correlates of Policy Adoption across the United States." *State and Local Government Review* 1, no. 32 (2000): 7-19.

especially in California."[8] No major study since 1994 has examined growth management policy adoption on a national level, leaving doubts about the ongoing proliferation of growth management controls.

Why Manage Growth?

Cities adopt growth management policies for a variety of reasons. Most literature mentions the problems associated with growth—namely increased air and water pollution, traffic congestion, overcrowding of public resources, overtaxing of natural amenities—as principle reasons for adopting development policy. Wu and Cho's 2007 study attributed "risks associated with alternative land uses" as the principle reason for adopting local land use controls.[9] These risks include concerns about conservation of farmland, forestland, and natural areas. Considering that undeveloped land and farmland in the United States is becoming more and more scarce as it succumbs to pressures to develop, (from 1945 to 1990 the total area of farmland decreased by 17%, while the total area of developed land almost doubled) these concerns are valid reasons for choosing to adopt land use regulatory policy.

Environment protection represents another valid concern as the public becomes increasingly aware of the importance of biodiversity and the integral role diverse animal and plant populations play in contributing to human health and the quality of life.[10] The

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[8] John D. Landis Lan Deng, and Michael Reilly. "Growth Management Revisited: A Reassessment of its Efficacy, Price Effects, and Impacts on Metropolitan Growth Patterns." *University of California Institute of Urban and Regional Development* (2002): 1-48.

[9] Junjie Wu and Seong-Hoon Cho. "The Effect of Local Land Use Regulation on Urban Development in the Western United States." *Regional Science and Urban Economics* 37 (2007): 69-86, www.sciencedirect.com [accessed February 1, 2010].

[10] Sharon McGregor and Jack Ahern. "Biodiversity Conservation and Ecosystem Protection." In *Preserving and Enhancing Communities: A Guide for Citizens, Planners, and Policymakers,* ed. Elisabeth M. Hamin, Priscilla Geigis, and Linda Silka, 101-119. USA, 2007: University of Massachusetts Press.

biggest threat to biodiversity is habitat loss, which is certainly spurred by development as humans' influence infiltrates natural vegetation areas causing pollution, sedimentation, and/or the disruption of natural processes.[11] Furthermore, biodiversity positively affects communities and their residents daily by providing clean air and water and also has pronounced emotional effects, namely increasing mental well being.[12]

The authors of *Biodiversity Conservation and Ecosystem Protection* write, "Like the 'canary in the coal mine,' changes in local biodiversity can provide early warning of environmental changes that may have direct human consequences, including loss of water quality, destabilization of soils, loss in forest productivity, or change in quality of life values that are difficult to quantify: loss of recreational opportunity, less frequent personal association with the plants and animals of a region, or loss of a community's rural identity and character."[13] Considering this, environmental protection is a key reason to adopt growth management policies—especially those that serve to reduce sprawl, protect existing open space, and require an assessment review to evaluate potential environmental impacts from development.

Landis et al. (2002) found that the main reason for adopting controls is due to the rate of regional population growth.[14] This conclusion is supported by Baldassare (1982), who was also able to conclude that "social factors do predict which city planning

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[11] Ibid

[12] Ibid

[13] Ibid

[14] Ibid

agencies adopt growth control policies."[15] Molotch (1967) writes, "The people who participate with their energies, and particularly their fortunes, in local affairs are the sort of persons who—at least in vast disproportion to their representation in the population—have the most to gain or lose in land use decisions."[16] In the case of growth management, the people who support these policies tend to be wealthy; most policy is adopted as a result of the work of grassroot institutions and neighborhood activists—people with time on their hands.[17] Proponents are normally more educated: "The college educated are more likely to create and participate in civic groups and organizations, particularly those devoted to environmental protection and historic preservation."[18] Molotch cites that cities in which universities are located are more likely to adopt policy, as the college will publish documents about the adverse effects of growth on their city.[19] Landis et al. (2002) reports "higher levels of homeownership, higher percentages of Hispanic residents, less transient populations, and the availability of sewer service" to be the main determinants of policy adoption.[20] Additionally, states that mandate growth management

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[15] Mark Baldassare and William Protash. "Growth Controls, Population Growth, and Community Satisfaction." *American Sociological Review* 3, no. 47 (1982): 339-346.

[16] Harvey Molotch. "The City as a Growth Machine: Toward a Political Economy of Place." *The American Journal of Sociology* 2, no. 82 (1976): 309-332.

[17] Lenahan O'Connell . "The Impact of Local Supporters on Smart Growth Policy Adoption." *Journal of the American Planning Association* 3, no. 75 (2009): 281-291. 10/11/2009.

[18] Ibid

[19] Harvey Molotch. "The City as a Growth Machine: Toward a Political Economy of Place." *The American Journal of Sociology* 2, no. 82 (1976): 309-332.

[20] John D. Landis Lan Deng, and Michael Reilly. "Growth Management Revisited: A Reassessment of its Efficacy, Price Effects, and Impacts on Metropolitan Growth Patterns." *University of California Institute of Urban and Regional Development* (2002): 1-48.

policy influence local governments, leading to higher rates of land use policy adoption.[21]

Types of Growth Management Policy

Growth management policy takes many forms. Often cities adopt many different measures to achieve a goal; they are sometimes coordinated and sometimes unrelated.[22] The four main forms of management are: annual housing caps, residential adequate public facilities ordinances, urban growth boundaries, and ballot-box zoning. Pendall (2002) categorizes them as push and pull factors: greenbelts and policies used to limit growth are used to affect the push factors while urban service areas are used to affect the pull factors.[23] Cities that place controls on growth "push" urban growth away from the center, causing development to take place elsewhere in its stead. This is in conflict with the "pull" factors that make cities attractive places to live: the urban services and infrastructure benefits that they are able provide to their citizens by being a city.

Annual housing caps dictate the number of additional units that may be constructed within a given area each year. Typically, cities regulate the number of residential housing permits issued annually to control development. Scholars differ in their conclusions on annual housing caps and their effectiveness: Landis et al. found the population growth rate to be 8% lower in cities with annual housing caps in comparison

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[21] Yin, Ming and Jian Sun. "The Impacts of State Growth Management on Urban Sprawl in the 1900s." *Journal of Urban Affairs* 2, no. 29 (2007): 149-179.

[22] Chris Williamson. "Exploring the No Growth Option." *American Planning Association* (2004): 34-36. 10/11/2009.

[23] Rolf Pendall and Jonathan Martin. "Holding the Line: Urban Containment in the United States." *The Brookings Institution Center on Urban and Metropolitan Policy* (2002): 1-51.

to their peers.[24] Steel and Lovrich write that growth controls do not always work as intended: "moratoria, growth limits, environmental regulations, public facility requirements...do not seem to affect population growth."[25]

Residential Adequate Public Facilities Ordinances (APFOs) are adopted to help cities cope with the fiscal and infrastructure impacts of growth. Many states mandate APFOs as part of responsible planning. Most analysts conclude that APFOs actually make the city more attractive to development because it is better enabled to deal with growth. Acting alongside APFOs are project level environmental assessments that evaluate the impact of development. APFOs are rather similar to comprehensive planning documents that coordinate county and local development goals in that they both require responsible planning and collaboration from many different departments. The status of these documents have been included in a number of studies, including Glickeld and Levine's 1992 survey.

Urban growth boundaries (UGBs) (sometimes called urban limit lines, greenbelts, blue lines, green lines) limit the spatial growth of the cities that adopt them but not necessarily the numerical amount of growth. Urban containment policies are within the scope of growth management, but are unique in that they regulate growth to specified areas that are designated for certain uses: residential, industrial, business, or no-growth. Urban containment is then defined as "an attempt to deliberately use their public land acquisitions, land-use regulations, and infrastructure investments to contain, influence, or

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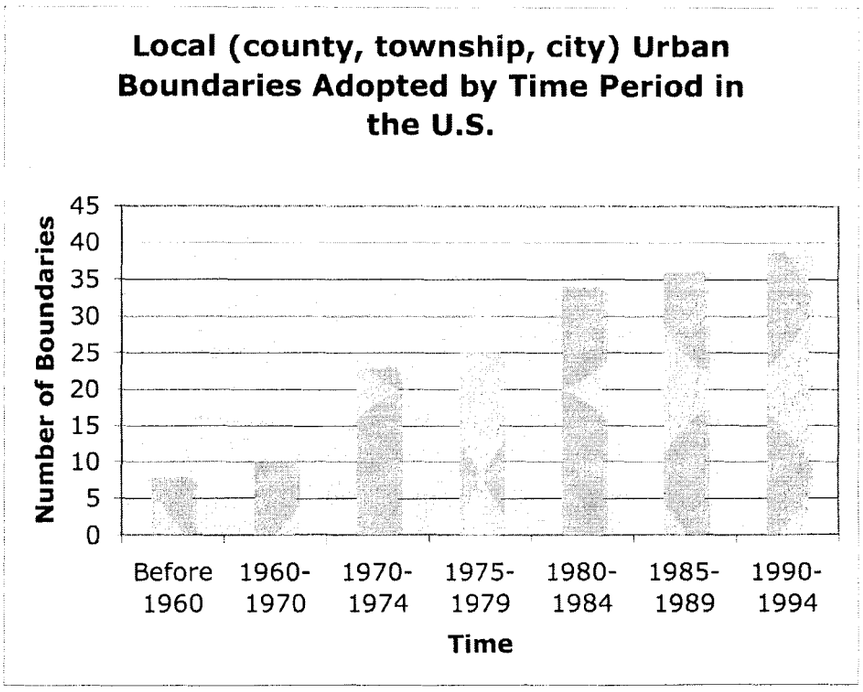
[24] John D. Landis Lan Deng, and Michael Reilly. "Growth Management Revisited: A Reassessment of its Efficacy, Price Effects, and Impacts on Metropolitan Growth Patterns." *University of California Institute of Urban and Regional Development* (2002): 1-48.

[25] Brent S. Steel and Nicholas P. Lovrich. "Growth Management Policy and County Government: Correlates of Policy Adoption across the United States." *State & Local Government Review* 32, no. 1 (Winter 2000): 7-19.

direct growth to specific geographical locations."[26] Boulder, Colorado provides a good example as it has, as a city, purchased surrounding open space and kept it off limits to development. Urban boundaries are efficient in curbing sprawl and keeping growth in interior areas, however housing unit growth rates in cities with boundaries in place grow at a rate 18% faster than their peer cities.[27]

Figure 1, recreated from Pendall's study about the adoption of growth policy across the United States, shows the increase in growth boundaries adopted.[28]

Figure 1.1: Urban Growth Boundaries Adopted by Time Period



Source: Rolf Pendall and Jonathon Martin

In addition to demonstrating the increase in policy adoption over time, Pendall and Martin's 1994 study of the 25 largest metropolitan areas in the United States found

[26] Rolf Pendall and Jonathan Martin. "Holding the Line: Urban Containment in the United States." *The Brookings Institution Center on Urban and Metropolitan Policy* (2002): 1-51.

[27] Ibid

[28] Ibid

that 17% of these metropolitan areas had urban boundaries in place and 30% had adopted adequate public facilities ordinances. Urban boundaries were used nearly three times more often in counties than in cities, and were most commonly used in large metropolitan areas in the Mid-Atlantic and Florida.[29]

Ballot-box zoning allows residents to dictate development through voting—local ballot initiatives that override, replace, or reinforce elected officials stance on either site-specific or general land use.[30] These initiatives are allowed according to state; California leads the nation introducing initiatives, proposing over 600 ballot measures between 1986 and 2000.[31]

Implementation Issues

"A review of the research suggests that—as is so often the case with land-use policy—the impact of urban containment policy depends not so much on the nature of the policy itself but on its implementation."[32] An example of this is Portland's implementation of urban growth boundaries and intermediate growth boundaries. (Intermediate growth boundaries can be thought of as the same as urban growth boundaries, but they have the potential to expand and have an earlier expiration date.) Two counties surrounding Portland, Washington County and Clackamas County, adopted the same policy, but in Clackamas County, "where the instruments to control growth inside the urban growth boundary (UGB) were weakly enforced, the results supported the

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[29] Ibid

[30] Williamson, Chris. "Exploring the No Growth Option." *American Planning Association* (2004): 34-36. 10/11/2009.

[31] Ibid

[32] Rolf Pendall and Jonathan Martin. "Holding the Line: Urban Containment in the United States." *The Brookings Institution Center on Urban and Metropolitan Policy* (2002): 1-51.

model only in part."[33] That is that in Clackamas County, where policy was weakly enforced, the effects of that policy were similarly weaker.

Effects of Local Land Use Regulation

Limit Supply of Available Land

Wu and Cho (2007) studied five Western states to determine the effect of local land use regulation on urban development. To measure and quantify regulatory policies, they grouped 29 different regulations into four groups: development guidelines, incentive based policies, property acquisitions, and zoning ordinances; of which all were found to be statistically significant at the 5% level, except zoning. Their study concluded that all local land use regulations reduced the total supply of newly developed land by an average of 10% between the years 1982 and 1997.[34]

Additionally, urban growth boundaries reduce the supply of land available for development at the outer rims of a metropolitan area. Dawkins and Nelson (2002) write that by "reducing the total supply of urban fringe land available for housing construction, the provision of housing for the most affordable segments of the housing market becomes unprofitable, and average housing prices rise due to the overabundance of higher priced new housing units."[35] They attribute this effect to the highly segmented nature of the housing market.[36]

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[33] Gerrit J. Knapp. "The Price Effects of Urban Growth Boundaries in Metropolitan Portland, Oregon." *Land Economics* 1, no. 61 (1985): 26-35.

[34] Junjie Wu and Seong-Hoon Cho. "The Effect of Local Land Use Regulation on Urban Development in the Western United States." *Regional Science and Urban Economics* 37 (2007): 69-86, www.sciencedirect.com [accessed February 1, 2010].

[35] Casey J. Dawkins and Arthur C. Nelson, "Urban Containment Policies and Housing Prices: An International Comparison with Implications for Future Research," Land use Policy 19 (2002): 1-12.

[36] Ibid

Property Values

Conventional economic theory dictates that land-use policies that influence the allocation of land must affect land values.[37] Low growth control and management programs can affect housing prices indirectly by restricting supply and directly by increasing the costs of land development and construction.[38] A study conducted by Levine titled *The Effects of Local Growth Controls on Regional Housing Production and Population Redistribution in California* (1999) that measured various effects of growth management policy in the decade 1980-1990, found that jurisdictions with more growth-control measures (he studied a total of 18 different controls) "increased median rent levels more over the decade, approximately by $5 per enacted measure, increased median home values more—by about $2,360 per enacted measure, [and] showed faster increases in median household income—about $319 per enacted measure"[39] This study provides evidence that high(er) property values exist in the cities where growth control mechanisms are in place. This conclusion is supported by a number of studies; John D. Landis, et al., found that "local policies, programs, and actions that limit new housing production, whatever their form or purpose, adversely affect housing prices."[40]

Ozanne and Thibodeau, authors of *Explaining Metropolitan Housing Price*

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[37] Gerrit J. Knapp. "The Price Effects of Urban Growth Boundaries in Metropolitan Portland, Oregon." *Land Economics* 1, no. 61 (1985): 26-35.

[38] John D. Landis Lan Deng, and Michael Reilly. "Growth Management Revisited: A Reassessment of its Efficacy, Price Effects, and Impacts on Metropolitan Growth Patterns." *University of California Institute of Urban and Regional Development* (2002): 1-48.

[39] Ned Levine. "The Effects of Local Growth Controls on Regional Housing Production and Population Redistribution in California." *Urban Studies Journal Limited* 12, no. 36 (1999): 2047-2068.

[40] John D. Landis Lan Deng, and Michael Reilly. "Growth Management Revisited: A Reassessment of its Efficacy, Price Effects, and Impacts on Metropolitan Growth Patterns." *University of California Institute of Urban and Regional Development* (2002): 1-48.

Differences (1981), designed a model analyzing long-run supply and demand for metropolitan housing using data collected for 18 Standard Metropolitan Statistical Areas (SMSAs). Testing twelve variables, including income, population, two demographic variables, the price of agricultural land, the price of other goods, taxes, operating costs, mortgage rates, construction costs, the dispersion of municipal powers among local governments, natural geographic boundaries, and the (in)ability of government's to restrict land development, they were able to explain 90% of the variance in of the variation in rents between cities, and 60% of the variance in housing prices. Their most consistent finding was that "dispersion of municipal powers lowers the price of housing" and that "although not as important quantitatively, a proxy for development restrictions has proven to contribute to rent (and house price) differences."[41] In their conclusion they identified the influence of local development controls on price as an area of future research.

Stephen Malpezzi, author of *Housing Prices, Externalities, and Regulation in U.S. Metropolitan Areas* (1996) designed a study to determine the effects of regulations in land and housing markets and found "results to suggest that regulation raises housing rents."[42] Malpezzi uses the unweighted values of seven variables to construct proxies for the otherwise undefined variable 'regulation.'[43] First, he examines the change in approval time for zoning and subdivision single-family projects between 1983 and 1988 using a scale of 1-5; 1 being shortened considerably and 5 being increased considerably.

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[41] Larry Ozanne and Thomas Thibodeau. "Journal of Urban Economics." *Explaining Metropolitan Housing Price Differences* 13 (1983): 51-66.

[42] Stephen Malpezzi. "Housing Prices, Externalities, and Regulation in U.S. Metropolitan Areas," Journal of Housing Research 7, no. 2 (1996): 209-241.

[43] Ibid

Second, he estimates the time between application for rezoning and the issuance of a permit for a residential subdivision of 50 units or less using a similar 1-5 scale based on the number of months. Third is similar to the second, but for residential subdivisions of 50 or more units. Fourth, he examines the amount of land zoned for a single-family home in comparison to the amount desired using a scale from 1-5; 1 being acreage of land zoned is far more than demanded, and 5 being acreage of land zoned is far less than demanded. The fifth measure is similar to the fourth, the difference being multifamily housing. The sixth indicator is the percentage of zoning changes approved, again using a 1-5 scale; 1 representing 90-100 percent approval rates, 5 representing a 0-9 percent approval rate. The seventh—and final—measure of regulation used by Malpezzi is the Wharton scale for adequate infrastructure based on sewers and roads, and characterized by a 1-5 scale; 1 being 'much more than needed' and 5 being 'far less than needed'.

Each of the studies cited here measure land use regulation policy differently. Regulation is a particularly tricky variable to define and measure, mainly because there are so many different types of policies. In spite of this, there seems to be nearly uniform consensus among scholars that areas with stringent local land-use regulations have increased housing prices. Pollakowski and Wachter write, "the results of our study confirm results found elsewhere: land-use regulations raise housing and developed land prices within a locality."[44] Indeed, Nelson (1986) asserts that if there were no land market effects due to urban containment policies, the very effectiveness and role of these

[44] Henry O. Pollakowski and Susan M. Wachter, "The Effects of Land-Use Constraints on Housing Prices," *Land Economics* 66, no.3 (Aug. 1990): 315-24.

policies should be questioned.[45]

Amenity and Public Service Improvement

In *Growth Management Revisited,* Landis et al. studies California communities from 1980-1998, evaluating the implications of growth policy and found that "contrary to expectations, per capita expenditures [on public services; schools, community centers, city-specific projects] are generally higher in low growth control and management communities than in their peers."[46] Landis interprets this in two ways: first that growth is related only somewhat to expenditures on public goods, and secondly, since the communities most concerned with preserving their quality of life are also those most likely to adopt growth controls, they start from a position "of providing more, better, and thus more expensive public services."[47]

Displacement

As growth in regulated jurisdictions becomes more expensive for developers, neighboring communities may in turn experience displacement effects. Levine conducted a study of California communities from 1980-1990, concluding: "local growth-control or management measures appear to have reduced the number of housing units added during the 1980s either by actually reducing the units produced or, more likely, through shifting the production to jurisdictions with no or few measures."[48] He

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[45] Arthur C. Nelson, "Using Land Markets to Evaluate Urban Containment Programs." *Journal of the Amerian Planning Association* (1986): 156-71.

[46] John D. Landis Lan Deng, and Michael Reilly. "Growth Management Revisited: A Reassessment of its Efficacy, Price Effects, and Impacts on Metropolitan Growth Patterns." *University of California Institute of Urban and Regional Development* (2002): 1-48.

[47] Ibid

[48] Ned Levine. "The Effects of Local Growth Controls on Regional Housing Production and Population Redistribution in California." *Urban Studies Journal Limited* 12, no. 36 (1999): 2047-2068.

attributed 32% of all new housing units added between 1980 and 1990 as displaced due to restrictions on growth.[49] This growth burden placed on neighboring communities may be considered to be a disadvantage associated with development management.

Lack of Diversity

As housing costs increase, the number of low-income residents who are able to live in growth regulated areas decreases. Lower-income residents typically depend on rental housing—groups that tend to include minority populations. Levine's 1999 study illustrates the effects of regulation on diversity: jurisdictions with growth control policies in place experienced a smaller increase in the total non-white population—about 2187 fewer persons per enacted measure. [50] As a result, the area will be more homogenous.

Quality of Life

In spite of the common perception that cities with growth management policies provide a higher quality of living, Protash and Baldassare's 1977 study of California communities proves otherwise. They conducted a survey of 50 growing communities surrounding San Francisco and Sacramento where growth control measures are in place. The survey comprised of seven questions representative of "satisfaction with community attributes which are related to planning interventions" including growth problems, shopping problems, crime problems, transportation issues, noise satisfaction, satisfaction with present residence (hypothetically disregarding income), and personal well being.[51] Their results established, with the exception of one item, more growth controls are

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[49] Ibid

[50] Ibid

[51] Mark Baldassare and William Protash. "Growth Controls, Population Growth, and Community Satisfaction." *American Sociological Review* 3, no. 47 (1982): 339-346.

correlated with greater community dissatisfaction. This may be due to a number of underlying circumstances such as poor implementation of policy, or an inadequate amount of time to fully recognize the effects of policy. This study, although not in direct contradiction to Landis' 2002 study regarding public service improvement in growth management cities, does raise validity issues.

Summary:

This literature review has examined the history of the growth management movement, common reasons for governments to adopt policies, the types of policies, problems associated with implementing restrictions, and the known effects of local land use regulation. Studies have been able to conclude that regulations: affect the supply of available land, increase property values, improve public services and amenities, displace development onto neighboring communities with less restrictive policies, contribute to a lack of diversity, and a decreased quality of life.

Hypothesis:

On the basis of previous research, it is hypothesized that housing in Fort Collins will be less expensive than that of Berkeley or Boulder, that Fort Collins has experienced less growth than Berkeley or Boulder, that employees working in Fort Collins will be more apt to live in Fort Collins than those of Berkeley or Boulder, and that the quality of public goods is lower than that of Berkeley and Boulder. These variables will be discussed historically, within a case study framework, analyzing data from 1960 to 2000.

Chapter 1 explored the existing literature on this issue, namely addressing the history of the growth management movement, the reasons behind cities' adoption of policy, the different types of policy and their implications on various demographics. It

ended with three testable hypotheses. Chapter 2 will address the theory involved in answering each hypothesis. Chapter 3 will include data from the case studies of the three cities. Chapter 4 will analyze the case study data. Previous literature and theory will assist in and improve the analysis. Chapter 5 is reserved for concluding remarks, including the implications of this study and suggestions for further research.

CHAPTER II

THEORY

The purpose of this chapter is to examine the theory that will serve as a guide in the collection and analysis of the data. The hypotheses to be tested are threefold: first, that housing in Boulder and Berkeley will be more expensive than that of Fort Collins, second, that people working in Fort Collins will be more apt to live in the same county as their place of employment than those of Boulder or Berkeley, and third, that the quality of public services will be higher in Boulder and Berkeley than those provided in Fort Collins, all due to the presence of urban growth regulations. It is necessary to review the theory surrounding the U.S. housing market in order to explore the hypotheses developed in Chapter 1. Understanding the criteria that factor into this decision will illuminate the extent to which urban growth regulations affect housing options and ultimately choices for the consumer. The first section will examine the determinants of the price of housing. The second section will examine commuting and associated theories driving the second hypothesis of increased travel times. The third section will detail the theory of publicly provided services. The fourth section will detail a methodology for interpreting the data that will be discussed in Chapter III.

Price of Housing:

Granted that the housing market has some rather unique characteristics, this

analysis is aligned with the views of Correll, Lillydahl, and Singell (1978), assuming that "housing markets are at least workably competitive so that in the long run properties become assigned in accordance with maximum profit and utility conditions."[1] This is an important assumption to make because it allows for a straightforward economic analysis of supply and demand conditions in which consumers and firms attempt to maximize utility and profit, respectively.

Considering hypothesis number 1, that housing prices will rise as a result of local land use policies that serve to limit growth, it is important to understand the determinants of the price of housing. Essentially, home prices are determined through the interaction of supply and demand conditions, and ultimately depend on the elasticities of both:

> Any land use regulation regime can raise housing prices by increasing the demand for housing, decreasing the supply of housing, or increasing the rate of rent capitalization. The degree to which growth management policies affect housing prices depends on the *elasticities* of supply and demand—that is, the degree to which housing consumers or suppliers can escape from (or capture) the effects of growth management by migrating to (or from) other markets.[2]

Nelson et al. (2002) measure housing prices as a combination of five factors, such that:

$$P = \alpha + \beta_1 A + \beta_2 S + \beta_3 I + \beta_4 L + \beta_5 F + \varepsilon$$

where P is the price of housing
A is the agricultural value of the land
S is the structural value
I is the infrastructure value
L is the present location value
F is the future location value.

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[1] Mark R. Correll, Jane H. Lillydahl, and Larry D. Singell, "The Effects of Greenbelts on Residential Property Values: Some Findings on the Political Economy of Open Space," Land Economics 54, no. 2 (May 1978): 207-17.

[2] Arthur C. Nelson, Rolf Pendall, Casey J. Dawkins, and Gerrit J. Knapp, "The Link Between Growth Management and Housing Affordability: The Academic Evidence" [paper prepared for The Brookings Institution on Urban and Metropolitan Policy, Washington D.C., February 2002].

Each of these variables will be discussed to demonstrate the theoretical/intended effects of urban growth regulations.

Agricultural value is defined as the opportunity cost of using the land for agricultural purposes. Structural value is defined as the opportunity cost of construction. Growth regulations affect the structural value of a unit, adding to the price of housing if the policy increases the cost of resources. For instance, if regulation requires the use of specific materials or design standards, the developer incurs additional costs. Policies that force developers to provide affordable housing to low-income residents reduce profit margins and make construction less attractive. Programs that issue a certain number of permits each year may drive competitive bidding wars among prospective builders, causing them to beautify their plans in order to gain favor. Regulations limiting lot size, reducing tolerable densities or allowable building heights affect the price of housing by controlling the type or size of housing that may be built within a certain zone.

Infrastructure value is defined as the opportunity cost of providing public services such as roads, schools, police protection, and sanitation. Cities that pass adequate public facilities ordinances (APFOs) add to the infrastructure value by requiring developments to meet a certain set of standards regarding facilities, reducing the supply of new construction. Growth management programs that encourage higher densities or the infill of previously developed land lower the cost of infrastructure per unit by making use of already existing infrastructure.

Present location value is defined as the value of the location at the present time. Attractive features or benefits of the location, including proximity to employment, shopping, recreation etc, increase this value. Future location value is defined as the

predicted value of the location. Growth management programs can create exclusive communities, which increase demand as supply is speculated to remain constant. Programs can also increase demand by elevating the value of the entire region by making infrastructure improvements. In both instances, urban development policies increase the future location value.

In sum, Nelson et al. write that "both increases in demand and decreases in supply can increase the price of housing relative to incomes; but only increases in demand will make all residents and landowners better off (because wealth increases)."[3] The price of housing, while hardly the only supply side determinant in the US housing market, is the variable pertinent to this study. Other generally agreed upon (Ozanne and Thibodeau, 1981; Malpezzi, 1996) supply side factors include natural geographic constraints, and policy regulations.

This variable considers natural restrictions on growth, the principle barrier being oceans or large bodies of water, although mountains occasionally inhibit development as well.[4] This is an important variable to recognize since half of the 40 most populous cities in the United States are bound by oceans and lakes, significantly reducing the supply of available land.[5] Theoretically, a smaller amount of developable land, demand remaining constant, will cause the price of land and housing to increase. Rose (1986) calculates the supply of available land within or near an urban area using an index scoring metropolitan

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[3] Arthur C. Nelson, Rolf Pendall, Casey J. Dawkins, and Gerrit J. Knapp, "The Link Between Growth Management and Housing Affordability: The Academic Evidence" [paper prepared for The Brookings Institution on Urban and Metropolitan Policy, Washington D.C., February 2002].

[4] Lous A. Rose, "Urban Land Supply: Natural and Contrived Restrictions." *Journal of Urban Economics* 89 (1989): 325-45.

[5] Ibid

areas from 0 to 1; 0 being most restrictive and 1 meaning that bodies of water have no bearing on land supply. For instance, Honolulu's index is 0.470, indicating that its supply of urban land is 47% of what would be available in the absence of water restrictions.[6] Growth regulations also serve to limit the supply of housing, and have been found to reduce the supply of available land open to development by 10%.[7]

Place of Residency and Place of Employment

Considering the second hypothesis, that employees of Boulder and Berkeley will be unable to afford to live in the same place as they work, this section will review theories pertaining to the travel time to work. Theoretically, if residents work and live in the same city, then urban growth boundaries, which restrict sprawl, should place employees closer to their place of work. However, since urban containment policies also encourage higher densities, there is the possibility of negative congestion externalities as traffic increases in an urban area where development is largely restricted. Dawkins and Nelson (2002) cite Cho's 1997 study of greenbelts in Seoul, South Korea, which argues, "amenity effects associated with greenbelt policies may be offset in the long run by increases in congestion externalities attributable to increasingly higher development densities."[8]

Furthermore, if housing prices do in fact increase as a result of regulation, it could force employees with lower incomes outside of the city in which they are employed. Often, these are public service employees, such as teachers, police and firemen, or local

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[6] Ibid

[7] Junjie Wu and Seong-Hoon Cho. "The Effect of Local Land Use Regulation on Urban Development in the Western United States." *Regional Science and Urban Economics* 37 (2007): 69-86, www.sciencedirect.com [accessed February 1, 2010].

[8] Casey J. Dawkins and Arthur C. Nelson, "Urban Containment Policies and Housing Prices: An International Comparison with Implications for Future Research," Land use Policy 19 (2002): 1-12.

government officials. Their civil servant professions require knowledge of the area to be effective employees, and this knowledge is easier to acquire and process as residents of the same city. Increased property values may cause such residents to be "pushed" out of the city, and become commuters into the center, only causing congestion to increase further. Moreover, as residents who can no longer afford to live in the city are forced out, they are sacrificing all of the infrastructure value that "pulled" them in, such as proximity to shopping, jobs, and entertainment, as well as public transportation.

Public Service and Amenity Effects

The preservation of the quality of publicly provided services are often cited as major reasons for the adoption of local growth controls. Higher quality services cause demand for regulated housing environments to increase. This is especially relevant in communities that adopt a greenbelt, characterized by Dawkins and Nelson (2002) as a 'localized amenity,' referring to the open space benefits conferred to homeowners and renters with access to this open space.[9] In addition to localized amenities are 'regional amenities' which "include increased efficiency in the provision of public services and infrastructure, a sense of place that is associated with compact, contiguous urban forms, and increased accessibility due to the closer proximity between housing and neighboring commercial and recreational land uses."[10] If, however, "central city disamenities such as crime, poor schools, and poor infrastructure exert a 'push-factor' that increases the demand for non-urban housing, new housing prices will continue to rise in areas where

[9] Casey J. Dawkins and Arthur C. Nelson, "Urban Containment Policies and Housing Prices: An International Comparison with Implications for Future Research," Land Use Policy 19 (2002): 1-12.

[10] Ibid

land is likely to be the cheapest: the suburbs and exurbs."[11]

No study has been done to date measuring the effect to which regulation improves or diminishes the quality of public services in the form of police, fire, or transportation quality. Theoretically, these goods could be influenced either way. If the regulations in place direct enough funding to these goods, then the quality is preserved. On the other hand, if the regulations in place do not properly account for increased densities (and therefore the necessity for increased resources), then the quality of these goods is sacrificed as overcrowding and under-funding diminish their effectiveness.

Summary of Theoretical Concepts

This chapter has outlined the expected effects of regulatory policy on housing prices, commute times, and public services. Urban growth regulation is predicted to increase housing prices through a combination of policies that affect the five determinants of price. Commute times are expected to rise as more employees are forced out of the city center and congestion increases. The effect of regulation on the quality of public services is undetermined. The theoretical approach that will be taken to address and answer each hypothesis follows below.

Method for Evaluation

This thesis uses a case study approach to answering each of the hypotheses. Data describing the regulatory environment will be collected for each of the three cities over a time span of 58 years, beginning with 1960 census data. Similar to the approach taken by Black and Hoben (1985)[12] and Guidry, Shilling, and Sirmans (1991)[13], this study will

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[11] Ibid

[12] J. Thomas Black and James Hoben, "Land Price Inflation." *Urban Geography* 6, no. 1 [1985]: 27-49.

examine the regulatory environment and establish a continuum describing the relative strength of local land use restrictions in each of the cities. Collected data variables that affect each of the cities will be disregarded with the expectation that they will similarly bias all communities. Additionally, if each community has the same (or very similar) policy, then analysis cannot be complete without addressing implementation issues, which are assumed to be the same throughout each city. Once the restriction continuum is established, data will be collected that describes the price of housing, travel times to work, and the provision of public services. These will be examined in light of the continuum, identifying possible effects that regulation has on these variables over time.

While this is hardly a formal theory, it should be recognized that there is little consensus between scholars on an appropriate method for the analysis of local land use regulations in determining discernible effects. Nelson et al. write, "For the most part we find that the literature surrounding the housing market effects of growth management policies is one characterized by many facts in search of a unified theory."[14] Indeed, in the literature discussed in this and the previous chapter, no two studies have been conducted in the same manner. Certainly no two studies have used the same variables to determine regulatory policies. Thus, the theory laid out here aligns with other theories. It provides a launching point for the data and analysis that follows in Chapter III.

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[13] Krisandra A. Guidry, James D. Shilling, and C.F. Sirmans, "An Econometric Analysis Variation in Urban Residential Lnd Prices and the Adoption of Land-Use Controls." Working Paper: *University of Wisconsin Center for Urban Land Economics,* [1985].

[14] Arthur C. Nelson, Rolf Pendall, Casey J. Dawkins, and Gerrit J. Knapp, "The Link Between Growth Management and Housing Affordability: The Academic Evidence" [paper prepared for The Brookings Institution on Urban and Metropolitan Policy, Washington D.C., February 2002].

CHAPTER III

DATA AND METHODOLOGY

This chapter discusses the collected data that will be analyzed in Chapter IV, according to the theoretical framework presented in Chapter II. With the hypotheses of this paper in mind, this chapter will first discuss variables pertaining to housing stock and quality—the supply side variables of the housing market. Second, it will discuss the demand side variables, namely variables describing distance/travel time to work and public services provided. Third, it will discuss variables contributing to the regulatory environment of each city.

Data Sources

The data for this analysis is provided by the decennial Census, City and County Data Books, Housing and Urban Development (HUD): State of the Cities Database, Construction Industry Research Board and the American Housing Survey (formerly the Annual Housing Survey). The majority of regulation data is collected from city and county government websites detailing their policies, past and present. Ordinances and laws are recorded in each city's clerks office and are available online through their respective government websites.[1,2,3]

[1] City of Berkeley Government Website, "City of Berkeley, California.," http://www.ci.berkeley.ca.us/planning/ [accessed February 2, 2010].

A rather unique part of this paper is its' historical case study approach to urban growth regulation with the aim of capturing any long term effects on the price of housing, commute times, and public services as measured by the number of police per city studied. Thus, the data collected begins with the year 1960 and ends at year 2008, encapsulating a time span of nearly fifty years, in which numerous restrictions and regulations were passed and put into place in the three communities: Boulder, Berkeley, and Fort Collins. The availability of data for 2008 varies since not all counts are annually recorded.

Supply Side: Housing Stock and Quality

The Census provides data on the total number of housing units in each community studied. The Census Bureau defines a housing unit as a house, an apartment, a mobile home or trailer, a group of rooms or a single room occupied as separate living quarters. A housing unit is further characterized as vacant or occupied. Occupancy characteristics are important in this study because they detail how much housing is available for rent/purchase at the time of the Census.

In examining densities, the Census measures the number of persons living per occupied unit and computes persons per room. Persons per room is the average number of people living within a unit divided by the number of rooms available. The number of people living per room and per housing unit is important to this research because it indicates housing density. Another measure of density is the number of units in the structure. This variable is relevant because it shows housing development trends as the needs of each city change. For example, communities may be more inclined to construct

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[2] City of Boulder Government Website, "City of Boulder, Colorado," http://ci.boulder.co.us/ [accessed February 2, 2010].

[3] City of Fort Collins Government Website, "City of Fort Collins, Colorado," http://www.fcgov.com/ [accessed February 2, 2010].

multi-family structures as opposed to additional single-family housing units to better accommodate lower income families or to encourage higher densities. These trends may be affected by zoning or regulation policies. Furthermore, population and housing densities can be computed as the land area of the city changes. The total land area of the city may change as its service area expands, as it did with Fort Collins, or as the city acquires additional open space, as is the case with Boulder.

The value of each housing unit, in both homeowner and renter terms, is collected. They are measured by "owner-specified" values and "rent contracted" values. Additionally, data is collected on the median housing prices for sale and the median rent asked for vacant units. These variables are important in the analysis because they describe the price and cost of housing. As previously mentioned in Chapter II, the price of housing directly affects who can afford to live within the city. Furthermore, as prices are determined by the supply and demand of city housing, prices reflect and measure how desirable a community may be to live.

The final supply-side variable considered in the data is the year the structure was built. This variable is especially important in this analysis because it highlights how many houses were built in a certain period (eg. for the 1980 Census: measured from 1970-1974, 1975-1978, 1979-March 1980) and may provide evidence as to how regulation affects the number of new housing units supplied. Table 3.1 is a list comprised of all the supply-side variables.

Table 3.1: Supply-Side Variables Summarized

Variable	***Defined***	***Indicates***
Total # of Housing Units	Measures the total number of housing units per place	The total stock of housing units per place
Land Area	The total amount of land in place measured in square miles	Land Area
Housing Density	Measures the amount of housing units per square mile	Density
Population	Total number of persons per place	Population
Population Density	Measures the number of persons per square mile	Density
Occupancy Status	The number of housing units characterized as occupied or vacant	Housing units available
Persons per Housing Unit	Total number of people living in each housing unit	Density
Persons per Room	Average number of persons living in each room	Density
Units in Structure	The number of housing units per structure	Density
Values: Homeownership	Owner-specified value of housing unit	Price of housing
Values: Renters	Amount of rent contracted per month	Price of housing
Year Structure Built	The year a housing structure was finished/ becomes available to occupy	Development and supply of new housing units

Source: Author

Total Number of Housing Units

As previously intoned, this variable measures the total quantity of housing units per community studied. The table below displays the total number of housing units and the total number of housing units per square mile, indicating density. Before examining housing densities, it is first necessary to show changes in land areas over time. These changes are shown in Table 3.2 below, followed by Table 3.3 describing housing unit

totals and density.

Table 3.2: Land Area Measured in Square Miles

	BOULDER	*BERKELEY*	*FORT COLLINS*
1960	7.10	9.7	6.1
1970	13.00	10.6	10.8
1980	18.75	10.9	21.5
1990	18.75	10.5	41.2
2000	18.75	10.5	46.5
2008	18.75	10.5	47.1

Source: US Census Bureau. 2008 data from city governments.

Although it will be explained in greater detail later in the chapter, it is very important to note that although the total land area of the City of Boulder has increased, shown by the values in the parentheses, its service area and land available for development has remained largely unchanged since the 1970's as a result of the imposition of its urban growth boundary in 1967.[4] According to "Growth Management in Boulder, Colorado: A Case Study," composed by five Boulder government officials including the Director of Planning, Peter Pollack, the total area of the city of Boulder available to development/improvement is 12,000 acres, or 18.75 square miles.[5] This value then replaces the total land area reported by the US Census in years 1980-2008 and provides a better indicator of housing and population densities.[6]

[4] City of Boulder Government Website, "City of Boulder, Colorado," http://ci.boulder.co.us/ [accessed February 2, 2010].

[5] J. N. deRaismes, H. L. Hoyt, P. L. Pollack, J. P. Gordon, D. J. Gehr. "Growth Management in Boulder, Colorado: A Case Study," *sponsored by the City of Boulder, CO.*

[6] Total land area values (as reported by the US Census) are 19.5, 22.6, 24.4, and 25.48 for 1980, 1990, 2000, and 2008, respectively.

Table 3.3: Total Number of Housing Units and Housing Units Per Square Mile: Housing Density

	BOULDER		*BERKELEY*		*FORT COLLINS*	
	Total # Units	Units/ sq mi.	Total # Units	Units/ sq mi.	Total # Units	Units/ sq mi.
1960	11537	1625	42568	4285	7951	1303
1970	21585	1660	47364	4468	13838	1281
1980	30287	1615	46334	4251	25354	1179
1990	36270	1934	45735	4356	35357	858
2000	40276	2148	46875	4464	47766	1027
2008	41177	2196	46635	4441	60505	1285

Source: US Census Bureau

As evidenced in the table, the two Colorado cities, Boulder and Fort Collins, experienced positive growth in the total number of housing units every year reported, whereas Berkeley experienced a decrease in the number of housing units available in 1980 and 1990. Berkeley has a generally increasing density, with the exception of the years 1980 and 2008. The fluctuations in Berkeley's housing density are due to changes in housing supply. Housing density in Boulder follows the same pattern as Berkeley; that is, Boulder has generally increasing density, with the exception of 1980. Fort Collins has a decreasing density 1960-1990 mainly due to its increases in land area, and increasing densities in 2000 and 2008 caused principally by the increase in the number of housing units constructed.

Total Population and Population Densities

The Census Bureau counts population by calculating the number of people who spend the majority of their time in a certain geographic area. This number may be different than the number of residents registered (or able to register) to vote or where a person pays their taxes. Table 3.4 below shows the population of the three cities and their respective population densities, as measured by the total number of persons living in

the city divided by the land area in square miles. Boulder and Fort Collins experienced only positive growth but different patterns of population densities. Berkeley's population decreased overall as did the population per square mile.

Table 3.4: Population and Population/Square Mile

	BOULDER			***BERKELEY***			***FORT COLLINS***		
	Population	Population Growth Rate (%)	Population / Sq Mile	Population	Population Growth Rate (%)	Population / Sq Mile	Population	Population Growth Rate (%)	Population / Sq Mile
1960	37718		5312	111268		11470	25027		4102
1970	66870	77.29	5143	116689	4.87	11008	43368	73.28	4015
1980	76685	14.68	3932	103328	-11.45	9479	65092	50.09	3027
1990	83312	8.64	3686	102274	-1.02	9740	93335	43.39	2265
2000	102743	23.32	4210	94673	-7.43	9016	118652	27.12	2551
2008	98238	-4.38	3855	109612	15.78	10439	140497	18.41	2983
average		23.91			0.15			42.46	

Source: US Census Bureau and Authors Calculation (Population Growth Rate)

Since all three of the cities examined are university towns, it is important to note that college students are counted as residents of the area in which they live while attending school. University students have certain characteristics that distinguish them from the regular population that need to be mentioned. First, college students are more apt to live in dormitories or apartment buildings than the general population. These buildings are characterized "multi-family housing structures" by the US Census Bureau, and thus are probably more prevalent in the three cities studied than those cities without universities and large student populations. Second, university students generally have roommates and tend to live in closer quarters. This will influence the number of persons per room and number of persons per housing unit. Third, university students tend to view their time at college—and in their university town—as temporary and therefore are more likely than the general population to rent as opposed to own. This will influence tenure

statistics. Fourth, college students (individual from their families) typically have lower incomes than the rest of the population, and thus may influence the number of affordable housing units needed in the city as well as income statistics. Fifth, most students have strong preferences to live in the same city as their university and thus aren't likely to move if costs increase. Last, because all three cities have large universities that must accommodate the needs of their students, the data is similarly biased for all three communities. Table 3.5 below shows each city's principal university, its' corresponding total student population, and university students as a percentage of the total population.

Table 3.5: Principal University Populations

	BOULDER: *University of Colorado: Boulder*			***BERKELEY*** *University of California: Berkeley*			***FORT COLLINS*** *Colorado State University: Fort Collins*		
	Total Student Population	Total Population	Percent of Total Population	Total Student Population	Total Population	Percent of Total Population	Total Student Population	Total Population	Percent of Total Population
2000	28373	102743	27.6	31347	94673	33.1	22782	118652	19.2
2008	31470	98238	32.0	34953	109612	31.8	27569	140497	19.6

Sources: University of Colorado, University of California, Colorado State University

Occupancy Status

Occupancy status details the amount of housing that is characterized as vacant or occupied. A housing unit can be termed vacant in a variety of ways: it may be available for sale only, for rent only, it can be rented or sold and is awaiting occupancy, held for occasional use, and held for other reasons. In this analysis, occupancy status is relevant because it is an indicator of the number of housing units available per community at a particular point in time.

Table 3.6: Vacant Housing Units as a Percentage of Total Housing Units

	BOULDER	*BERKELEY*	*FORT COLLINS*
1960	5.5	4.5	4.3
1970	2.6	3.6	5.2
1980	5.0	3.4	7.2
1990	4.3	4.9	4.7
2000	2.8	4.0	4.0
2008	3.5	8.7	4.9

Source: Census Bureau and the 2006-2008 American Community Survey

Average vacancy rates in Boulder are 3.95, in Berkeley are 4.85, and in Fort Collins are 5.05, meaning that Boulder typically has the least amount of vacant housing units available while Fort Collins typically has the most.

Density Measures

There are many different methods for measuring density. Persons per housing-unit is a measure of the total number of people occupying a housing unit and is summarized below in Table 3.7. Unfortunately, 2008 data is not available for this variable.

Table 3.7: Average Number of People per Occupied Unit

	BOULDER	*BERKELEY*	*FORT COLLINS*
1960	3.00	2.60	2.90
1970	2.80	2.30	2.80
1980	2.40	2.11	2.50
1990	2.18	2.10	2.44
2000	2.20	2.16	2.45

Source: US Census Bureau.

As can be seen from the table above, each city has a decreasing average of people per unit every year except 2000, when the number of people per unit increases slightly. There is no real explanation for this increase. It may be that additional people per unit is

a result of each cities growth. It also may reflect limitations of supply or pressures to increase density.

A good measure of density per unit is the number of people per room and is summarized below in Table 3.8 for renter occupied units. Rented homes provide a better indicator of changes because these units have higher turnover rates than owner occupied units. 2008 values are not available for this variable. The Census measures 1960 data differently; the "1.51 or more" bracket was not defined, but rather data is clumped together into a single bracket "1.01 or more."

Table 3.8: Renter Occupied Persons Per Room as a Percentage of Total Renter Occupied Units

	BOULDER	***BERKELEY***	***FORT COLLINS***
0.50 or less			
1960	33.6	44.4	33.6
1970	41.9	51.0	46.9
1980	57.8	61.3	62.5
1990	54.4	59.3	64.2
2000	57.0	51.4	60.3
0.51-1.00			
1960	54.4	49.0	56.0
1970	52.5	43.7	47.5
1980	38.9	34.6	34.5
1990	34.2	33.9	32.5
2000	36.7	39.2	35.5
1.01-1.50			
1960	11.9	6.5	10.3
1970	1.8	1.2	2.7
1980	1.6	1.9	2.0
1990	2.0	2.7	2.1
2000	2.9	3.3	2.3
1.51 or more			
1960	-------	------	------
1970	2.4	2.2	1.9
1980	1.7	2.1	0.9
1990	1.9	4.0	1.2
2000	3.3	6.1	1.9

Source: US Census Bureau

Price/Cost of Housing Variables

The price/cost of housing is extremely important in this paper, considering the first hypothesis: housing will be more expensive in the regulated areas of Berkeley and Boulder. The Census provides data for the median value of houses, the median price asked for sale units, the median contracted rent, and the vacant for rent median price asked. The values reported here have been adjusted for inflation by the author using the US Bureau of Labor Statistics Inflation Calculator which uses average consumer price indexes for a given calendar year, are reported in 2008 dollars, rounded to the nearest dollar.[7]

Table 3.9: Median Value of Owner Occupied Units, in 2008 Dollars

	BOULDER	***BERKELEY***	***FORT COLLINS***
1960	116,380	120,744	97,468
1970	129,848	147,605	107,097
1980	224,709	251,884	177,155
1990	202,125	429,947	136,067
2000	340,333	467,990	205,050
2008	366,051	752,000	244,700

Sources: US Census Bureau and 2006-2008 American Community Survey

As is possible to see from the table, the values of owner occupied homes were within $25,000 of each other, between cities, in 1960. Values increase in each city, each year, excepting a decrease in 1990 in both Boulder and Fort Collins. That both of the Colorado communities had decreased values in 1990 is in accordance with the rest of the state—the Colorado state median value was $126,900 in 1980 and dropped to $105,700 while California and national medians continued to rise in this same period. In 2008, the American Community Survey reports median home values in Berkeley (still the priciest

[7] Inflation Calculator, Bureau of Labor Statistics, http://data.bls.gov/cgi-bin/cpicalc.pl [accessed March 31, 2010]

community) to be $752,000—a full $507,300 more than Fort Collins, where the median home price is reported at $244,700. This evident discrepancy increases between the communities each year: Berkeley always has the highest median home values, Boulder is always in the middle, and Fort Collins always has the lowest reported values.

Median contracted rent is adjusted for inflation using U.S. Bureau of Labor Statistics' online inflation calculator and summarized in Table 3.10 below.

Table 3.10: Median Contract Rent, in 2008 Dollars

	BOULDER	***BERKELEY***	***FORT COLLINS***
1960	596	589	495
1970	716	710	605
1980	734	583	606
1990	789	733	621
2000	966	865	804
2008	909	1,098	750

Sources: US Census Bureau and 2006-2008 American Community Survey

While median home values are consistently highest in Berkeley and lowest in Fort Collins, median contracted rent varies between the communities depending on the year. Fort Collins continues to have the lowest median contracted rent each year with the exception of 1980, when it has higher rents than Berkeley. Berkeley passed a rent stabilization ordinance in 1980, accounting for its lower prices. Boulder's rents are higher than Berkeley's between 1960-2000, but are lower in 2008.

Development Indicators

The Census takes data on the year the structure was built. This variable is particularly valuable because it measures the amount of new housing within each community. The following table provides a general picture of the development trend showing the percentage of homes built in a certain time period.

Table 3.11: Year Structure Built as a Percentage of Total Structures

	BOULDER	BERKELEY	FORT COLLINS
1939 or earlier	11.4	57.3	7.0
1940-1949	2.5	7.8	1.5
1950-1959	10.0	10.3	3.7
1960-1964	10.0	8.6	3.4
1965-1968	9.7	4.2	4.5
1969-March 1970	2.7	1.3	1.7
1970-1974	12.5	2.5	8.2
1975-1978	6.6	0.6	6.6
1979-March 1980	2.4	0.3	3.7
1980-1984	8.4	0.9	8.8
1985-1988	6.4	0.8	7.4
1989-March 1990	1.1	0.3	1.4
1990-1994	1.2	0.2	4.0
1995-1998	3.2	0.8	10.2
1999-March 2000	6.3	1.0	8.4
2000-2004	3.6	2.4	14.6
2005-2008	1.3	0.5	4.7

Source: US Census Bureau

As can be seen in the table above, the majority of Berkeley's development took place before 1939, whereas Boulder and Fort Collins were only 11.4 and 7.0 percent developed, respectively. Berkeley continued to build structures so that by March 1970, 89.5 percent of existing buildings had been constructed. This suggests an early build-out of Berkeley. Boulder's pattern of development suggests a slower build-out—by March 1970 only 46.3 percent of buildings had been constructed. Boulder continued to build, but increasingly slower each decade: 21.5 percent of existing buildings were constructed between 1970 and 1980, 15.9 percent between 1981 and 1990, 10.5 percent between 1991 and 2000, and 4.9 percent between 2001 and 2008. This is contrasted by the development pattern of Fort Collins, which developed consistently until the 1970s when it experienced a construction boom, prior to which only 21.8 percent of buildings had been built. Between 1970 and 2008, Fort Collins built an average of 19.5 percent of its

structures each decade. It is clear that Berkeley developed first, followed by Boulder, and then by Fort Collins.

Demand Side: Income, Tenure Choice, Proximity to Work, and Public Amenities

The Census provides a multitude of statistics describing income. This analysis focuses on median household incomes, which measures the income of the householder and all other individuals 15 years old and over in the household, regardless of relationship to the householder. Income is measured for a 12-month period. Median household income data is not available for the year 1960, as this statistic was first collected in 1967. This variable is important to the analysis because income is a major component of the consumers' budget constraint and is a demand side determinant.

The Census provides data for the number of workers per community and how many are working "within the area" and "outside of the area." Unfortunately, the US Census varies almost every ten years, and also varies between cities, in its definition of 'area.' This inconsistency of the data makes comparisons and analysis difficult. For instance, in 1960 Boulder and Berkeley were both categorized as within a standard metropolitan statistical area (SMSA) and thus the data collected for those two cities defines "area" as within the SMSA whereas the area for Fort Collins is Larimer County. Furthermore, unlike the 1980 Census, place of work data for the 2000 and 1990 Census don't include a column for 'non-response' and instead, places of work are distributed and estimated among specific place-of-work destinations.[8] For these reasons, the place of work data is unreliable and this analysis will therefore focus on mean travel time to work, which is reported beginning in 1980. This variable is especially important to consider

[8] Commonwealth of Massachusetts, Executive Office of Labor and Workforce Development, *Definitions for Journey to Work Data,* 2008, http://lmi2.detma.org/Lmi/lmidefinitions.asp [accessed March 31, 2010].

since it is hypothesized that commute distance and times are negatively affected by regulation and therefore affect the demand for housing.

Table 3.12: Demand Side Variables Summarized

Variable	***Defined***	***Indicates***
Income	Median income per household	Housing units' wealth
Proximity to Work	Mean travel time to work	Commute Times
Public Services	Police, Sewers/Sanitation and Highway Spending	Quality of Public Services

Source: Author

Income

As previously noted, income is a major demand-side component; it determines the consumers' budget constraint. The Census provides much data on income, and records wealth and income in many different ways. This analysis focuses on median income per household. Summary statistics follow in Table 3.13.

Table 3.13: Median Household Incomes in 2008 Dollars

	BOULDER	***BERKELEY***	***FORT COLLINS***	***United States***
1970	63,464	55,396	49,381	48,465
1980	43,277	35,224	41,304	46,274
1990	48,055	48,243	43,493	49,325
2000	55,611	55,619	55,587	52,500
2008	66,463	59,355	49,662	50,303

Source: US Census Bureau and the American Community Survey

The table above shows median household income for each city, and for comparisons sake the United States national median is also included. It is possible to see that each of the three cities had incomes greater than the national average in 1970 and incomes lower than the national median in 1980 and 1990. In 2000 and 2008, Boulder and Berkeley both

pulled above the US median, whereas Fort Collins managed to do this only in year 2000. Furthermore, 2008 incomes in Boulder and Berkeley were nearly $10,000 greater than those in Fort Collins. Perhaps a more useful indicator of the cost of living is examining the relationship between median incomes and the median contract price of rents to determine what percentage of income is spent on housing. To do show this, median contract rents are multiplied by 12 to find the annual value and are then divided by median household incomes. These numbers are computed and shown in Table 3.14 below.

Table 3.14: Percentage of Income Spent on Rent

	BOULDER	***BERKELEY***	***FORT COLLINS***
1970	13.5	15.3	14.7
1980	20.3	19.8	17.6
1990	19.7	18.2	17.1
2000	20.7	18.6	17.4
2008	16.4	22.1	18.1

Source: Author's Calculation, data from US Census Bureau and the American Community Survey

As can be seen in the table, the income spent on rents ranges from a low of 13.5% in Boulder in 1970 to 22.1% in Berkeley in 2008. While this information does provide a good indication of housing as a percentage of income, it must be noted that median incomes for renter occupied units tend to be lower than the median incomes for all occupied units. If these statistics could be computed using median incomes for renter occupied units, it is expected that the percentages would be higher. Additionally, these statistics would be computed for owner occupied units, however data on mortgages is not collected until 1980.

Proximity to Work

'Journey to Work' data was first collected by the Census in 1960. Although the headings have changed since then to accommodate for public transportation and mean commuting time, residents working inside and outside of "the area" have been reported for all years. As previously discussed above, these numbers were found to be unreliable and therefore are not included in this analysis, which will instead sacrifice 1960 and 1970 values and will focus on average commute times, as reported beginning in 1980.

Table 3.15: Average Travel Time to Work in Minutes

	BOULDER	***BERKELEY***	***FORT COLLINS***
1980	18.3	23.7	14.8
1990	17.9	24.1	16.4
2000	18.8	27.8	18.5
2008	22.0	25.7	19.0

Source: US Census Bureau and the American Community Survey

As is shown in the table above, each city reports increased commute times. Residents of Berkeley spend the most time traveling to work while residents of Fort Collins spend the least. In the span of 38 years, average travel times to work increased by 3.8 minutes in Boulder, 2 minutes in Berkeley and 4.2 minutes in Fort Collins.

Public Services

In light of the third hypothesis, that public services provided to residents will be higher in communities with increased growth regulation, it is necessary to review general spending policies of the three cities studied. Unfortunately, 2008 data is not available for these statistics. The first table below shows the general revenue and total government expenditure per capita, adjusted for inflation and reported in 2000 Dollars.

Table 3.16: General Revenue and Total Expenditure per Capita in 2000 Dollars

	BOULDER		***BERKELEY***		***FORT COLLINS***	
	Revenue	Expenditure	Revenue	Expenditure	Revenue	Expenditure
1960	295.53	225.95	466.10	425.38	235.67	252.89
1970	451.31	471.20	760.70	726.44	306.99	306.99
1980	1,002.88	918.39	1,162.98	1,223.60	847.58	831.51
1990	1,222.95	1,192.41	1,701.91	1,751.75	1,057.03	1,018.88
2000	1,164.06	1,090.45	1,780.24	1,882.94	976.85	927.33

Source: US City and Code Books

As is possible to see from the table above, Boulder and Berkeley have consistently higher revenues and higher spending than Fort Collins. Granted, expenditures can be spent in an infinite number of ways and there is no recognized way to know if money is being spent efficiently or inefficiently. While this does provide an idea of general spending patterns, these variables alone are not totally indicative of the level of public services provided. Moreover, there is no general consensus on what constitutes quality public service delivery. However, it is possible to compare cities on the percent of revenues spent on certain publicly consumed goods, such as the police department, highways, and sewage and sanitation. The tables below summarize police department statistics; the first column shows the number of residents per 1 police officer, the second column shows government spending on police as a percentage of total expenditures. Unfortunately, data is not available for Fort Collins in 1970 and 1970 data for government revenue spent on police includes expenditures on the fire department as well.

Table 3.17: Number of Police Officers per Capita and Government Spending on Police Department per Capita

	BOULDER		***BERKELEY***		***FORT COLLINS***	
	Residents per Police Officer	Government Spending on Police Dept.	Residents per Police Officer	Government Spending on Police Dept.	Residents per Police Officer	Government Spending on Police Dept.
1960	1019.4	16.8	751.8	15.4	...	10.2
1970	815.5	16.7*	542.7	30.2*	1084.2	24.7*
1980	730.3	8.6	630.0	11.1	845.4	12.6
1990	682.9	13.7	574.6	14.3	906.2	12.3
2000	638.2	12.4	480.6	14.8	859.8	12.6

Source: US City and County Data Books
*Includes expenditures on fire departments as well

Table 3.17 above shows the number of persons for each police officer. It must be noted that the large universities located in each city also have their own police departments that are devoted to the safety and welfare of the student population (See Table 3.5 for student populations). As demonstrated, Berkeley consistently has the highest number of police officers for its population, while Fort Collins consistently has the lowest. One issue with examining police force data without looking at crime, is that it is impossible to know which community is actually safest; that is, it may be that Berkeley has the highest proportion of police officers relative to population because there is a greater need for police protection. Thus, the following table details the crime index rate in each city.

The crimes included in the index—murder, forcible rape, robbery, aggravated assault, burglary, larceny $50 and over in value, arson, and auto theft—are considered to be most consistently reported to the police, and are represented by number totals as "offenses known to police."[9] These statistics are collected by the US Bureau of Justice

[9] U.S. Department of Justice, *Uniform Crime Reports for the United States.* Washington, DC: Government Printing Office, 1970.

and are unavailable for cities in 1960.

Table 3.18: Crime Rate (Offenses Known to Police) and Offenses per capita

	BOULDER		***BERKELEY***		***FORT COLLINS***	
	Number of Offenses Known to Police	Offenses per capita	Number of Offenses Known to Police	Offenses per capita	Number of Offenses Known to Police	Offenses per capita
1960	...		...		...	
1970	3,209	0.048	6,442	0.055	1,032	0.024
1980	6,354	0.083	13,000	0.126	1,892	0.029
1990	6,041	0.073	12,673	0.124	4,796	0.051
2000	3,571	0.035	7,688	0.081	4,876	0.041
2008	3,114	0.032	7,489	0.068	5,156	0.037

Source: Bureau of Justice Statistics: Uniform Crime Reports

As shown in the table above, Berkeley's rate of crime per capita is consistently highest, giving reason to the city to provide more police officers. It is possible to see the national crime wave of the 1980s in the table above, as the crime rate in both Boulder and Berkeley soared to record highs.

The following table details the amount of money spent on sewers and sanitation as a percentage of total expenditures and per capita.

Table 3.19: Per capita Spending on Sewers/Sanitation (in 2000$) and Percentage of Total Expenditures Spent on Sewers/Sanitation (%)

	BOULDER		***BERKELEY***		***FORT COLLINS***	
	Per Capita Spending ($)	% Government Spending on sewers/sanitation	Per Capita Spending ($)	% Government Spending on sewers/sanitation	Per Capita Spending ($)	% Government Spending on sewers/sanitation
1960	18.62	8.3	53.52	8.3	38.98	8.3
1970	66.57	14.1	62.58	8.2	30.18	9.8
1980	74.40	8.1	74.61	6.1	98.85	11.9
1990	77.47	6.5	180.37	10.3	200.66	19.7
2000	63.20	5.8	306.90	16.3	111.30	12.0

Source: City and County Data Books

As can be seen from the table above, spending on sanitation/sewers varies between the years as a percentage of government spending, and varies between each city as expressed in per capita terms. One disadvantage of this data is that values aren't reported annually, only decennially, and express the value for that year only. Because this is the case, it may be that some cities require greater spending in certain years to improve their system, while other years require lesser spending. For example, in 1990, Fort Collins spent 19.7 percent of total government expenditures on sanitation/sewers, a figure almost 8 percent higher than in both 1980 and 2000. A decennial average would better display spending patterns. Unfortunately, data is not available for all years, making this impossible.

The final public service variable to be examined is expenditures spent on highways. This is summarized in Table 3.20 below as both a percentage of government expenditures and also in per capita terms.

Table 3.20: Per capita Spending on Highways (in 2000 $) and Percentage of Total Expenditures Spent on Highways (%)

	BOULDER		***BERKELEY***		***FORT COLLINS***	
	Per Capita Spending	Government Spending on Highways	Per Capita Spending	Government Spending on Highways	Per Capita Spending	Government Spending on Highways
1960	25.02	11.1	41.89	9.7	69.81	27.6
1970	116.28	24.7	91.43	12.6	41.27	13.5
1980	185.57	20.2	72.10	5.9	166.35	20.0
1990	170.49	14.3	205.01	11.7	139.53	13.7
2000	152.70	14.0	129.90	6.9	205.90	22.2

Source: US City and County Data Books

In examining the table above, it is possible to see that spending varies between the years as a percentage of government expenditures, and also varies between the cities in per capita spending, similar to the (lack of) pattern previously observed in Table 3.19. The same disadvantage applies here: values represent one year spending only and do not

provide a picture of average expenditures. It also may be that some cities' highways require a greater amount of improvements or that some cities have more highways to maintain. For example, Fort Collins spends the most (both as a percentage of total expenditures and per capita) in 2000, but may also have the greatest need for spending since I-25, a major interstate, runs through the city. However, this is not possible to determine exactly.

A general disadvantage to this public service data is that spending, while obviously related, does not lead to direct measures of the quality of services provided. Unfortunately, there is no good way of detailing this kind of quality measure without administering surveys of the population to find if the services provide are adequate in filling their needs.

Regulatory Variables

As stated in Chapter II, there is no generally agreed upon method for measuring regulatory environments. The variables discussed in this section have been chosen from a number of existing studies on the topic, including variables from the oft-cited Glickfeld and Levine Survey (1992), the Wharton Land Use Control Survey (1990) and Wu and Cho's summary of 29 land use regulations active in the western United States. Each of the variables discussed will be individually assessed to determine the city in which the variable is strongest so that the cities may be ranked in terms of their regulatory environments.

The variables that will be discussed are: comprehensive planning document status, residential growth limits, presence of urban limit lines/greenbelt, building height restrictions, and low income exemptions and incentives, shown in Table 3.21 below.

Table 3.21: Regulatory Variables

Variable	***Indicates***	***Defined***
Comprehensive Planning Document	Status of city planning	The city either does or does not have a comprehensive planning document used to guide development decisions
Residential Growth Limits	Constraints on development	Limits on new housing permits
Urban Limit Lines/Greenbelt	Constraints on development	Limits city growth to within a certain boundary
Building Height Restrictions	Constraints on development	Limits the height of structures
Low Income Exemptions/Incentives	Affordable housing	Policies for the provision of affordable housing

Source: Author

These variables were chosen because they have been recognized in previous studies as significant and are in effect in one or more of the cities studied. Variables that do not differ between the cities studies are neglected for the sole reason that they exist in each community, and therefore are likely to affect the data in similar ways. These variables include: housing infrastructure requirements or adequate public facilities ordinances (adopted by each of the communities in the 1950s), allowable housing densities (each community has individual zoning policies that dictate tolerable densities within a district), and historic preservation requirements (none of the cities studied allows for certain types of development in designated historic areas, and each preserves individual historic sites identified by the city).

General Development Plan

The Planning Institute of California defines a "General Plan" or "General Development Plan" as a comprehensive planning document adopted by a government agency to serve as a foundation for general and development policies. Acting as a tool

for city development, these plans organize and coordinate relationships between urban land uses, chart actual and projected growth and change, express direction and ideals, manage the physical development of the community, and are responsive to change and subject to review.[10] This variable is included in the oft-cited survey conducted by Glickfeld and Levine (1992), and is important to include in this study as well because it is an indicator of regulation as it identifies the aims and ambitions of each community with respect to and *in accordance with the county*. Furthermore, it provides a general impression of the community's perceptions of growth and recognizes growth management tools in place.

In summary of the three communities studied, Berkeley was the first to adopt such a plan in 1955, titled "The Master Plan" which was updated in 1977 to include four specific area plans, an Economic Development Element in 1980 and a Housing Element in 1990.[11] Berkeley now has a new plan, titled "The General Plan," which supersedes the now inactive Master Plan, but does include the four area plans and is mostly consistent with the original. In January 1958 Boulder adopted its first planning document, "Guide for Growth," which included a rudimentary land use plan for the Boulder Valley, but failed to address the delivery of urban services. Thus, with the adoption of the "Boulder Valley Comprehensive Plan" (BVCP) in 1970, Boulder became the second community studied to adopt a General Plan.[12] The BVCP was revised in 1977 to delineate city limits,

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[10] The Planning Institute, "The General Development Plan," http://www.planninginstitute.org/index.php?option=content&task=view&id=220&itemid=172 [accessed March 31, 2010].

[11] City of Berkeley Government Website, "City of Berkeley, California.," http://www.ci.berkeley.ca.us/planning/ [accessed February 2, 2010].

[12] City of Boulder Government Website, "City of Boulder, Colorado," http://ci.boulder.co.us/ [accessed February 2, 2010].

define annexation areas, and designate rural areas. Since 1977, there have been five major updates: 1982, 1990, 1995, 2000 and 2005 with another update planned for 2010. In 1995, Fort Collins was the last of the three communities to adopt a comprehensive general plan, entitled "City Plan."[13] Although it was the last, its adoption was foreshadowed by the creation of a Planning Department in 1974, a Master Street Plan in 1981, and three area plans in the late 1980s.

Table 3.22: Year General Development Plan Instituted

BOULDER	*BERKELEY*	*FORT COLLINS*
1977	1955	1995

Sources: City of Boulder, City of Berkeley, City of Fort Collins

Residential Growth Limits

Residential growth limits dictate the number of new housing units permitted each year. This regulatory variable is very important in this study, as it is a primary method used to restrict growth. Housing caps can place limits based on percentages or may use a definitive number. For example, permits may be allotted so that growth takes place at a certain rate, say 2% per year, or with a number, say 480 units annually.

The City of Boulder underwent rapid transformation from 1960-1970, as the average annual growth rate was approximately 6%, nearly doubling the city's population in one decade. In an effort to combat this growth rate, the citizens of Boulder voted on a growth limitation ordinance named the Danish Plan, named after its principal author Paul Danish, in 1976. Based off a system developed for Petaluma, California, the plan went into effect in April of 1977 by limiting the city's residential growth to 2% per year by

[13] City of Fort Collins Government Website, "City of Fort Collins, Colorado," http://www.fcgov.com/ [accessed February 2, 2010].

allotting approximately 450 new dwelling units annually. Permits were allocated competitively: each project was awarded points based on a number of criteria including design quality, provision of affordable housing, and energy conservation features. The project with the most points was awarded with a permit. The Danish Plan existed in its original form for five-years, until it was revised in 1982. Ordinance 4639 made it so that "residential building permits were issued on a first-come, first-served basis until all the number of permits reached a trigger point, upon which the allocation system switched to a competitive merit system."[14] This system proved to be a legislative nightmare, and was amended soon after.

In 1985, the City Council of Boulder adopted a revised ordinance, which issued permits on a pro-rata system, if the number of permits demanded exceeded supply, then each new development project received a fraction of its request. This system lasted until 1995 when the city revisited its growth management system in response to concerns over affordable housing. The 1995 revisions lowered the growth rate to 1% of the existing housing stock per year and created an allocation method that divided the number of permits available into three allocation pools: one for permanently affordable housing (in which there were the most number of permits to be issued), a second for 'restricted' housing (in which allocations were for housing units deemed initially affordable), and a third allocation pool for developments to be sold at fair market value. This system was not successful because developers simply did not apply for the first two types of permits, therefore the stock of affordable housing did not increase. Finally, in 2000, "a simple pro-rata residential growth managements system would be employed, along with a

[14] J. N. deRaismes, H. L. Hoyt, P. L. Pollack, J. P. Gordon, D. J. Gehr. "Growth Management in Boulder, Colorado: A Case Study," *sponsored by the City of Boulder, CO.*

requirement that all new residential development contribute to affordable housing."[15] This requirement is categorized 'inclusionary zoning.'

Neither Berkeley nor Fort Collins has ever instituted a limit on growth or permits, making the presence of this regulatory variable strongest in Boulder. The following table shows the number of residential building permits issued each year. Unfortunately, data on building permits is not available until 1980.

[15] Ibid

Table 3.23: Residential Permits Issued

	BOULDER	*BERKELEY*	*FORT COLLINS*
1980	122	547	970
1981	44	495	608
1982	96	518	421
1983	9	1201	1327
1984	34	1083	1617
1985	35	669	1486
1986	32	413	901
1987	46	502	879
1988	18	284	774
1989	19	272	572
1980s Average	45.5	598.4	955.5
1990	75	514	728
1991	39	313	760
1992	41	748	850
1993	52	506	1180
1994	47	358	1475
1995	14	163	1246
1996	8	213	1859
1997	220	220	1315
1998	67	383	1681
1999	14	159	1929
1990s Average	57.7	357.7	1302.3
2000	47	123	1581
2001	214	98	1851
2002	293	41	1520
2003	163	286	1384
2004	216	332	1396
2005	184	195	1112
2006	179	141	719
2007	140	74	611
2008	532	406	786
2000s Average	159.8	169.6	1096.0
Overall Average	103.45	388.17	1156.00

Source: HUD: State of the Cities Database

As can be seen in the table above, the number of residential permits in Boulder is, in most cases, lowest, whereas the number of permits issued in Fort Collins is consistently highest (excepting year 1982). For the sake of summary, average number of permits issued annually has been computed. The average residential housing permits allocated in

Berkeley and in Fort Collins is nearly four times and eleven times greater, respectively, than Boulder's average. This data can be computed for type of structure built; on average, the number of permits issued in Boulder for multi-family structures account for 54.6% of total permits issued. This number is compared to Berkeley's average of 52.3% and of Fort Collins' average of 33%.

Urban Limit Line/Greenbelt

Urban limit lines are boundaries that surround a city, outside of which no development may take place. Greenbelts are similar to urban limit lines; however provide an area of public open space surrounding a city in which no development or improvements to the land may take place. This variable has been the subject of many studies and is very significant to measure and identify in this analysis as well, since urban limit lines/greenbelts effectively contain and restrict development to a certain area.

Called the "Blue Line," Boulder adopted its first urban service boundary in 1959 when the electorate voted to limit the extension of water service above a certain elevation in order to protect the foothills from development, effectively creating and defining the western border of city limits. Soon thereafter, "the City adopted a simple eastern service area boundary based on its ability to perpetuate a gravity flow sewer system."[16] South Boulder, Bear, Green, and Flagstaff Mountains were already protected from development under the Mountain Parks Program, founded in 1898. These established no-growth areas provided the inspiration for the subsequent first purchase of the Open Space Program in 1962. Five years later, in 1967, the citizens of Boulder authorized the City government to begin acquiring "the remaining backdrop land as well as the open land on the plains with

[16] J. N. deRaismes, H. L. Hoyt, P. L. Pollack, J. P. Gordon, D. J. Gehr. "Growth Management in Boulder, Colorado: A Case Study," *sponsored by the City of Boulder, CO.*

remaining scenic or 'open space' value, by passing the four percent Open Space tax."[17] Boulder became the first city in the United States to have a locally funded Open Space program, which was officially created in 1973 under Ordinance Number 3970. Open Space was first acquired from outer areas, to combat competing urbanizing areas, and then built the program inward towards the City. The City of Boulder has continued to purchase Open Space lands, spending upwards of $128 million to date, and effectively protecting an approximate total of 37,000 acres of an entire planning area of 60,000 acres.

Although Berkeley has no official urban limit line, it should be recognized that the San Francisco Bay defines the western border of its city limits. Clearly, this is a boundary that restricts development. Furthermore, Berkeley's city limits have changed very little since 1960 (See Table 3.3) due to its location within a greater metropolitan area surrounded by neighboring cities. Even with this in mind, and coupled by the fact that Fort Collins has not instituted a limit line or greenbelt, Boulder's regulatory policies are deemed to be the strictest for this variable.

Building Height Restrictions

Building height restrictions on developed and developing property are regulatory variables that dictate the physical shape and size of the city in which they are in place. In 1971, Boulder established a building height limitation of 55 feet to preserve the view of the Rocky Mountains. This limit is imposed citywide, ensuring that each resident and visitor have a view of the Flatirons to the West of the city. Berkeley instituted a maximum height limit as early as 1949 in its Zoning Ordinance of the City of Berkeley,

[17] Ibid

adopted Ordinance 3081.[18] This ordinance designated limits of 3-8 stories in its residential and commercial districts and sets a general limit at 75 feet, but provides exceptions for buildings designated for public or semi-public uses to exceed zoning limitations. The City of Fort Collins issued a maximum building height of 40 feet above grade in 1980, subject to zoning restrictions, which may allow for greater heights. Prior to 1980, maximum limits were established within zones. Because both the City of Fort Collins and the City of Berkeley limit building heights through zoning policies that affect certain areas of the city, but not the entire city, Boulder's policies are determined to be the strictest. Furthermore, Berkeley adopts a general limit of 75 feet (allowing for exceptions), whereas Boulder limits height to 55 feet, city wide, regardless of use.

Low Income Exemptions and Incentives

The provision of affordable housing is an important regulatory variable to include in this analysis because it demonstrates city action taken to provide for its low-income residents. Providing affordable housing can happen in a variety of ways. Policies discussed here include inclusionary zoning, density bonuses, and rent stabilization. Inclusionary zoning requires a certain amount of new development or existing stock to be allocated as affordable housing for low and moderate income households. Density bonuses are given to developers that create high density housing, which is primarily consumed by lower income residents. Rent stabilization is a process by which the city keeps rents at artificially low prices, normally through subsidies.

Boulder adopted an inclusionary zoning ordinance (ordinance number 7476) in

[18] City of Berkeley Government Website, "City of Berkeley, California.," http://www.ci.berkeley.ca.us/planning/ [accessed February 2, 2010].

2000 and has amended its program twice, once in 2003 and again in 2007.[19] Its current program requires 20% of new housing to be set aside for low income households in both for-sale and rental developments. Thus far, Boulder has produced 150 affordable units.[20] Boulder does not have a density bonus program in place, although has considered enacting a plan on multiple occasions. One of the primary reasons it does not have such a program in place is because higher density development is more difficult in Boulder due to its building height restrictions. Boulder does not have a rent stabilization program.

In 1980 Berkeley adopted a policy of rent stabilization to protect affordable housing. Eleven years later, the rent stabilization ordinance regulated 19,000 of the 24,500 rental units in the city. About 3100 more are provided subsidies or coops, others are student housing and dormitories which are exempt. There are an unknown number of units, which should be but are not registered. In 1990, Berkeley updated its Housing Element, with Goal 1 being affordable housing. In 1991 the rent stabilization board approved a series of regulations allowing major rent increases. In 1992, City council permanently banned the conversion of properties with four or more units, enacted a housing impact fee to ensure that non residential development also increases housing supply, and adopted an inclusionary zoning ordinance to further provide affordable housing.

Advantages and Disadvantages of Data Sources

As with most data sets, there are advantages and disadvantages associated with

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[19] *Boulder Revised Code,* Title 9: Land Use Regulation, 9-6-13 "Inclusionary Zoning" (2007). http://www.colocode.com/boulder2/chapter9-13.htm [accessed March 26, 2010].

[20] Nicholas Brunick, "The Impact of Inclusionary Zoning on Development," *sponsored by Business and Professional People for the Public Interest,* http://www.bpichicago.org/documents/impact_iz_development.pdf [accessed March 31, 2010].

using decennial Census data for that must be mentioned. Using a single source for the empirical data is useful in that most of the variables are measured using the same procedures and definitions each year. Moreover, Census data is particularly reliable and representative of the entire population as it reports individual numbers for each state, county, standard metropolitan area, place, etc. Unlike many other databases (American Housing Survey[21], Construction Industry Research Board Data[22]), the decennial Census allows for this close examination by defining its' areas into small parts.

Decennial data is problematic because there is much time between reports. This lag time may affect results as national social, economic, and demographic trends have time to appear in the data, and thus are very likely to affect the numbers. While also mentioned as an advantage, it is important to note that some measurement differences do exist between the years. However, most measurement discrepancies can be accounted for and corrected so that the data can be compared across time periods.

Data on the regulatory environment has a number of advantages and disadvantages to address as well. Data for each of the three cities was collected principally through each city's website. Each city's government page contained a link to the city's clerk's office, which is responsible for documenting agenda minutes, resolutions, and ordinances, among other items. For the purpose of this analysis, data was collected using ordinances only because ordinances, unlike resolutions, provide specific policies to accomplish the specific goal. Resolutions and other declarations of

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[21] American Housing Survey, sponsored by the Department of Housing and Urban Development in association with the US Census Bureau, http://www.census.gov/hhes/www/housing/ahs/ahs.html [accessed March 31, 2010].

[22] Construction Industry Research Board, http://www.cirbdata.com/reports/index.html [accessed March 31, 2010].

intent simply state an overarching aim, but provide no policy guidelines for implementation, making measurement nearly impossible. The city websites were reliable and often included links to the actual ordinance passed. In addition, the city government websites provided reports issued for council members detailing housing, population, and regulatory trends and conditions.

Using city specific government websites also had its disadvantages. Ordinances are not listed by number, date, or subject, so that searches for a specific policy returned any number of results that had to be sorted through. For instance, the phrase "building height" was entered into the search box, and returned a multitude of matches, many of them irrelevant. Because there is no real methodology for searching these websites in pursuit of a certain variable, there is room for human error. As commonly remarked upon by scholars of urban growth management, there is no generally accepted way to measure or classify regulatory variables, and information on the extent of regulation itself is difficult to find.

Conclusion

This chapter provided the data and summary statistics that will be used in the following chapter to answer and analyze the three hypotheses. Beginning with supply side variables, it discussed a variety of density statistics, values for owner and renter occupied properties, and the year the structure was built. Demand side variables examined include income, average travel time to work, and public service indicators. Regulatory data focused on the status of a comprehensive planning document, residential growth limitations, urban limit line/greenbelts, building height limitations, and the provision of affordable housing. Each of the regulatory variables summarized concluded

with an assessment of the regulatory environment in the city in terms of the particular variable examined. Recall that Berkeley led the other two cities in adopting a general plan, Boulder placed the most (only) limits on annual residential growth and number of permits issued, Boulder was the only city to impose a greenbelt, Boulder's building height limitations were the strictest, and Boulder and Berkeley both have exemptions and incentives to create affordable housing to provide for its low income populations. In sum, Boulder has the strongest regulatory environment of the three cities studied, followed by Berkeley and then by Fort Collins. This rank of the cities provides a launching point for the analysis presented in Chapter IV.

CHAPTER IV

ANALYSIS

This chapter provides the analysis of the data presented in Chapter III using the theoretical framework laid out in Chapter II. It is divided into three sections, each addressing one of the hypotheses made at the end of Chapter I. The first section examines the first hypothesis: that housing prices will be higher in Boulder and Berkeley than in Fort Collins due to regulatory policies. The second section addresses the second hypothesis: that average travel time to work will be greater in Boulder and Berkeley than in Fort Collins. The third section discusses the third hypothesis: that the quality of publicly used resources is highest in Boulder and Berkeley. This chapter examines each of the hypotheses in terms of the regulatory environment of each community.

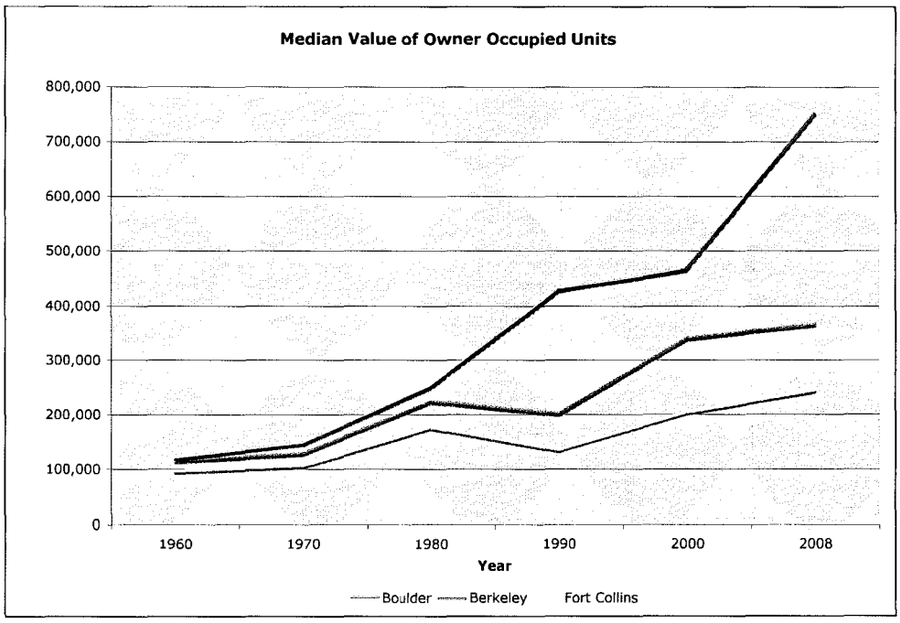
Hypothesis 1: Housing Prices

The first hypothesis of this study is: housing prices will increase with policies intended to restrict urban growth. The regulatory variables studied include: the status of a comprehensive planning document, limits on residential growth, the presence of urban growth boundaries, restrictions on building heights, and incentives for the provision of low income housing. These regulatory policies are assumed to restrict the supply of housing—and if demand remains constant (or increases), then costs will rise. As identified at the end of the Chapter III, the City of Boulder is determined to have the most

restrictive growth policy, followed by the City of Berkeley and then by the City of Fort Collins—so it was expected that Boulder's housing costs would be greatest.

Graph 4.1 below, demonstrating the price of housing is the median value for owner occupied homes.

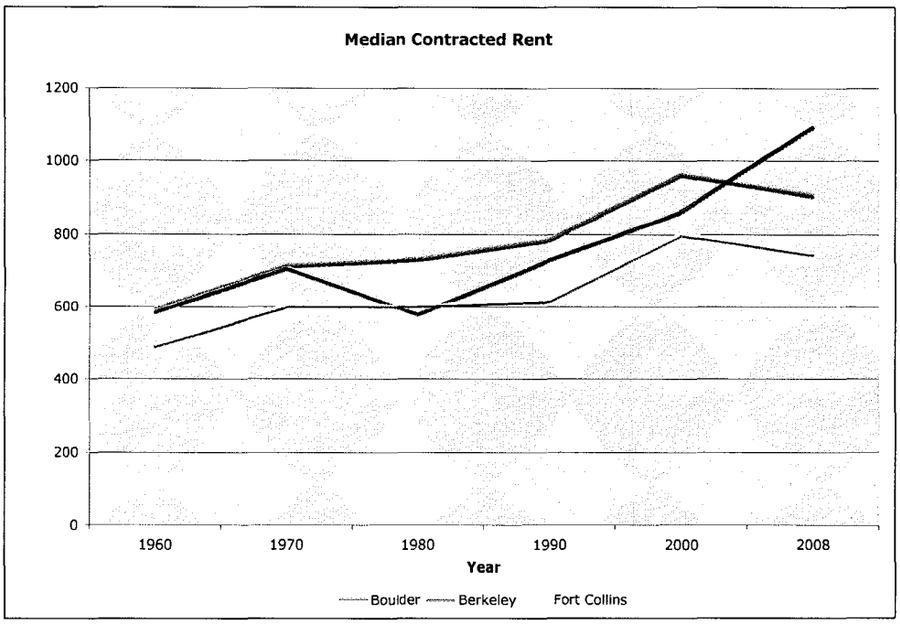
Graph 4.1: Median Values of Owner Occupied Units



Source: US Census Data

All three cities have positive trends, starting at nearly the same value in 1960, and then disperse: 2008 home values are nearly three times higher in Berkeley as they are in Fort Collins. Graph 4.2 below shows the median contracted rent, and it is possible to see that the two Colorado communities follow the same pattern of price increases and decreases. Berkeley follows this pattern somewhat—the decrease in contracted rent in 1980 is possibly due to the rent stabilization program that started in Berkeley that same year.

Graph 4.2: Median Contracted Rent



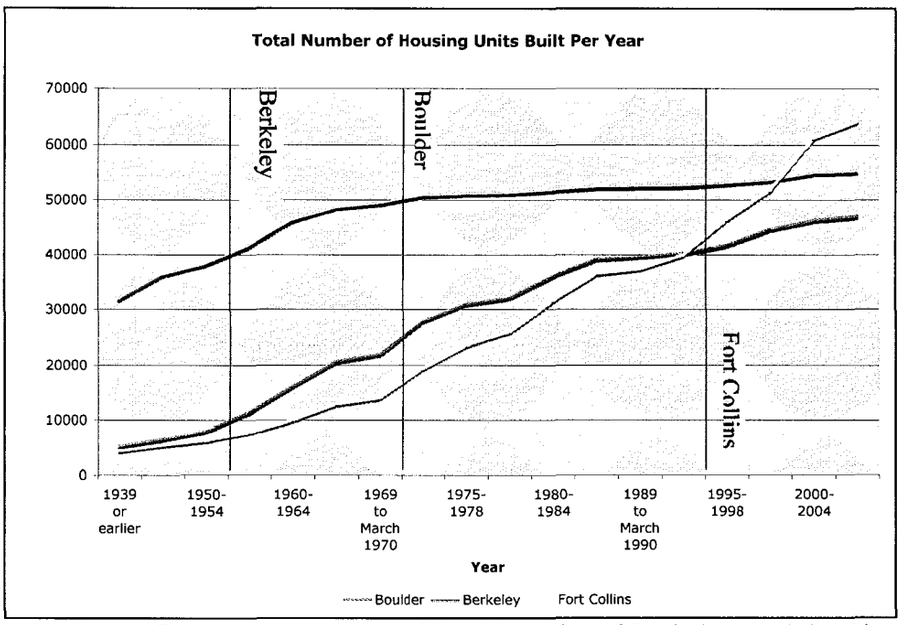
Source: US Census Bureau

Berkeley consistently (1960-2008) has the highest median value of owner-occupied units. On average, median values in Berkeley are $361,695 compared to $229,908 in Boulder. The City of Boulder ($785) has barely higher average rents than Berkeley ($763). Fort Collins consistently ranks last in home and rent values. These patterns can be attributed to a number of reasons.

First, Berkeley is set apart from both Fort Collins and Boulder in that the majority (57.3%) of Berkeley's buildings were constructed in or earlier than 1939. This is compared to just 11.4% and 7.0% in Boulder and Fort Collins, respectively. Graph 4.2 demonstrates the total supply of housing units and the percentage of total units built each year to show general development trends for each city. It is easy to see that the majority of Berkeley's development happened before 1970, and that Boulder and Fort Collins grew at about the same pace until Fort Collins took off around 1997. Berkeley was

established as a city much earlier than the Colorado communities, allowing additional time for housing units to accrue value. Berkeley's development path plateaus around year 1975, indicating proportionately small amounts of additional units constructed between 1975 and 2008. This limited supply of new housing developments may also contribute to Berkeley's higher cost of housing.

Graph 4.3: Year Structure Built as a Percentage of Total Structures and Year General Development Plan Adopted



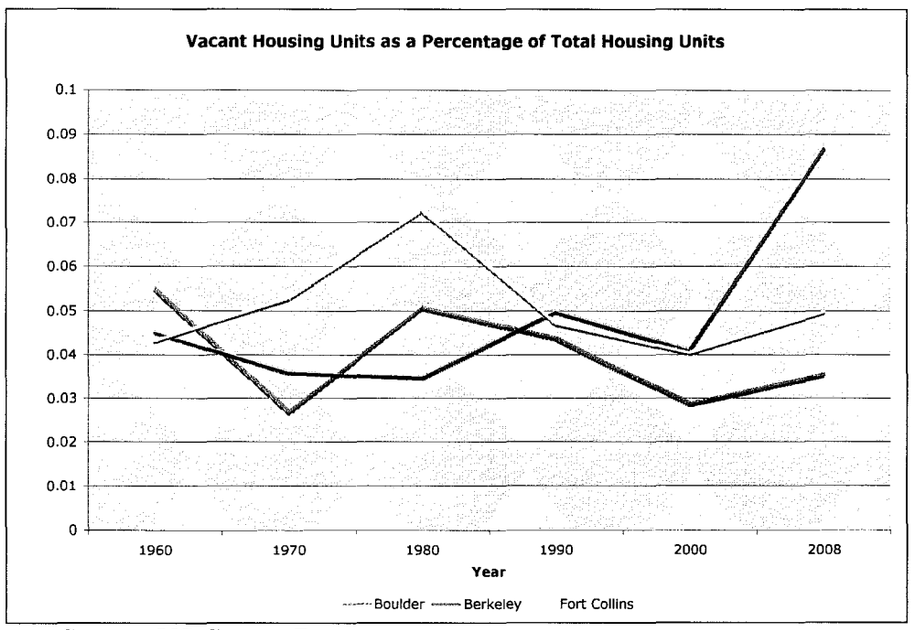
Source: US Census Bureau and the City of Boulder, City of Berkeley, and the City of Fort Collins.

The three vertical green lines on the graph indicate the year each city adopted its comprehensive planning document. It is possible to see an increase in construction in each city after the adoption of a general development plan; that is to say that it appears that Berkeley's rate of home construction after 1955 accelerated for a short amount of time, as did the construction in Boulder and Fort Collins after the general development

plans were enacted. Accelerated or continued growth may indicate that adoption of a comprehensive plan spurs development. This is interesting because each planning document includes general growth estimations and policies for dealing with growth—it just may happen that each city adopted its plan at the point in time when it anticipated high rates of growth.

That Boulder's home values are not the highest is interesting. First, Boulder has a lower average vacancy rate than Berkeley, indicating strong demand for housing. Theoretically, if a housing market is competitive, there will be less vacancies whereas if a housing market is relatively open, there will be more vacancies.

Graph 4.4: Vacant Housing Units as a Percentage of Total Housing Units



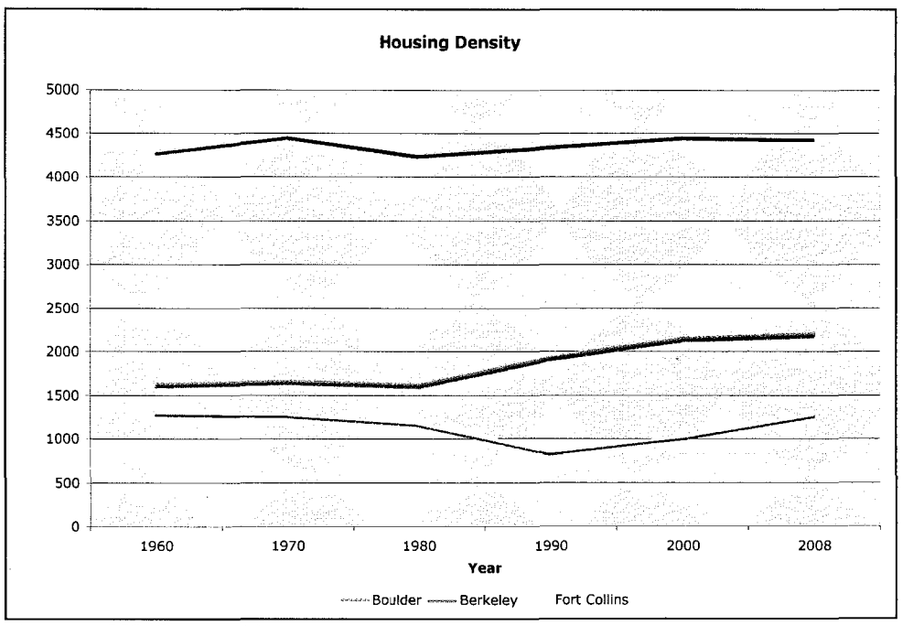
Source: US Census Bureau

While no pattern can be observed in Graph 4.3, it is interesting to note that number of vacant housing units in Berkeley skyrocketed in 2008, coinciding with a major increase in property values. This may be due to homeowners succumbing to the pressures of

increased property values are looking sell to capitalize on their investment.

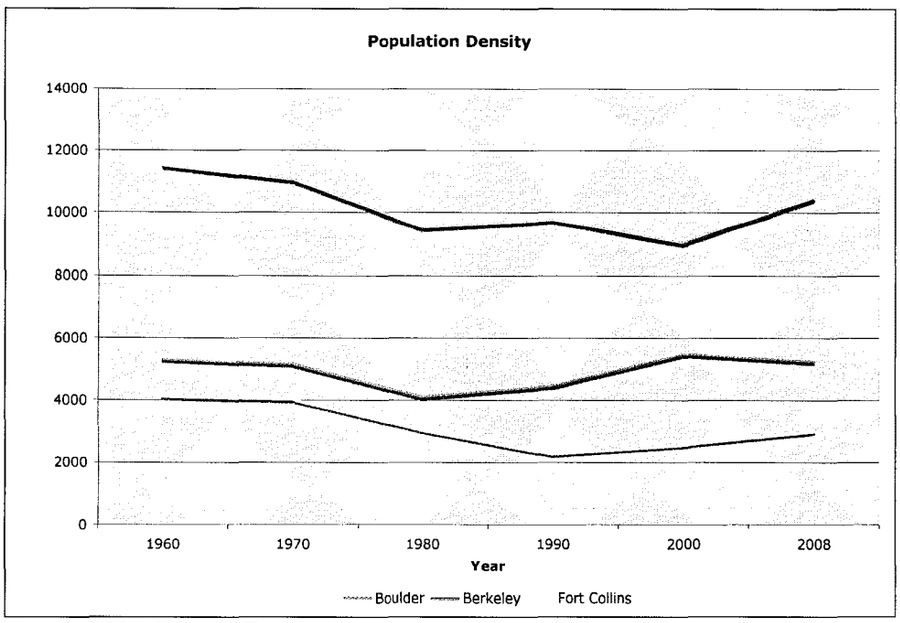
Secondly, Boulder has much lower population and housing densities than Berkeley; housing units in low-density areas typically have higher property values because they are less crowded and therefore more desirable. It was theorized in Chapter II that densities increase with regulation. This is a result of the limited number of housing and land available at the urban fringe, causing households to move back to the city, promoting infill and development. Graphs 4.3 and 4.4 show housing and population density, respectively.

Graph 4.5: Housing Density



Source: US Census Bureau

Graph 4.6: Population Density



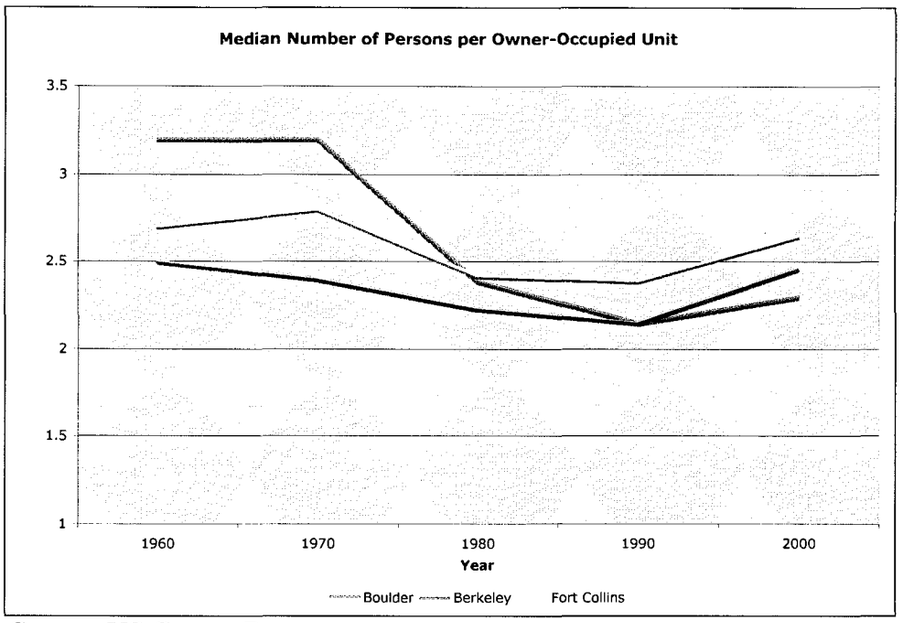
Source: US Census Bureau

It's interesting to see that the population and housing density trends are generally the same; that is that Boulder's population density trend matches the trend for housing density, as does Fort Collins. The City of Berkeley experienced a decline in its population between 1970 and 2000, possibly prompting the mismatch between its housing and population density trends.

Another indicator of densities is the median number of people per occupied unit. This variable is shown in Graph 4.5 below. It is possible to observe a *general* trend for all three cities; that is that median persons per unit decreases each year until 2000, when there is a general increase. The shape of Graph 4.5 looks almost like an inverted bell curve. As part of its 1990 Downtown Plan, the City of Berkeley instituted a density bonus in 1990, represented by the vertical line in the graph, encouraging higher density development in certain areas, and it is possible that the change in median persons per

occupied unit is due in part to this policy.

Graph 4.7: Median Number of Persons per Owner-Occupied Unit



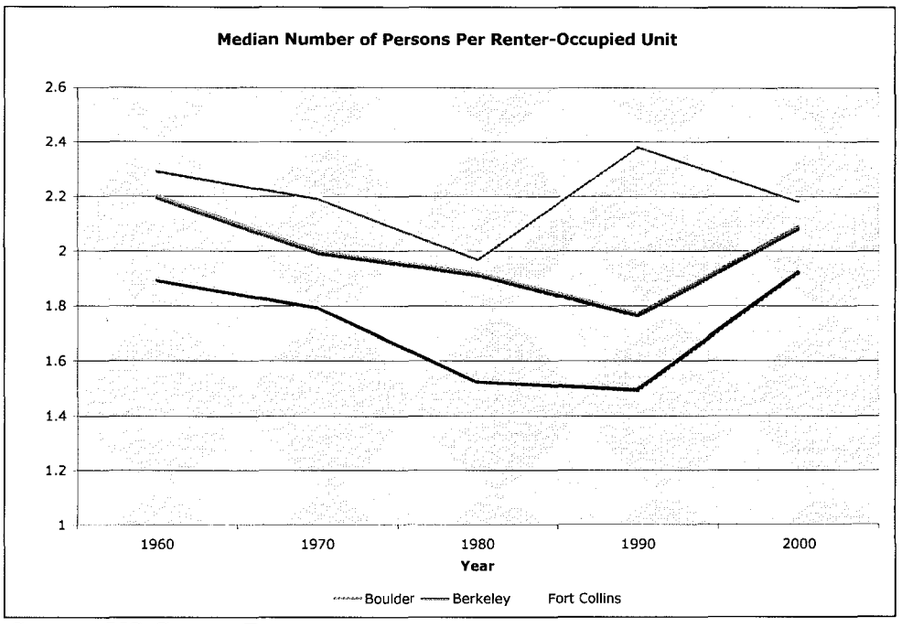
Source: US Census Bureau

These measures of density contribute to the price and cost of housing. As stated in Chapter II, the price and cost of housing is determined by a number of push and pull factors. Increasing densities typically make housing less attractive, possibly causing residents to move in search of lower density housing options. However, these densities are so similar (most extreme difference between cities ranges from 2.5 to 3.2 persons per unit in 1960), and move in the exact same directions (only exception is the slight increase in 1970 in Fort Collins) that it is likely that housing densities follow a national trend. Also, with ten years in between each of the data points, there is enough time for residents to get accustomed to small changes in unit density—a tenth of a person increase over a ten year period doesn't cause a house to feel overly crowded.

The following graph details median persons per renter-occupied unit. It is

possible to see that the renter-occupied distribution and pattern is nearly the same as that for owner-occupied units: generally decreasing until 2000, when there is an increase.

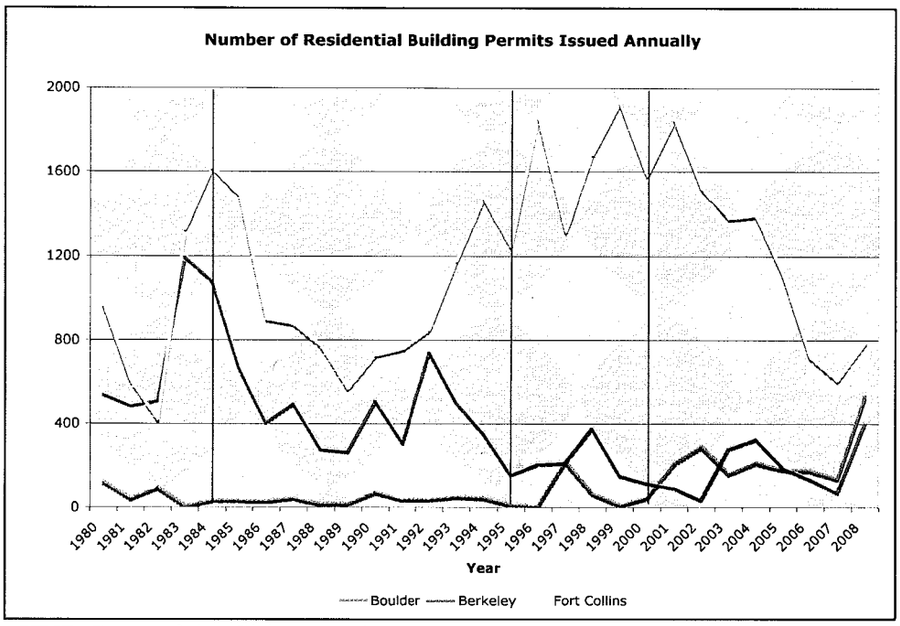
Graph 4.8: Median Number of Persons Per Renter-Occupied Unit



Source: US Census Bureau

Third, the City of Boulder has a number of growth restrictions in place that limit the supply of available housing and the construction of new housing. These policies include the presence of an urban growth boundary, limitations on annual growth and number of permits issued annually, and a citywide limit on building heights. The number of permits issued annually is shown in Graph 4.9.

Graph 4.9: Number of Residential Building Permits Issued Annually



Source: HUD State of the Cities Database

Above Graph 4.9 shows the number of residential permits issued annually. There are three vertical green lines placed in the graph to illustrate some key dates from Boulder's residential growth management system, showing changes in permit policy. The first vertical line is placed at year 1985 when the 'trigger system' was abandoned for a pro-rata system under which all applicants received at least a portion of land requested. There is no discernible effect shown in the graph. The second line is placed at year 1995, when the growth rate was reduced to 1% of the total housing stock. Again, there is no discernible effect in the graph. The third and last line in this graph is placed at year 2000, when the last revision to the Danish Plan was made, this time including an inclusionary zoning ordinance. There is an upward trend following year 2000, however, is generally downward after 2003. Whether this is due to the revision of Boulder's growth management system is difficult to say. Boulder's limit on annual permits issued, its

growth boundary, and building height restrictions should cause housing prices to increase. Boulder and Berkeley both have provisions that contribute to the amount of affordable housing.

Berkeley and Fort Collins do not have policies that serve to limit the number of permits issued annually, and therefore don't have lines representing policy changes in the graph. However, it is very possible to see that Fort Collins issues the most residential building permits, on par with (and possibly fueling) its faster pace of population growth; average population growth rate in Fort Collins over a ten-year period is 42.46%. Boulder and Berkeley average at 23.91% and 0.15%, respectively.

These results indicate that although regulation is a contributing factor to housing prices, they are not the overriding factor. This is in agreement with Nelson's et al. (2002) equation used to determine housing prices, which includes five factors, as described in Chapter II.[1] Considering their equation, it could be said that Berkeley has the highest infrastructure, present, and future location values due to its spot within a major metropolitan area. It has low agricultural value because large lots are not available. It could be argued that Boulder has the highest structural values due to its urban growth restrictions that cause housing construction to be more expensive. It may be that Fort Collins has the highest agricultural value because large lots are available and its location further from major cities make farming a more attractive option. Using this pricing equation, it can be concluded that infrastructure, present, and future location values do more to influence prices than does growth regulation.

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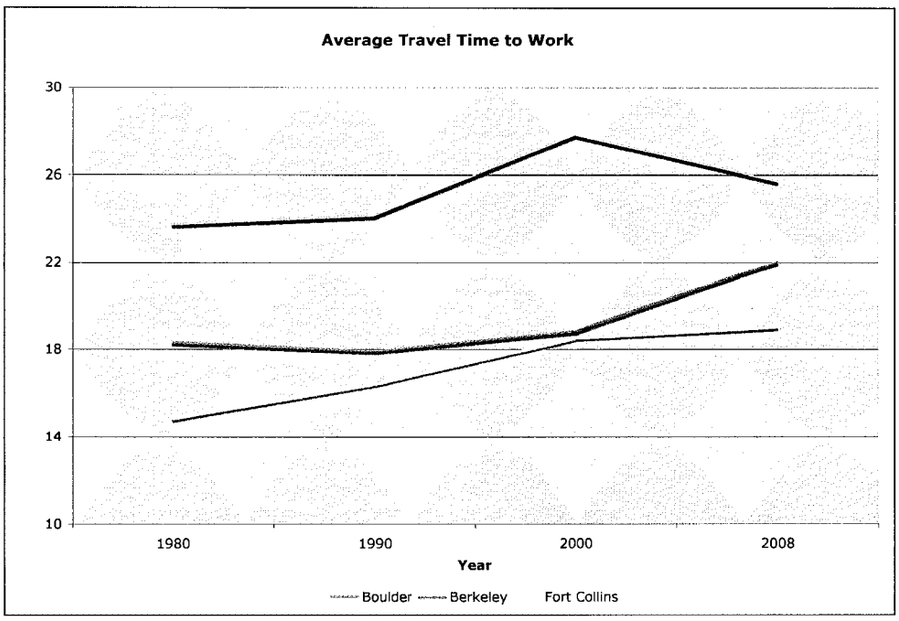
[1] Arthur C. Nelson, Rolf Pendall, Casey J. Dawkins, and Gerrit J. Knapp, "The Link Between Growth Management and Housing Affordability: The Academic Evidence" [paper prepared for The Brookings Institution on Urban and Metropolitan Policy, Washington D.C., February 2002].

Hypothesis 2: Place of Residency and Place of Employment

The second purpose of this study was to address the hypothesis that employees working in Fort Collins will be more apt to live in Fort Collins than those of Boulder or Berkeley. As mentioned in Chapter IV, the lack of data on this subject makes a conclusion impossible: there is no consistent measure or record that details a relationship between place of residency and place of employment. The best data available is average commute times, which reveals nothing about the ability or inability of citizens to live and work in the same community. Nonetheless, these are shown in the graph below.

Graph 4.10: Average Travel Time to Work



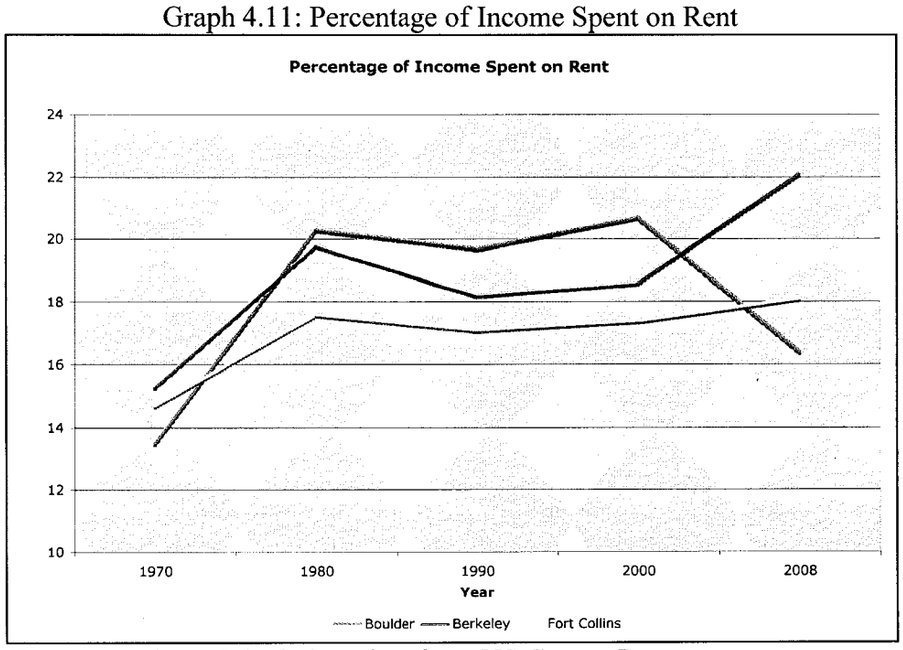
Source: US Census Bureau

It was hypothesized that employees of Fort Collins are more likely to live in the same city as their place of work. Average commute times vary as much as eight minutes between the cities. Fort Collins consistently has the lowest times to commute, which may mean that employees are in fact living closer to their homes. A major problem with this data is

that it is inconclusive—it does not offer details on the mode of transportation or the effects of traffic congestion. Berkeley's commute times are consistently highest, possibly suggesting that citizens of Berkeley must drive farther distances to get to their place of work. It may also be that Berkeley, as the only city within a major metropolitan area, has higher traffic congestion. In sum, there is no definitive evidence signaling to the inability of employees to live in the same city as they are employed.

A statistic that does provide some insight into this relationship is the percentage of income spent on rent. This statistic demonstrates the relative price of housing in each of the three cities, and is displayed in Graph 4.11

Graph 4.11: Percentage of Income Spent on Rent



Source: Authors Calculation, data from US Census Bureau

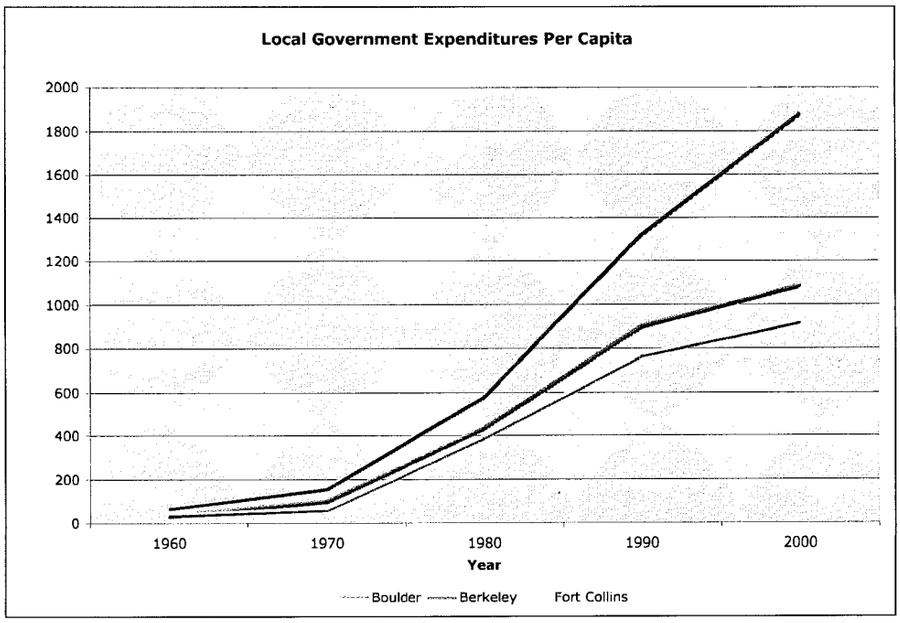
On average, citizens of Boulder, Berkeley, and Fort Collins spend 18.12, 18.8, and 16.98 percent, respectively, of their incomes on rent. The citizens of Berkeley spend the highest proportion of income on the cost of housing, closely followed by Boulder and

then by Fort Collins. None of these percentages are so high that residents would necessarily be pushed out: HUD sets a recommended rent to income threshold at 30%.[89] These statements are generalizations, and should be recognized as such. In sum, there are no conclusive results to the second hypothesis.

Hypothesis 3: Quality of Publicly Used Resources

The third hypothesis to be examined is the quality of publicly used resources, specifically those detailing the extent of crime and the size of the police force. These are expected to be higher in communities with urban growth regulations than in those without. Local government expenditures per capita begin to illustrate the quality of public services provided. The City of Berkeley consistently spends the most on its citizens, spending more than double that of Fort Collins in 2008, shown below in Graph 4.12.

Graph 4.12: Local Government Expenditures Per Capita



Source: City and County Data Books

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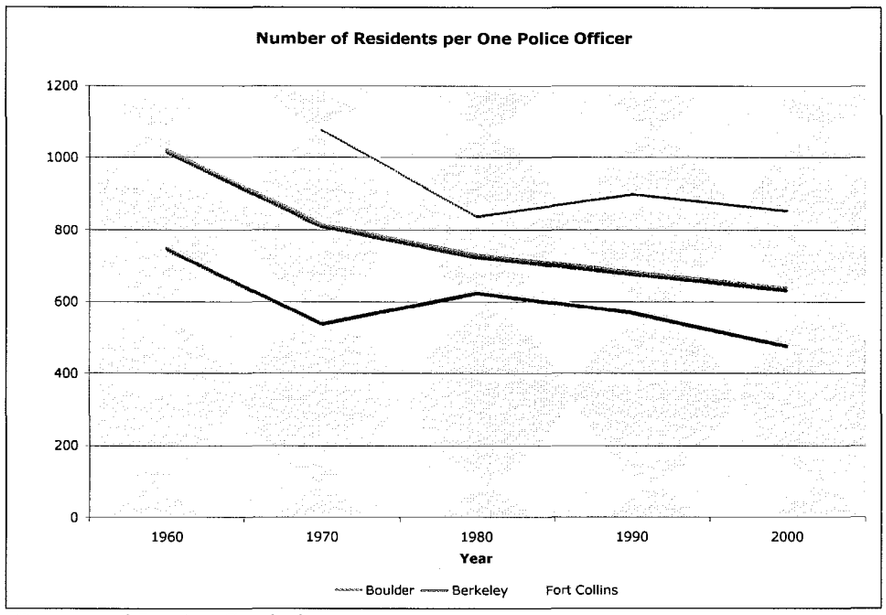
Monetary expenditures alone do not determine the quality of services provided. Cross-comparisons of expenditures between cities and states are dangerous to make because they offer no detail as to *how* the money is spent; the difficulty of assessing implementation arises again, as do questions concerning efficiency.

Spending on sewers/sanitation per capita and as a percentage of total expenditures reveal no pattern—each city allocates a different percent of the budget to sewers/sanitation each year, and per capita spending varies similarly (See Tables 3.19 and 3.20). The same results were found in examining spending on highways per capita and as a percentage of total expenditures. Decennial data is particularly problematic in the analysis of these variables because it may be that cities allot different amounts to services each year depending on what the service schedule is. For instance, "City A" may need to overhaul its sanitation system one year, requiring a larger proportion of the budget and consequently higher per capita spending, while ten years later, the system is still in working order, and spending is average. Moreover, these variables do not represent quality.

Crime data and spending on police are the last measures of the quality of public service delivery. The following Graph 4.13 shows the number of residents per one police officer. It is possible to observe a general negative trend, meaning that there are increasingly more police officers per citizen.

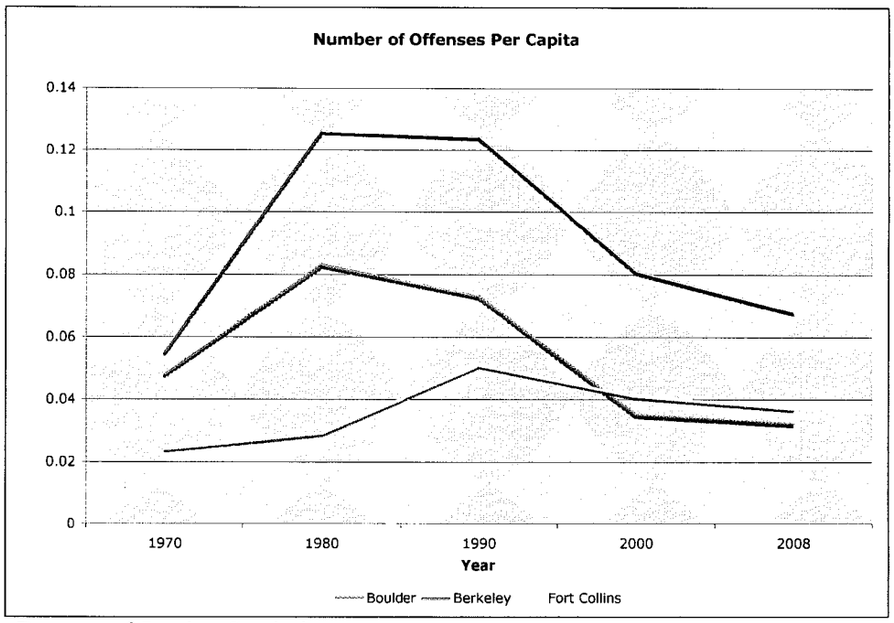
Graph 4.13: Number of Residents Per Police Officer



Source: Bureau of Justice Statistics

In examining the number of residents per police officer, Berkeley has the greatest proportion of police force to citizens. While this is indicative of quality, it is certainly not the only measure. The number offenses known to the police indicate crime rate and are illustrated in Graph 4.14.

Graph 4.14: Number of Offenses Known to Police, Per Capita



Source: Bureau of Justice Statistics

Crime reports show that Berkeley also has the highest amount of offenses known to police, and so Berkeley probably requires the greater proportion to keep the city comparatively safe. None of these variables are particularly explanatory of the quality of the public services provided, although spending is indicative of quality. A conclusion on the effects of urban growth regulation on the quality of public services is not possible.

Examining both the number of offenses per capita and the number of residents per police officer together reveals that Berkeley requires a greater proportion of police to resident because Berkeley has a greater rate of crime per capita. Similarly, Boulder and Fort Collins need less police for their lesser crime rates. Since all three of the communities have a police force relative to the size of their crime rates, it can be assumed that the quality of the service provided is more or less the same. In sum, Boulder and Berkeley do not provide any higher quality of resources than Fort Collins.

Summary:

The first hypothesis on higher cost of living expenses in cities with increased growth restrictions was found to be partly true: home values in Berkeley exceeded those of Boulder, in spite of Boulder's higher regulatory environment. Median contracted rents in Boulder are higher than those of both Berkeley. Fort Collins consistently has the lowest home values and contracted rents. The second hypothesis on the relationship between place of residence and place of employment was impossible to fully evaluate because data is unavailable. In its stead, commute times and average proportion of income spent on rent were examined to find that the residents of Berkeley spent the most time commuting and the highest proportion of their income on rent. The third hypothesis on the quality of public services was also found to have inconclusive results. The City of Berkeley has the highest expenditures per capita. This is indicative of quality, but excludes issues of implementation and necessity. Data on public service spending on sewers/sanitation and highways reveal no pattern and is difficult to evaluate since it is decennial. Police and crime data show that Berkeley has the highest proportion of police officers to residents, but also has the highest crime rate. No conclusions on quality have been made.

CHAPTER V

CONCLUSIONS

The final chapter of this thesis discusses implications and makes policy recommendations. It examines issues encountered during the process of writing this thesis and proposes methods for corrections. The final section of this paper suggests avenues for further research.

Implications and Policy Recommendations

This thesis made cross-comparisons between cities and states and approaches to growth management, and in doing so revealed the uniqueness of each city, state, and policy. While this type of comparison allows for a general conclusion about the overall effects of growth management, it is exceedingly difficult and probably ill-advised to make general policy recommendations for each city.

Boulder is a city with many restrictions on growth—featuring a concrete urban growth boundary, annual housing caps, and a commitment to preserving open space. Available land for development in Boulder has been snatched up by developers leaving little additional space for new construction. Housing prices, while still below Berkeley, are well above the national and Colorado average. If the City of Boulder wishes to further increase property values, they should continue their current policies geared towards restricting growth. However, if the City of Boulder wishes to make housing

more affordable, it will have to increase allowable densities. A density bonus would create incentives for developers to make higher density housing such as multi-family structures. Boulder's maximum building height at 55 feet makes building vertically to increase densities impossible. It is not recommended that the city changes this restriction because it preserves the mountain backdrop, and a number of tall buildings would affect this view and similarly change the character of the city. Another option to increase densities is to allow for smaller lot sizes. The City of Boulder has a charm that sets it apart from other Colorado cities simply because it is densely populated, has easy access to open space parks, and has an absence of tall buildings giving it the feeling of a small community. Changes in its growth management program might affect these characteristics that make Boulder such a desirable place to live, and so proposed policies need to be thoroughly examined to ensure that they are in tune with both its long range development plan and the characteristics that set it apart.

The City of Berkeley has its own set of traits that make it unique, not last is its dedication to affordable housing and infill development. In the past, Berkeley has instituted policies to keep housing prices down, including a rent stabilization ordinance that lasted for over twelve years. Although the overriding goal of such policies is to ensure that housing remains affordable, by not taking into account market prices, they actually contribute to massive price increases once the ordinance is up. Also, throughout the duration of the ordinance, there were many units that never participated (which is illegal), creating a black market for housing. If Berkeley wants to increase its proportion of affordable units, adoption of a density bonus is recommended. Berkeley limits building heights, but not to such an extent as Boulder, so the city should create incentives

for vertical development. Since Berkeley is in the middle of a large metropolitan area, the city should be careful to avoid pockets of property devaluation—and should combat these areas with infill investments, particularly investments in multi-family housing structures and housing units catering to low income residents. The City of Berkeley has development plans for each of its neighborhoods to ensure that growth takes the desired form specific to the area. These should be consulted and revised to guarantee that developments support the community goals.

The City of Fort Collins has a growth rate that outpaces both Boulder and Berkeley. It is at a very prime time to enact policies that manage its growth and direct it to desired areas. Since Fort Collins is relatively new to the growth management arena, it should look to other cities for guidance, learning from the past successes and mistakes of others. The city area of Fort Collins is also expanding rapidly, and as such, it is recommended that Fort Collins contain its growth by adopting an urban growth boundary that expires over time; modeled after Portland's own boundary, which takes present and predicted growth into account. A boundary in Fort Collins would also prompt infill and higher densities, combating the flight to the suburbs. A boundary would increase property values, but a density bonus contradicts this, theoretically leaving property values unchanged. Fort Collins adopted its general development plan in 1995, and it should keep this document up to date and relevant through constant revisions.

Issues

The first major problem discovered in the process of writing this thesis is the choice of cities studied. Boulder and Fort Collins offer good comparisons because they are both Colorado cities, and therefore are subject to the same regional economic and

social trends. Both cities have similar starting points in 1960: comparable land areas, minimal development prior to 1939, close population totals, similar geographic characteristics. Even in 1960, Berkeley stands out: the majority of its development had already happened, the city is bordered by the ocean and neighboring communities leaving very little room for expansion, and a total population three times the size of Boulder and four times that of Fort Collins. There are few qualities shared with all three cities: they are home to major universities and large student populations, have similar starting values of owner occupied homes and contracted rents, and have different policies limiting growth, allowing a continuum to be made.

The second issue with this thesis is its approach to answering the hypotheses. Although the methodology is unique, a study of land use regulations and their effects on the community would be better served by interviews and surveys of people actually living within the city and familiar with the restrictions. Measures of the *quality* of community life should not be described using monetary statistics. Policy data, especially historical, would be better explained by an official than by searching for ordinances or policies online. Interviews and surveys could provide insight into the issues of implementation and efficiency, whereas paper documents are unable to convey the process or overall successes and failures of policies. A benefit to the approach taken in this study is that it leaves no room for personal opinions or biases, although human error is a possibility.

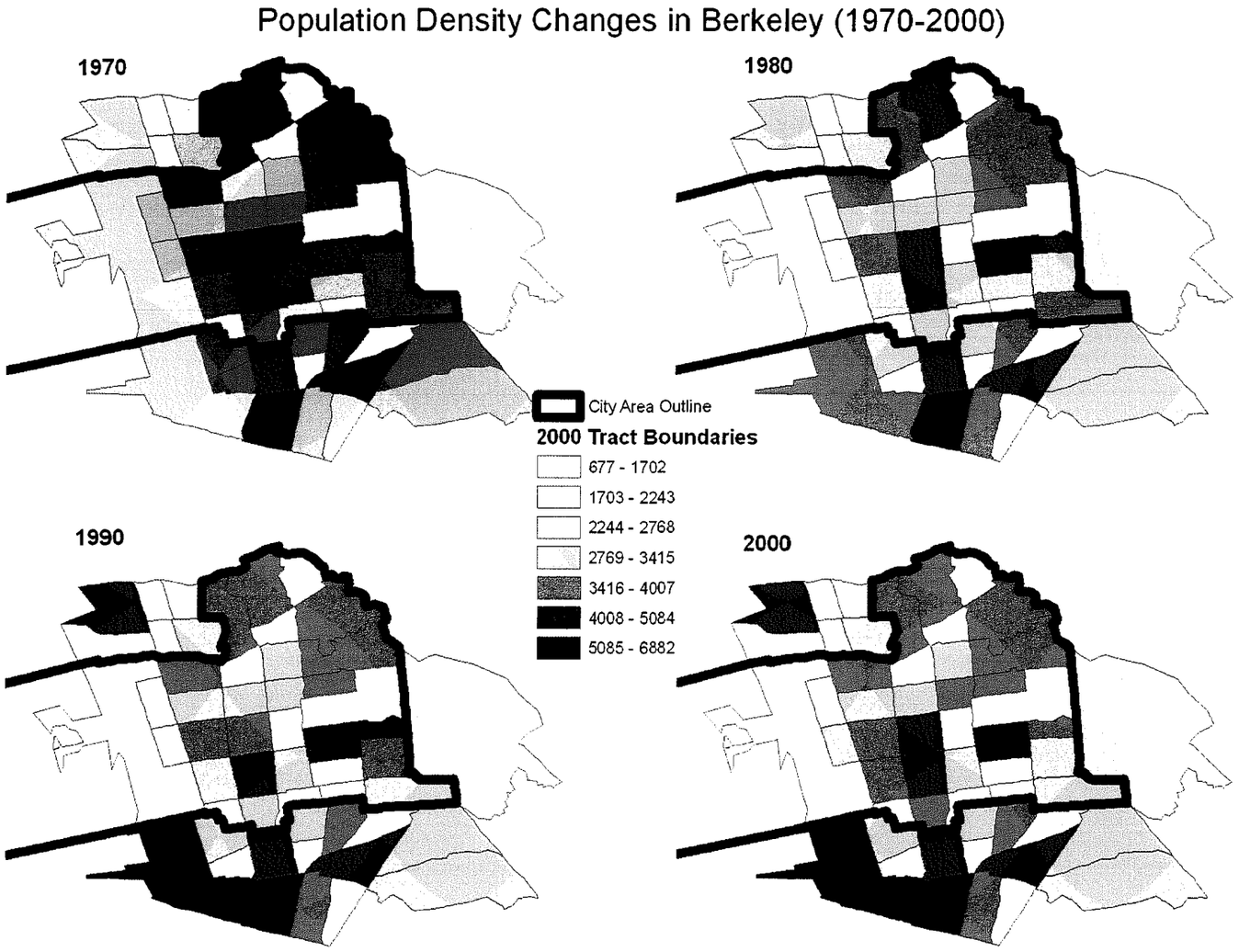
Future Research

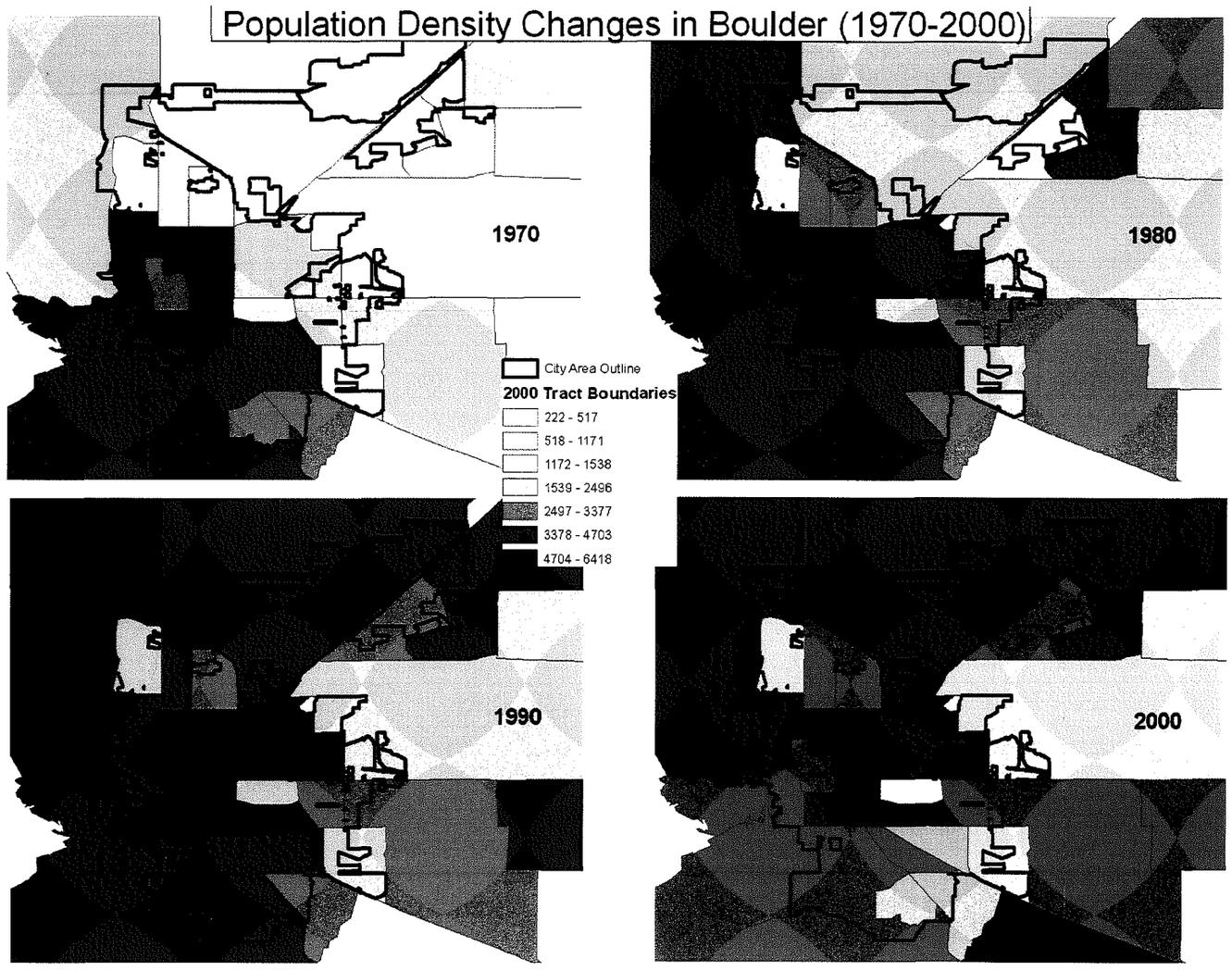
The relationship between place of employment and place of residence in communities with urban growth regulations remains a mystery, and warrants further

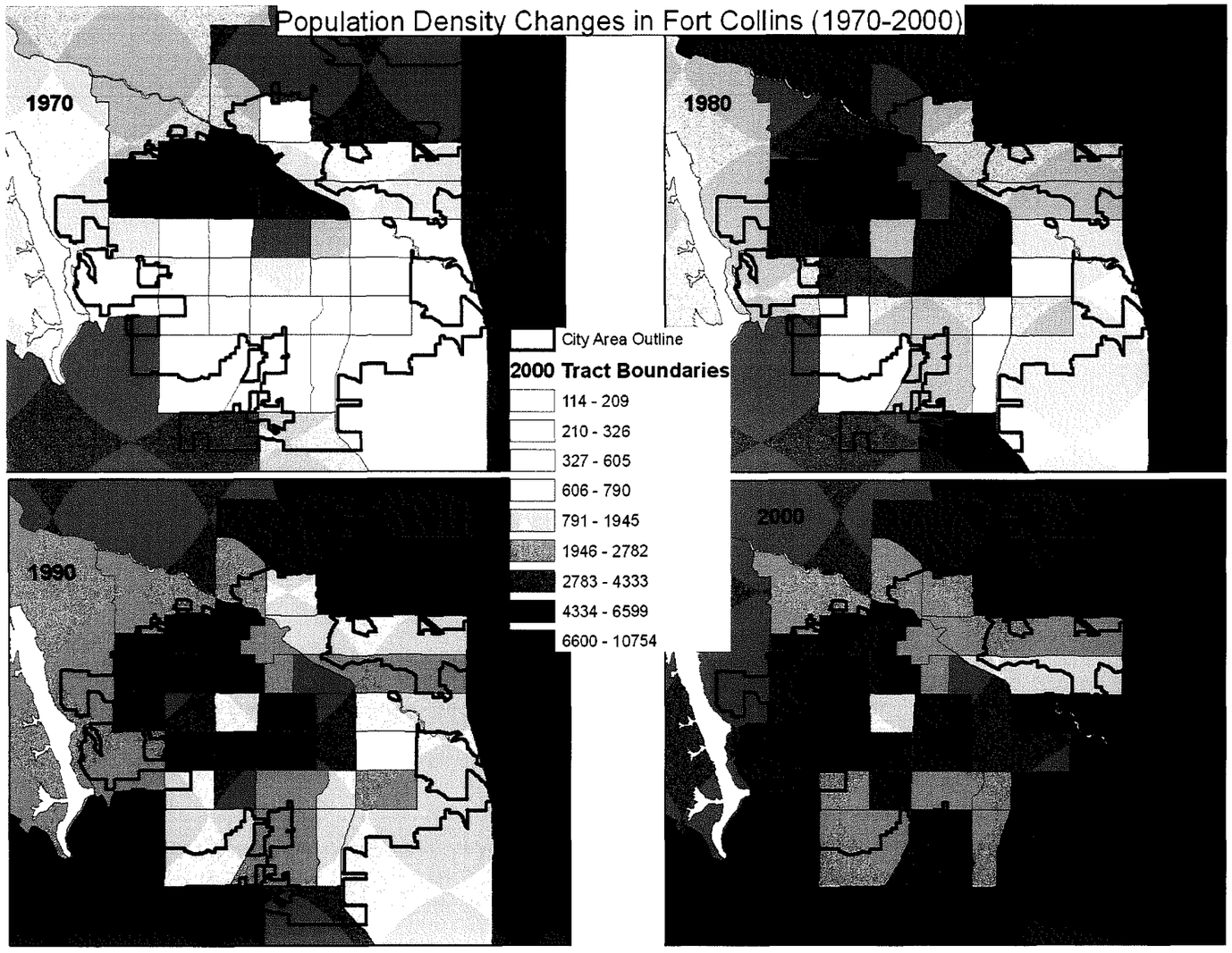
research. No study to date has found conclusive evidence on the effects of regulation on the quality of community life or on the quality of public services and amenities. An update to Protash and Baldassare's 1977 study of citizen satisfaction in communities with urban growth controls and strict planning guidelines would be of interest. Since land use regulation is becoming more prevalent, a national database with the status of individual city policies would be incredibly useful in discerning the effects of growth restrictions. A national database would show regional trends and allow for more state-to-state comparisons. The economics and externalities of urban growth regulations is a topic area that continues to grow and expand. There is a substantial amount of existing literature, however a very substantial gap remains in between what we know, and what we can learn.

APPENDIX

The three maps on the following pages detail population density changes. They have been generated using the US Census Neighborhood Change Database and Geolytics. Note that each city has a different legend. The borders represent the boundaries of each city.


Population Density Changes in Berkeley (1970-2000)
1970
1980
1990
2000
City Area Outline
2000 Tract Boundaries
677 - 1702
1703 - 2243
2244 - 2768
2769 - 3415
3416 - 4007
4008 - 5084
5085 - 6882


Population Density Changes in Boulder (1970-2000)
1970
1980
1990
2000
City Area Outline
2000 Tract Boundaries
222 - 517
518 - 1171
1172 - 1538
1539 - 2496
2497 - 3377
3378 - 4703
4704 - 6418


Population Density Changes in Fort Collins (1970-2000)
1970
1980
1990
2000
City Area Outline
2000 Tract Boundaries
114 - 209
210 - 326
327 - 605
606 - 790
791 - 1945
1946 - 2782
2783 - 4333
4334 - 6599
6600 - 10754

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