Do We Know Regulatory Barriers When We See Them? An Exploration Using Zoning and Development Indicators

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Abstract

Many studies have demonstrated that zoning by local governments can have adverse effects on housing production and, consequently, on housing affordability. Most of these studies, however, use coarse measures of zoning regulations and thus provide little information about the nature and patterns of zoning itself. As a result, these studies offer little information that is useful in identifying when and where regulatory barriers exist.

This article offers a detailed analysis of zoning patterns and housing market performance at the jurisdictional level in three metropolitan areas and provides further evidence that zoning can serve as a barrier to the construction of high-density, multifamily housing. The analysis also demonstrates that such disaggregated information can be used to identify and perhaps address regulatory barriers to affordability.

Keywords: Affordable housing; Land use; Multifamily housing

Introduction

Evidence from a variety of sources makes a compelling case that low- and moderate-income households in the United States have a housing affordability problem. The root causes of this problem are complex and controversial

and vary by region, but the regulations imposed by local governments are clearly involved. In 1991, in its report to the president, the U.S. Department of Housing and Urban Development's (HUD's) Advisory Commission on Regulatory Barriers to Affordable Housing found that various regulatory barriers can

1. Directly raise development costs by as much as 20 to 35 percent
2. Prevent the development of affordable housing in areas of high job growth, forcing lower-income households to live far from job opportunities
3. Restrict the full range of market-rate and affordable housing options, such as higher-density housing, multifamily rental housing, accessory units, and manufactured homes

Regulatory barriers come in many forms, including land use regulations (such as plan designations and zoning), environmental regulations, impact fees and exactions, and numerous forms of procedural requirements (Quigley and Rosenthal 2005). The focus of this article, however, is zoning—specifically, zoning that imposes restrictions on the type and density of housing development. Although there is ample evidence that zoning can have adverse effects, its nature and pattern within and across metropolitan areas has yet to be carefully explored. As stated by Pendall, Puentes, and Martin, "[D]espite [its] fundamental importance, too little is known about the current landscape of housing regulation in the United States" (2006, 2).

Researchers who demonstrate that zoning can have adverse effects on housing affordability typically offer one of two policy prescriptions: restrict the rights of local governments to zone or require state or regional governments to oversee local zoning practices. Successful implementation of either option will require a more detailed analysis of local zoning practices, especially within metropolitan areas. That is what we offer here.

Our analysis is motivated by the belief that local governments use zoning to exclude affordable housing and its occupants. "Exclusion" and "affordable," however, are value-laden terms and difficult to define. Thus, our focus is more limited: to document and examine in three case studies how zoning practices and patterns vary within and across metropolitan areas. Because high-density, multifamily housing is generally more affordable than low-density, single-family housing, it is likely that zoning barriers to high-density, multifamily housing also act as barriers to affordability. But because there

are many unaffordable multifamily and high-density housing developments, our research does not systematically address the indirect question of how zoning might affect affordability.

We will proceed as follows. After examining previous research, we will describe our methods and define several indicators of housing development and regulatory stringency. We will then present aggregate indicator values for three case-study metropolitan areas and discuss their differences. Next we will present indicator values and illustrations for the jurisdictions within the three areas. We will conclude with a discussion on the use of indicators as a tool for assessing and addressing barriers to high-density, multifamily housing.

Previous research

The literature on the effects of zoning on land and housing markets is large and diverse. As described in a recent review by Ihlanfeldt (2004), studies have used simple to complex methods to identify the correlates, consequences, and motivations of "exclusionary" zoning. According to Ihlanfeldt (2004), the evidence that zoning reduces housing production and increases housing prices is strong, while the evidence that zoning causes racial segregation and job-housing imbalance is tenuous or mixed.

The methods used in these studies vary widely, as do the measures of exclusionary zoning. In general, the precision of zoning measures in these studies declines as the unit of analysis increases in geographic size. Studies that employ individual properties as the unit of analysis, for example, often have precise measures of allowed uses and densities (Fischel 1990; Lynch and Rasmussen 2004). Studies that employ jurisdictions or subareas of jurisdictions often use indexes of zoning restrictiveness—typically based on weighted averages of land in various zoning classifications (Cho and Linneman 1993; Pollakowski and Wachter 1990). Studies that employ metropolitan areas or large samples of jurisdictions often use the results of surveys as measures of zoning restrictiveness (Malpezzi 1996; Mayer and Somerville 2000; Pendall 2000). In these studies, the results of survey responses are typically recorded as "counts" of regulatory tools used. All of these studies provide important insights into the causes and potential effects of zoning, but only limited information on the nature and patterns of zoning itself.

A few studies have taken a close look at zoning ordinances in multiple metropolitan areas. Talen and Knaap (2003), who collected comprehensive plans and zoning regulations from 167 cities and 37 counties in Illinois,

found that most zoning ordinances impose greater setbacks, lot sizes, and parking requirements than the model standards established by the American Planning Association. Knaap and Nedovic-Budic (2004), who surveyed regional planning agencies and metropolitan planning organizations in the 50 largest metropolitan areas in the country, found that most collected detailed information on land use, transportation infrastructure, and travel behavior, but that very few maintained information on planning or zoning regulations for entire metropolitan areas. Pendall, Puentes, and Martin (2006) surveyed local jurisdictions in the 50 largest metropolitan areas in the United States and recorded the restrictions in zoning ordinances and comprehensive plans. These authors found distinct regional differences in the style of land use regulations—differences that produce a variety of effects on the housing opportunities of local residents.

Research strategy

To shed new light on zoning patterns and housing market performance, we took the following three steps. First, we selected three areas where we could obtain metropolitan-wide zoning data in geographic information system (GIS) format. We then computed indicators of housing prices and rents, housing production, and zoning constraints. Finally, we analyzed state, regional, and local regulatory environments.

In this article, we analyze the information without using inferential statistics and consider whether there is evidence that zoning presents a barrier to high-density, multifamily housing. We will examine each of the three steps in turn and will conclude by discussing the use of indicators as a tool for assessing and addressing regulatory barriers to affordable housing.

Selection of study areas

We first collected data on the 50 largest metropolitan areas in the nation, seeking study areas that were diverse with respect to rates of growth, regulatory environments, housing prices and rents, and location. We then contacted regional government officials to determine the availability of GIS data and the likelihood of local cooperation. This narrowed the pool of candidates dramatically. Metropolitan-wide zoning data in GIS format were available for only two areas: Portland (OR) and Boston. From other projects, we already had zoning data in GIS format for Miami–Dade County and for the Washington, DC, metropolitan area. Metropolitan data were available for Minneapolis–St. Paul and Sacramento (CA) on comprehensive plan designa-

tions, but not on zoning. Thus we focused our study on these six metropolitan areas. Due to space limitations, however, we report the results for only three of them:[1] Boston, Miami–Dade County, and Portland.

We make no claims that these are prototypical or representative of all metropolitan areas in the United States. We do claim, however, that they offer a range of regulatory environments—including environments based on traditional zoning (Boston), concurrency requirements and impact fees (Miami–Dade County), and comprehensive growth controls (Portland). We also claim that a careful quantitative and qualitative analysis of zoning and development patterns in these metropolitan areas offers insights not available previously.

Indicator analysis and data visualization

The primary objective of our research was to gain new insights into residential zoning and housing development patterns in selected metropolitan areas. We pursued this objective by using indicator analysis and data visualization.

Indicator analysis involved collecting data on populations and housing and analyzing how much land is zoned for various types of residential uses and what densities of development are permitted in each type. The results were then used to create a set of indicators that are comparable within and across study areas. Specifically, we focused on two general categories of indicators: housing market performance and zoning constraints.

Indicators of housing market performance. To obtain these indicators, we collected 1990 and 2000 census data on populations, households, single-family and multifamily housing units, median house prices, and median contract rents for jurisdictions in each study area (U.S. Bureau of the Census 1992, 2002). For each of these variables, we recorded levels and changes in levels from 1990 to 2000.[2]

[1]Our choice of case study areas for this article is based on the following considerations. First, we chose to focus on zoning, not comprehensive plan designation. This eliminated Sacramento and Minneapolis–St. Paul. Second, we had space to report on only three areas. We eliminated Washington, DC, because counties are the dominant jurisdictions with land use authority there. And most of the counties are large and have extensive urban, suburban, and rural tiers. Because we use jurisdictions as our unit of analysis, most differences in subregional zoning patterns get lost in jurisdictional averages and aggregates. For more information on all six study areas, see Knaap et al. (2007).

[2]The more detailed report from which this article was derived (Knaap et al. 2007) includes several additional indicators derived from census data. The indicators reported here are limited to those that capture housing prices and rents, housing construction relative to population growth, and single-family/multifamily splits.

Indicators of zoning constraints. To derive these indicators, we computed, for each jurisdiction with land use authority in each study area, the number of acres zoned for single-family, multifamily, commercial, industrial, public use/open space, and mixed use. Then, using only acres zoned for residential or mixed use, we computed the maximum number of units allowed by zoning for each jurisdiction (acres zoned for residential use times number of units per acre); the aggregate residential density (the total units allowed divided by the acres zoned for residential use); and the number of acres zoned for very low density (no more than one unit per acre), low-density (more than one but less than eight units per acre), and high-density (eight or more units per acre) use.[3]

All of these indicators are subject to a variety of measurement errors. Census data on populations and housing, for example, are often imprecise for small jurisdictions—especially data series based on samples. GIS data are subject to spatial imprecision, and zoning constraints are typically generalized into ranges (e.g., three to five units per acre). For this reason, we describe these measures as indicators. That is, while the measures we report provide a sound basis for comparison, they are imprecise. As a result, the most reliable indicators are constructed as ratios—such as the share of multifamily housing units, the percentage of land zoned for high-density development, and the ratio of price to income. Such ratios not only serve to normalize the measure by a common denominator, but also help offset measurement errors in both the numerator and denominator. Finally, while census data are collected for each of the three study areas in a relatively uniform manner, the precision and definitions of GIS data vary widely by study area. For this reason, comparisons of zoning constraints within study areas are more reliable than comparisons across areas.

In addition to the indicator analysis, census and GIS data were used for data visualization, which is a technique used to represent data and relationships among variables. Such a representation often reveals relationships or provides insights that tabular or Cartesian graphic representations cannot. Urban development and land use regulatory data are particularly well suited to this kind of representation.

[3]For more information on the computation of zoning indicators, see appendix A.

Regulatory analyses

Our analysis involved a detailed review of state, regional, and local land use regulations and began with statutory summaries completed as part of the American Planning Association's Growing SmartSM project. These summaries, which were current as of 1996, were reviewed for recent changes in legislation and updated in certain cases. In addition, we visited the Web sites of state and regional planning agencies to collect additional data in some cases. Next, for five jurisdictions in each study area, we reviewed local comprehensive plans and functional plans, with a particular focus on housing and land use elements, to determine which types of density ranges were incorporated and which kinds of projections and written and mapped policies related to multifamily housing. The five jurisdictions in each study area were chosen based on our assessment, using indicator values, of which might have zoning ordinances unfriendly toward multifamily, high-density development.[4]

For these five jurisdictions, we conducted a complete review of all provisions in local zoning ordinances that related to multifamily development, including documentation of density ranges, and use districts in which multifamily development was permitted, either by right or by conditional or special permit.[5] In addition, we noted where local zoning codes contained special provisions relating to affordable housing, such as density bonuses. In particular, we tried to identify situations where a local zoning ordinance did not allow multifamily residences by right, did not allow them at all, or contained unclear development standards (such as the lack of a specific minimum area per dwelling unit standard) or procedures that would make the development of such housing difficult or unlikely. We used this information to help describe the regulatory context and to ensure that the indicator values offer an accurate characterization of regulatory constraints.

On the basis of our review of indicator values and state and local zoning policies, we will address the following specific questions:

1. How much land and how many units are zoned for high-density or multifamily housing in particular jurisdictions?
2. How do zoning and development patterns vary within and across metropolitan areas?

[4]We use the term "multifamily, high-density" because we are interested in constraints on both. Some zoning regulations constrain density, some restrict housing types, and some do both. Census data include information on housing type but not, except by computation, on density.

[5]Discretionary and conditional permits are granted not by right, but only when certain conditions are met or at the discretion of the permitting authority.

3. Does it appear as if zoning presents a barrier to high-density, multifamily housing?
4. How can such information be used to assess and perhaps mitigate regulatory barriers to affordable housing?

Metropolitan-level results

Table 1 presents five sets of indicators for each study area. The indicators present information on aggregates, or averages, of jurisdictions in each area, not information for the entire census-defined metropolitan area. Specifically, the Boston data exclude jurisdictions with a population of less than 25,000, and the Portland and Miami–Dade County data exclude areas in unincorporated counties. The jurisdictions represent 50 percent, 63 percent, and 75 percent of the total metropolitan population in Boston, Miami–Dade County, and Portland, respectively, in 2000.

The first set of indicators measures levels and changes in housing prices, rents, and household incomes. All measures are unadjusted for inflation but

Table 1. Indicator Values for the Boston, Miami–Dade County, and Portland Study Areas

Indicator	Boston	Miami–Dade County	Portland
Housing Price			
Average median value of owner-occupied units ($) (2000)	249,824	241,903	184,625
Change in average median value of owner-occupied units ($) (1990–2000)	56,154	92,107	102,375
Average median rent for units ($) (2000)	774	705	648
Change in average median rent for units ($) (1990–2000)	165	181	243
Average median household income ($) (2000)	58,194	46,177	52,585
Change in average median household income ($) (1990–2000)	16,276	8,229	17,834
Average median value of units/average median household income (2000)	4.29	5.24	3.51
Change in average median value of units/change in average median household income (1990–2000)	3.45	11.19	5.74
Median contract rent for specified units/monthly) median household income (2000)	0.17	0.18	0.14
Change in median contract rent for specified units/change in monthly median household income (1990–2000)	0.16	0.19	0.15

Table 1. Indicator Values for the Boston, Miami–Dade County, and Portland Study Areas *Continued*

Indicator	Boston	Miami–Dade County	Portland
Housing Production			
Total housing units (2000)	914,991	471,557	440,847
Total households (2000)	882,088	411,324	415,298
Total multifamily housing units (2000)	567,406	270,175	157,446
Change in housing units (1990–2000)	35,845	44,383	103,551
Change in households (1990–2000)	57,223	36,096	95,659
Change in multifamily housing units (1990–2000)	13,660	20,896	43,875
Change in housing units/change in total households	0.63	1.23	1.08
Change in multifamily housing units/change in total housing units	0.38	0.47	0.42
Change in households (1990–2000)/total households (2000)	0.06	0.09	0.23
Total multifamily housing units (2000)/total housing units (2000)	0.62	0.57	0.36
Zoning—Acres			
Total residential acres/total households	0.27	0.15	0.23
Total residential acres/total acres	0.73	0.57	0.63
High-density acres/total residential acres	0.39	0.60	0.23
Low-density acres/total residential acres	0.54	0.33	0.69
Very low density acres/total residential acres	0.07	0.07	0.02
Zoning—Units			
Total zoned housing units/total existing housing units	1.50	1.90	2.16
High-density zoned housing units/total zoned housing units	0.78	0.84	0.48
Low-density zoned housing units/total zoned housing units	0.21	0.12	0.38
Mixed-use zoned housing units/total zoned housing units	*	0.03	0.14
Very low density zoned housing units/total zoned housing units	0.01	0.004	0.002
Zoning—Density			
Total zoned housing units/total residential acres	5.83	14.87	10.07
High-density units/high-density acres	11.79	20.61	21.01
Low-density units/low-density acres	2.24	5.82	5.55
Mixed-use units/mixed-use acres	*	45.45	22.06
Very low density units/very low density acres	0.54	0.97	1.00

Note: Mixed use is not a category in the generalized zoning layers indicated by an asterisk. Very low density means no more than one unit per acre. Low density means more than one but less than eight units per acre. High-density means eight or more units per acre.

are readily comparable across study areas. Because of mobility constraints, regional housing affordability is best captured by ratios of housing prices and rents to incomes. Local housing affordability is best captured by levels of housing prices and rents. To identify jurisdictions with potential barriers to affordable housing, we are particularly interested in jurisdictions where prices and rents are high or rising, relative to the rest of the study area.

The second set of indicators provides information on existing housing stocks in 2000, housing production from 1990 to 2000, and relative shares of single and multifamily units. Because the size and definitions of each of the study areas vary, the most useful indicators are ratios that reveal, for example, the growth of the housing stock relative to growth in population, the multifamily share of existing housing units, and growth in multifamily housing units relative to growth in total housing units. To identify jurisdictions with potential barriers to high-density, multifamily housing, we are particularly interested in jurisdictions where the rate of housing development is high, but the existing growth in the proportion of multifamily housing is low. These are jurisdictions that are not built out and are seeing strong demand, but where multifamily housing is not being produced.

The third set of indicators characterizes existing zoning regulations. Again, because the size of the jurisdictions varies considerably, the most revealing indicators are expressed as ratios. Total zoned housing units (number of acres zoned for residential use times units per acre allowed) divided by existing units, for example, captures regulatory capacity for growth: In relative terms, is there room to grow? The ratio of the acres zoned for high-density residential use divided by the total acres zoned for residential use captures the share of residential land zoned for high-density use. These indicators offer quantitative measures of the relative extent to which barriers to multifamily, high-density development could be the result of low proportions of *land* zoned for such use. Regulatory capacity for high-density housing is captured by the ratio of housing units zoned for high-density development relative to total housing units allowed by zoning. These indicators offer quantitative measures of the extent to which barriers to multifamily, high-density housing could be the result of low proportions of *units* zoned for such use. Finally, aggregate zoned density is measured by total zoned housing units divided by total residential acres. These indicators offer quantitative measures of the extent to which high-density, multifamily development could be the result of constraints on density.[6]

[6]The dates of the zoning data vary by study area and to some extent by jurisdiction. In all cases, the data are the most current available, which may reflect conditions in 1990 or 2000 only to a limited extent. See appendix A.

A quick review of some of the metropolitan-level indicators offers several insights into housing markets and regulatory environments. Of the three study areas, Boston had the highest housing prices and rents in 2000. This is likely in part the result of low housing production from 1990 to 2000. For every household added over this period, the area added only 0.63 housing units. And while the share of multifamily housing units here remains high, the share of multifamily units built during the 1990s was half the level in 2000.

As suggested by Glaeser, Schuetz, and Ward (2006), zoning could well be the cause of low rates of housing production in general and multifamily housing in particular. The Boston study area is zoned for only 1.5 times the number of housing units in 2000. And while the share of acres zoned for high-density use is high, the overall zoned density of residential land is low.

Housing prices and rents are also fairly high in the Miami–Dade County study area and indeed are the highest of the three relative to incomes. Housing production during the 1990s, however, was robust. The study area added 1.23 housing units for every household added from 1990 to 2000, and the share of multifamily housing units built over the same period remained at nearly 50 percent. At the metropolitan level, there is little evidence that zoning represents a barrier to housing development. The number of housing units allowed by zoning is about double the number in 2000. The share of acres and housing units zoned for high density is large, and the overall density of land zoned for residential use is high. One likely reason for the high prices and rents in this study area, despite robust rates of housing production, is the strong demand for vacation homes and condominiums and the relatively low resident median income.

Compared with Boston and Miami–Dade County, housing prices and rents in the Portland study area were relatively low in 2000 even in proportion to median incomes. Between 1990 and 2000, however, housing prices and rents rose more in Portland than in the other two study areas. Portland added 1.08 housing units for every additional household from 1990 to 2000, and the share of multifamily units increased to 0.42. Despite its reputation for regulatory stringency, the Portland study area has the zoned capacity to double its housing stock, nearly half of its units are zoned for multifamily, and the overall density of land zoned for residential use is nearly as high as in Miami–Dade County. One likely reason for the relatively rapid increase in housing prices and rents, despite robust housing production and accommodating zoning, is the relatively rapid rate at which prices and rents in Portland caught up with other western cities after the economic recession of the 1980s (Downs 2002).

Of course, it is difficult to draw firm conclusions based on aggregate data from just three metropolitan areas. As will be shown, regulatory constraints, housing production rates, and prices and rents vary greatly within each of these metropolitan areas. Additional insights can be obtained by a closer examination of submetropolitan differences.

Submetropolitan results: Boston

The Boston study area includes parts of five counties: Essex, Middlesex, Norfolk, Suffolk, and Worcester. Because of the large number of jurisdictions, only those with more than 25,000 residents in 2000 are included in the analysis. Using this criterion keeps the analysis focused on jurisdictions of significant size but eliminates small and perhaps rapidly growing jurisdictions where barriers to multifamily housing could well exist.[7]

Regulatory context

Cities and towns in Massachusetts have primary authority for planning and regulatory control of land use and development; there is no single state planning agency. Cities and towns with populations over 10,000 must establish planning boards, which are empowered to undertake studies and prepare plans managing resources, possibilities, and needs. These boards are required to prepare a master plan that may serve as a basis for decisions on the long-term physical development of the municipality.

Most cities or towns are members of regional planning commissions, which develop comprehensive plans for their regions and assist the local planning boards of cities and towns. The regional planning commission for Boston is the Metropolitan Area Planning Council, which is responsible for preparing a regional plan for the 101 cities and towns under its jurisdiction. MetroPlan, as it is called, was revised in 2005. Housing is included as one of the elements, and the stated goal is to provide a variety of housing opportunities. The state has adopted an affordable housing appeals act (Chapter 40B), which is described in more detail later.[8]

[7]Glaeser, Schuetz, and Ward (2006), for example, found that the communities with lot sizes in excess of 70,000 square feet cover 10 percent of the land in Boston but contain only 4 percent of the population.

[8]A new law, Chapter 40R, the Smart Growth and Housing Production Act, creates incentives to produce affordable housing. To participate in the voluntary plan, municipalities agree to create special "smart-growth" zoning districts close to transportation nodes, town centers, or vacant retail and commercial sites where housing could be built on less costly lots. The law requires that at least 20 percent of units in residential projects with more than 12 units be affordable and provides mechanisms to ensure that at least 20 percent of the total residential units built in the districts are affordable. Participating jurisdictions are eligible for some incentives to build affordable housing. This law was passed after the study period, however.

Indicator analysis

Indicators for the Boston study area were derived from data from the U.S. Bureau of the Census (1992, 2002) and from Massachusetts Office of Geographic and Environmental Information (MassGIS) (2004). Because jurisdictions in the Boston area were limited to those with more than 25,000 residents, census data provide fairly accurate information for every jurisdiction (problems of sample size are relatively minor). The zoning data obtained from MassGIS are of reasonably high quality, but the generalization of local ordinances is coarse and masks some important distinctions in density. Also, the zoning data do not include a mixed-use category.

Housing prices and rents. As shown in table 2, housing prices in 2000 were high throughout the Boston metropolitan area. Median housing prices ranged from $145,000 to nearly $600,000. Only two jurisdictions had median housing prices below $150,000. Rents are also consistently high, though percentage differences in rents between Boston and the other study areas are much lower than the percentage differences in prices. Differences in rents within the metropolitan area are also not nearly as large.[9] As shown in figure 1, the highest housing prices and rents in the region were in the suburbs just west of Boston near Harvard University and the Massachusetts Institute of Technology. With the exception of Newton, prices and rents rose most rapidly in the same jurisdictions.

Housing production and mix. All jurisdictions gained households between 1990 and 2000, and only two lost housing units. But in many jurisdictions, the growth in units was far less than the increase in households. Most jurisdictions also gained multifamily units, but the share of such units in most jurisdictions declined from 1990 to 2000; 11 jurisdictions lost multifamily housing units over this period. The share of multifamily development was less than 25 percent from 1990 to 2000 in several cities, including several of the highest-price communities and several of the lower-priced ones.

Zoned density and mix. Much of the residential land in the Boston metropolitan area is zoned for single-family use but at moderately high densities. Sizable proportions of land in many jurisdictions fall into MassGIS category R5, which designates single-family use up to 8.7 units per acre. Because our generalization rules placed land zoned for more than 8 units per acre into the high-density category, much of the land zoned for single-family use in the Boston area is classified as high density.

[9]The relatively smaller variation in rents relative to prices suggests that zoning may have a greater impact on the asset values of houses than on explicit or implicit rents.

Table 2. Zoning and Development Indicators for the Boston Study Area

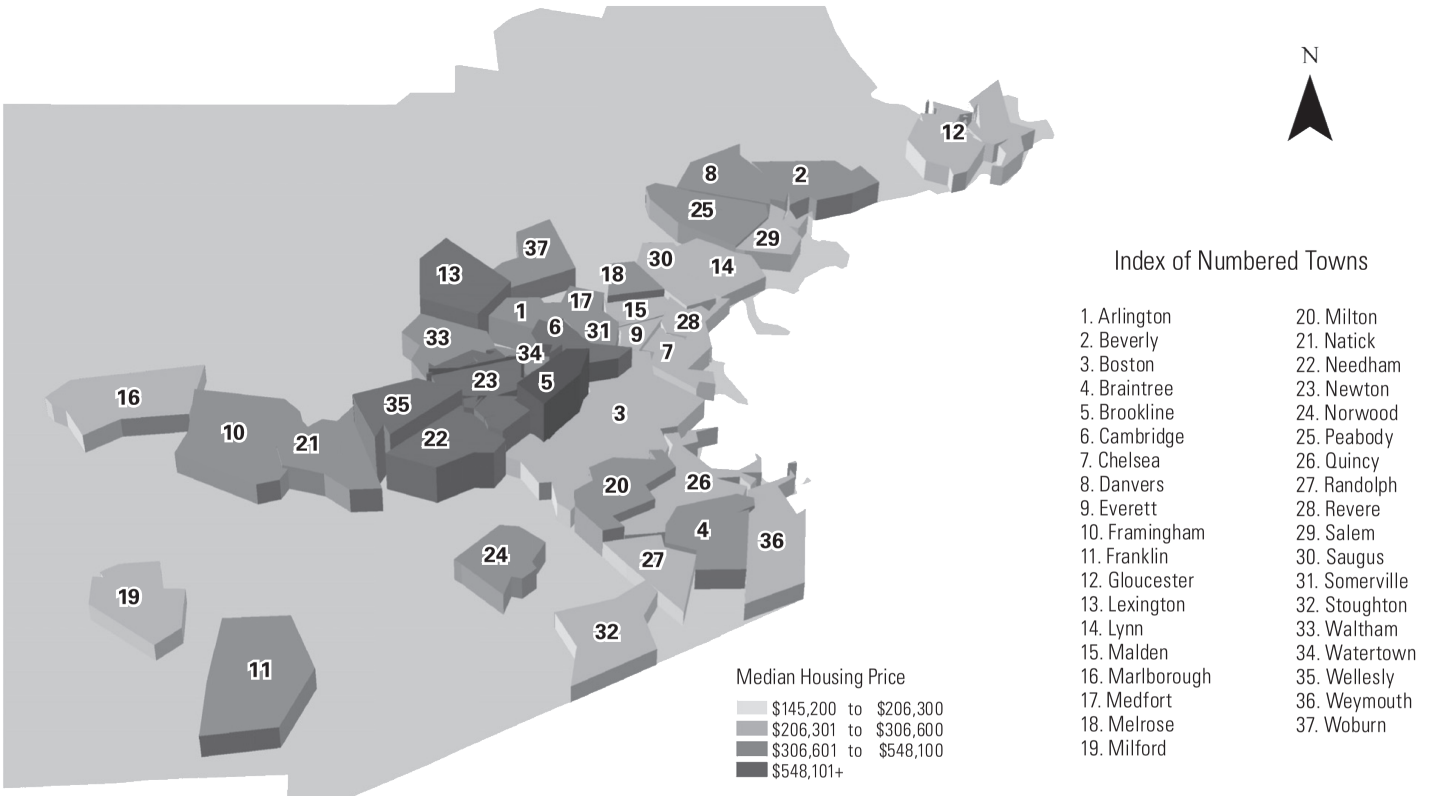
	Total Households (2000)	Change in Households (1990–2000)	Median Value of Specified Owner-Occupied Units ($) (2000)	Change in Median Value of Specified Owner-Occupied Units ($) (1990–2000)	Median Contract Rent for Specified Units ($) (2000)	Change in Median Contract Rent for Specified Units ($) (1990–(2000)	Total Housing Units/Total Households (2000)	Change in Total Housing Units/ Change in Total Households (1990–2000)	Total Multi-family Units/ Total Housing Units (2000)	Change in Total Multi-family Units/ Change in Total Housing Units (1990–2000)	Total Zoned Housing Units/ Total Existing Housing Units	High-Density Zoned Housing Units/ Total Zoned Housing Units	High-Density Acres/ Total Residential Acres	Total Zoned Housing Units/ Total Residential Acres
Arlington	19,011	192	283,800	74,600	870	179	1.02	–0.05a	0.57	–10.00b	1.45	1.00	0.99	8.67
Beverly	15,750	954	224,800	47,600	673	90	1.03	0.65	0.45	0.06	2.28	0.77	0.35	4.44
Boston	239,528	11,064	190,600	29,200	722	176	1.05	0.10	0.83	0.97	1.19	0.96	0.92	18.56
Braintree	12,600	704	212,000	43,300	667	90	1.03	1.14	0.27	0.35	1.05	0.00	0.00	2.67
Brookline	25,594	1,237	599,500	221,700	1,212	583	1.03	0.84	0.79	1.15	1.08	0.87	0.52	6.94
Cambridge	42,615	3,210	398,500	134,700	912	429	1.05	0.86	0.85	0.68	1.27	1.00	1.00	19.57
Chelsea	11,888	1,335	149,200	7,200	618	117	1.04	0.57	0.88	1.08	1.41	1.00	1.00	24.32
Danvers	9,555	742	231,100	45,600	686	84	1.02	0.87	0.28	0.26	1.55	0.04	0.01	2.24
Everett	15,435	907	164,500	8,400	651	130	1.03	0.54	0.78	1.58	0.60	1.00	1.00	8.71
Framingham	26,153	1,038	216,700	32,000	764	138	1.02	0.32	0.47	– 0.39a	2.24	0.77	0.38	4.26
Franklin	10,152	6,704	227,100	63,400	618	176	1.02	1.00	0.24	0.13	1.80	0.03	0.00	1.28
Gloucester	12,592	1,013	204,600	27,500	608	107	1.11	0.82	0.43	0.05	3.12	0.48	0.15	2.74
Lexington	11,110	595	417,400	134,600	1,209	307	1.02	0.83	0.16	0.55	2.09	0.02	0.01	2.51
Lynn	33,511	1,957	145,200	6,000	540	33	1.04	0.01	0.63	–36.10a	1.23	1.00	1.00	10.88
Malden	23,009	1,088	176,100	13,200	709	134	1.03	0.38	0.69	–0.55a	1.20	1.00	1.00	10.60
Marlborough	14,501	2,349	190,600	24,300	744	109	1.03	0.80	0.44	0.24	2.04	0.55	0.20	3.12
Medford	22,067	238	226,800	44,400	734	155	1.03	0.16	0.62	–2.54a	1.38	1.00	1.00	10.78
Melrose	10,982	41	254,400	58,300	711	123	1.02	–1.20a	0.41	2.33c	2.12	0.93	0.80	8.40
Milford	9,566	844	170,300	10,700	600	107	1.12	1.83	0.39	0.06	1.73	0.40	0.12	2.52
Milton	8,982	233	285,800	66,200	723	111	1.02	0.68	0.19	–0.24a	2.60	0.68	0.21	2.84
Natick	13,080	1,071	247,800	60,200	820	103	1.02	6.89	0.34	0.02	2.01	0.32	0.08	2.87

Table 2. Zoning and Development Indicators for the Boston Study Area *Continued*

	Total Households (2000)	Change in Households (1990–2000)	Median Value of Specified Owner-Occupied Units ($) (2000)	Change in Median Value of Specified Owner-Occupied Units ($) (1990–2000)	Median Contract Rent for Specified Units ($) (2000)	Change in Median Contract Rent for Specified Units ($) (1990–(2000)	Total Housing Units/Total Households (2000)	Change in Total Housing Units/ Change in Total Households (1990–2000)	Total Multi-family Units/ Total Housing Units (2000)	Change in Total Multi-family Units/ Change in Total Housing Units (1990–2000)	Total Zoned Housing Units/ Total Existing Housing Units	High-Density Zoned Housing Units/ Total Zoned Housing Units	High-Density Acres/ Total Residential Acres	Total Zoned Housing Units/ Total Residential Acres
Needham	10,612	452	385,600	129,100	1,166	368	1.02	0.98	0.20	0.70	3.43	0.87	0.48	4.87
Newton	31,201	1,746	438,400	145,000	1,000	191	1.03	0.92	0.40	0.67	1.39	0.70	0.42	5.18
Norwood	11,623	605	219,800	40,800	820	151	1.03	0.60	0.45	–0.35a	2.32	0.87	0.69	6.89
Peabody	18,581	1,025	215,900	38,800	634	111	1.02	0.64	0.33	0.08	2.19	0.70	0.37	5.02
Quincy	38,883	3,205	185,700	24,600	744	145	1.03	0.74	0.61	0.77	0.97	0.69	0.65	8.89
Randolph	11,313	427	161,200	6,200	817	138	1.02	0.63	0.29	–0.14	4.51	1.00	1.00	8.97
Revere	19,463	2,025	168,200	7,700	663	109	1.04	0.72	0.64	0.46	1.19	1.00	1.00	9.87
Salem	17,492	1,686	188,700	25,100	634	95	1.04	0.60	0.67	0.81	0.63	0.00	0.00	2.79
Saugus	9,975	689	204,100	37,400	636	112	1.01	0.79	0.24	–0.07a	1.30	0.16	0.02	2.53
Somerville	31,555	1,236	214,100	48,300	797	206	1.03	0.56	0.88	0.71	1.12	1.00	1.00	20.85
Stoughton	10,254	860	174,200	17,900	641	74	1.02	0.85	0.28	0.38	1.09	0.00	0.00	1.35
Waltham	23,207	2,479	250,800	59,700	792	159	1.03	0.87	0.58	0.53	1.87	0.89	0.65	8.48
Watertown	14,629	439	270,600	73,900	968	246	1.03	0.59	0.72	0.47	0.86	0.94	0.93	8.66
Wellesley	8,594	122	548,100	198,600	966	224	1.03	0.80	0.14	–0.42a	2.71	0.67	0.35	4.56
Weymouth	22,028	1,199	182,700	25,500	777	138	1.02	0.53	0.37	–0.45a	1.19	0.21	0.04	3.53
Woburn	14,997	1,512	218,600	46,000	809	158	1.03	0.85	0.43	0.44	3.29	1.00	1.00	8.71
Total	882,088	57,223	249,824	56,154	774	165	1.04	0.63	0.62	0.38	1.50	0.78	0.39	5.83

[a]These values were formed by ratios in which the numerator was negative.
[b]These values were formed by ratios in which the denominator was negative.
[c]These values were formed by ratios in which the both the numerator and the denominator were negative.

Figure 1. Median Housing Prices in Boston in 2000



As a result, many jurisdictions have large proportions of land zoned for high-density use; for some, it is as much as 100 percent. Even with this generous definition, however, several jurisdictions have little or no land zoned for high-density use. Most of the jurisdictions with little or no land (or units) zoned for high-density use are not among those with the highest prices and rents.

Zoned densities in the Boston study area vary considerably. A few are zoned for nearly 20 units per acre, but most are zoned for less than 10 and many for less than 5. The spatial distribution of zoned densities is illustrated in figure 2. As shown, the west-central cities of Cambridge, Chelsea, and Somerville are jurisdictions with the highest overall zoned densities. Jurisdictions zoned for very low densities are located throughout the metropolitan area, including most of the other suburbs.

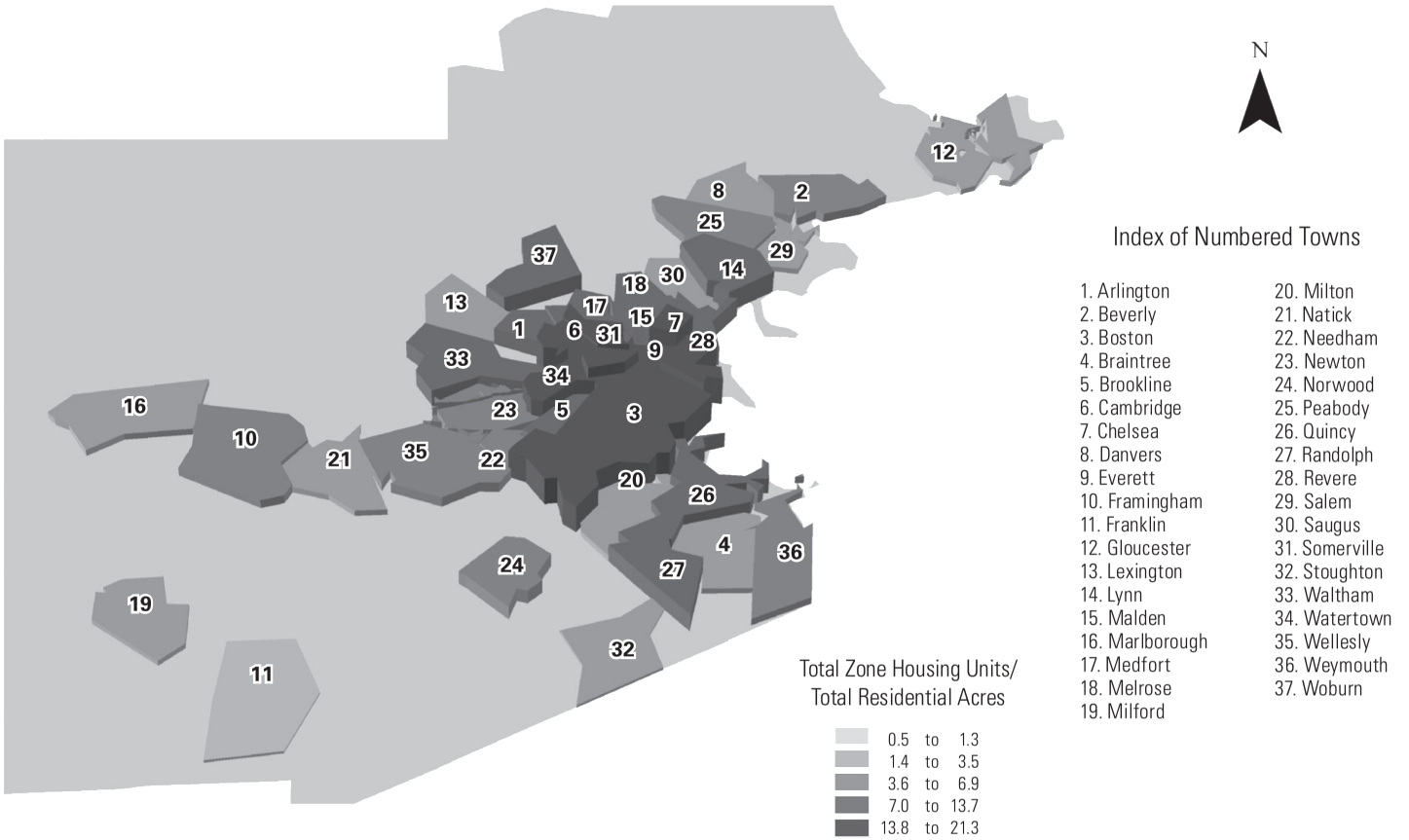
Contrasting figure 1 with figure 2 reveals that many of the highest-priced communities have the lowest zoned densities. These include the high-priced communities of Brookline, Lexington, Newton, and Needham. The outer suburbs of Beverly, Danvers, and Franklin also have relatively high prices and low zoned densities. This combination does not provide prima facie evidence that zoning represents a barrier to multifamily, high-density development in these communities, but does suggest that this might be a good place to look for barriers.

Summary assessment

The Boston metropolitan area has one of the most severe housing affordability problems in the nation for at least two reasons: Housing production has failed to keep up with population growth, and the share of multifamily housing has fallen dramatically. There may be many reasons for the lack of housing production, but zoning is likely one of them. Zoned densities vary widely in the study area, from 1.3 units to 24.3 units per acre in the least and most densely zoned jurisdictions. Boston itself is dense, has high housing prices, and has a consistently high share of multifamily housing. Cambridge follows a similar pattern. Many communities, though, have little or no land zoned for high-density or multifamily housing, and many of them tend to have the highest housing prices.

A review of local regulations revealed that some of the communities with low densities and high prices appear to have land use policies in place that impede the development of multifamily housing. If such housing is allowed at all, it is only through a discretionary permitting procedure, such as a conditional use permit, and not by right through advance designation of land zoned for multifamily uses.

Figure 2. Zoned Residential Densities in Boston



The response of the Commonwealth of Massachusetts to local zoning practices has been to establish a state-level housing appeals board with the authority to overturn local decisions that reject affordable housing projects or impose conditions that make them economically infeasible. While this law (Chapter 40B) has had some success in getting otherwise recalcitrant local governments to approve affordable projects, it does not address the larger issue of increasing the supply of all housing, and in particular multifamily housing, whether it is for low- and moderate-income households or not. Until housing policies address the issue at this level, the Boston area will continue to have some of the most expensive housing in the nation (Meck, Retzlaff, and Schwab 2003).

Submetropolitan results: Miami–Dade County

This study area includes every city in the county with land use authority but excludes unincorporated Dade County. Jurisdictions vary significantly in size, and many are quite small. Several of the southernmost jurisdictions, especially Homestead, were significantly affected by Hurricane Andrew in August 1992.

Regulatory context

Florida's integrated planning and growth management system includes plans and regulations at three levels of government. The State Comprehensive Plan provides policy direction for all government levels. State agencies must adopt plans to implement pertinent portions of the State Comprehensive Plan. At the regional level, each regional planning council must adopt a plan that is consistent with the State Comprehensive Plan, but shaped by regional circumstances and conditions. At the local level, each county and municipality must adopt a local comprehensive plan that is consistent with state and regional plans. The local plan must contain a housing and land use element. The state government reviews local plans for compliance with statutory criteria and administrative rules.

Each of the comprehensive planning districts in the state has a regional planning council, which is responsible for preparing a strategic regional policy plan that addresses five subject areas: affordable housing, economic development, emergency preparedness, natural resources of regional significance, and regional transportation. Regional plans must be consistent with the state plan. Once adopted, the strategic regional policy plan is to provide the basis for regional review of developments that have regional impact, regional review of federally assisted projects, and other regional comment functions.

Indicator analysis

Because many jurisdictions in the study area are small, census data are subject to considerable measurement error, especially for data series based on samples. Also, the jurisdiction-level indicator values vary widely, because they capture small differences in population and housing patterns that are not averaged over large geographic regions. The zoning data were obtained from Miami–Dade County but generalized by us.

Housing prices and rents. As shown in table 3, housing prices and rents were relatively high in the Miami–Dade County study area in 2000, but prices and price increases varied dramatically. Median prices in 2000 ranged from less than $70,000 to over $1,000,000; increases from 1990 to 2000 ranged from less than $20,000 to half a million. Rents and increases in rents also varied dramatically. In Key Biscayne, median rents increased by more than $600 from 1990 to 2000, while rents in Doral fell by more than $100.

Figure 3 illustrates the pattern of housing prices in the study area. With the exception of the city of Miami, the highest housing prices are found along the ocean, with very high prices in several small shoreline communities. Prices are also high in suburban Coral Gables and Pinecrest.

Housing production and mix. Several jurisdictions in the study area lost households between 1990 and 2000. Some lost a significant amount of multifamily housing stock. The change in total housing units over the change in households, although significantly greater than 1 for the entire study area, varied widely across jurisdictions.[10]

The share of multifamily housing units in 2000 ranged from zero to 94 percent. For many communities, multifamily units made up a significant share of the housing units added from 1990 to 2000. In several jurisdictions, every net housing unit added from 1990 to 2000 was multifamily. Other communities gained multifamily units, but the multifamily share of total new housing units fell at the same time.

Zoned density and mix. Many jurisdictions have large shares of residential land zoned for high-density use. Throughout the study area, 61 percent of residential acres are zoned for such use. Many communities, however, have less than 15 percent of residential acres zoned for high-density use; Miami Shores and Pinecrest have almost none.

Total zoned residential density varies from 2.1 units per acre in Pinecrest to 49.6 units per acre in Sunny Isles Beach. Several are zoned for more than 20 units per acre, and two are zoned for less than 5. Most jurisdictions, however, are zoned for more than 9 units per acre.

[10]This variation may in part reflect sampling error in small jurisdictions.

Table 3. Zoning and Development Indicators for the Miami–Dade County Study Area

	Total Households (2000)	Change in Households (1990-2000)	Median Value of Specified Owner-Occupied Units ($) (2000)	Change in Median Value of Specified Owner-Occupied Units ($) (1990-2000)	Median Contract Rent for Specified Units ($) (2000)	Change in Median Contract Rent for Specified Units ($) (1990-(2000)	Total Housing Units/Total Households (2000)	Change in Total Housing Units/ Change in Total Households (1990-2000)	Total Multi-family Units/ Total Housing Units (2000)	Change in Total Multi-family Units/ Change in Total Housing Units (1990-2000)	Total Zoned Housing Units/ Total Existing Housing Units	High-Density Zoned Housing Units/ Total Zoned Housing Units	High-Density Acres/ Total Residential Acres	Total Zoned Housing Units/ Total Residential Acres
Aventura	14,000	5,101	225,900	71,000	1,145	311	1.43	1.41	0.92	0.90	1.95	0.99	0.87	43.56
Bal Harbour Village	1,908	–59	664,300	304,600	1,068	87	1.64	–5.97[b]	0.94	1.13	1.33	0.18	0.18	22.29
Coral Gables	16,793	1,333	336,800	113,300	694	218	1.06	0.93	0.37	0.20	3.75	0.54	0.35	10.39
Cutler Ridge	8,396	1,086	113,100	31,200	551	20	1.03	0.97	0.22	0.65	1.53	0.27	0.11	5.43
Doral	7,692	6,365	178,500	56,600	870	–123	1.22	1.21	0.42	0.48	3.62	0.83	0.86	18.53
El Portal	837	–115	99,200	24,600	609	236	1.07	1.35	0.15	–0.25[b]	2.45	0.20	0.11	9.08
Florida City	2,247	465	70,200	17,700	431	148	1.11	0.95	0.44	0.69	3.41	0.68	0.47	8.37
Golden Beach	282	2	739,300	281,000	1,469	468	1.40	46.00	0.00	–0.04[a]	6.83	0.98	1.00	10.13
Hialeah	70,704	11,323	113,900	33,800	537	130	1.02	0.88	0.47	0.43	1.59	0.94	0.89	13.31
Hialeah Gardens	5,636	2,956	113,100	29,800	617	136	1.03	0.99	0.38	0.30	1.33	0.51	0.19	9.17
Homestead	10,095	778	88,200	20,900	444	116	1.10	0.42	0.54	1.10	2.04	0.74	0.63	9.56
Indian Creek	14	–7	1,000,000+	500,000	No rental units	No rental units	2.71	–2.00[b]	0.00	0.00	16.61	1.00	0.99	9.96
Key Biscayne	4,259	428	615,500	303,000	1,609	608	1.50	1.50	0.77	1.22	1.03	0.55	0.26	11.15
Medley	363	59	71,900	21,100	550	263	1.11	0.58	0.15	1.44	7.21	0.89	0.86	9.73
Miami	134,198	3,946	120,100	40,900	473	127	1.11	1.01	0.57	0.41	2.41	1.00	1.00	27.08
Miami Beach	46,194	–3,111	334,400	143,100	581	202	1.29	0.85[c]	0.89	0.46[c]	0.74	0.88	0.68	15.55
Miami Lakes	8,248	2,767	169,600	30,300	806	221	1.09	1.07	0.35	0.12	2.85	0.74	0.39	11.76
Miami Shores	3,631	–36	162,900	58,000	679	189	1.07	0.75[c]	0.12	0.48	0.64	0.07	0.01	3.37
Miami Springs	5,090	–4	154,400	50,700	547	124	1.04	12.00[c]	0.28	4.71	2.62	0.67	0.54	10.29

Table 3. Zoning and Development Indicators for the Miami–Dade County Study Area *Continued*

	Total Household (2000)	Change in Households (1990-2000)	Median Value of Specified Owner-Occupied Units ($) (2000)	Change in Median Value of Specified Owner-Occupied Units ($) (1990-2000)	Median Contract Rent for Specified Units ($) (2000)	Change in Median Contract Rent for Specified Units ($) (1990-(2000)	Total Housing Units/Total Households (2000)	Change in Total Housing Units/ Change in Total Households (1990-2000)	Total Multi-family Units/ Total Housing Units (2000)	Change in Total Multi-family Units/ Change in Total Housing Units (1990-2000)	Total Zoned Housing Units/ Total Existing Housing Units	High-Density Zoned Housing Units/ Total Zoned Housing Units	High-Density Acres/ Total Residential Acres	Total Zoned Housing Units/ Total Residential Acres
North Bay Village	3,132	378	188,300	64,000	776	262	1.10	0.13	0.87	1.63	1.53	0.90	0.40	29.45
North Miami	20,541	414	91,400	19,600	547	124	1.08	11.05	0.42	−0.2[a]	1.94	0.53	0.35	10.43
North Miami Beach	13,987	19	93,000	20,300	573	134	1.48	22.37	0.61	−0.05[a]	1.07	0.72	0.50	9.45
Opa–locka	4,890	−65	69,700	19,000	395	94	1.13	3.05[c]	0.55	1.65[c]	1.31	0.82	0.77	9.77
Pinecrest	6,250	No data	393,900	No data	696	No data	1.02	No data	0.17	No data	1.44	0.23	0.03	2.06
South Miami	4,301	172	170,100	63,400	609	188	1.06	1.20	0.31	0.62	1.65	0.29	0.15	6.45
Sunny Isles Beach	8,169	1,328	298,400	149,100	833	242	1.59	2.01	0.95	1.04	2.06	0.63	0.56	49.57
Surfside	2,248	237	202,500	75,600	613	123	1.41	1.41	0.60	0.97	1.01	0.16	0.14	10.06
Sweetwater	4,267	284	108,800	28,800	581	120	1.02	0.69	0.36	0.91	1.44	0.99	0.97	14.95
Virginia Gardens	890	17	131,400	45,400	579	153	1.03	0.35	0.45	1.00	1.46	0.55	0.16	9.28
West Miami	2,062	35	138,300	54,300	570	133	1.02	0.83	0.18	1.55	2.01	0.99	0.98	11.33
Total	411,324	36,096	215,762	92,107	705	181	1.15	1.23	0.57	0.47	1.90	0.84	0.61	14.87

[a] These values were formed by ratios in which the numerator was negative.
[b] These values were formed by ratios in which the denominator was negative.
[c] These values were formed by ratios in which the both the numerator and the denominator were negative.

Figure 3. Median Housing Prices in Miami-Date County in 2000

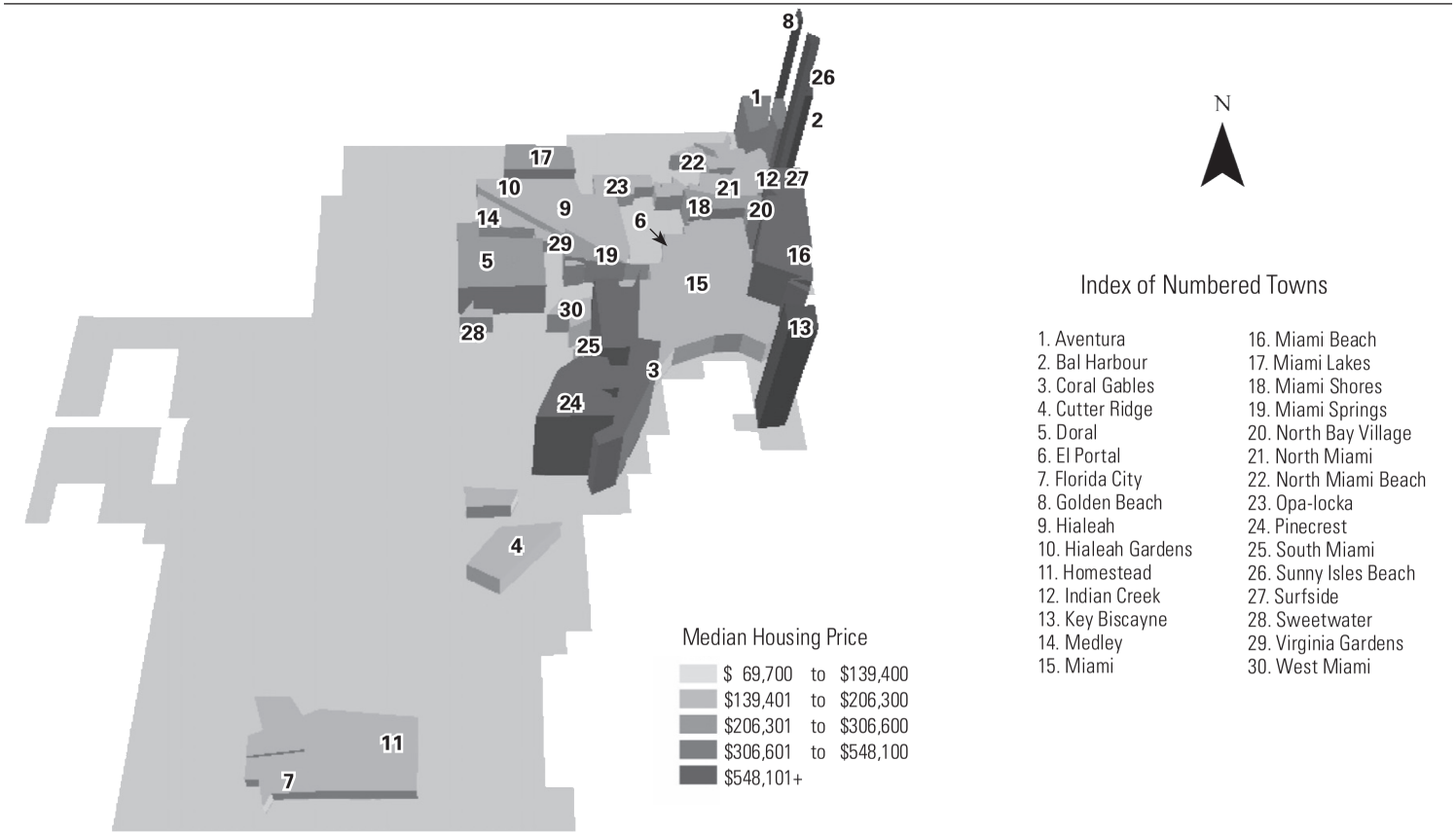


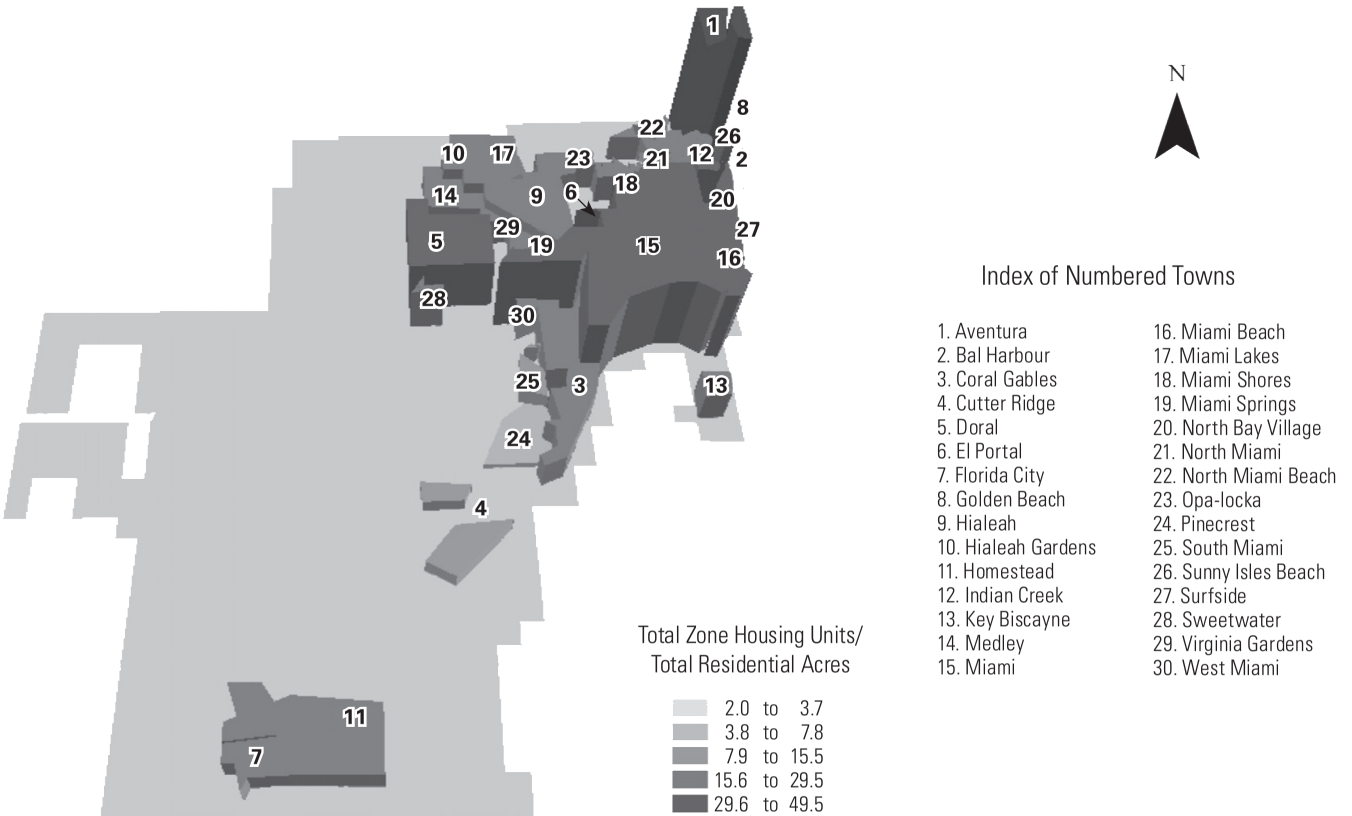
Figure 4 illustrates zoning patterns in the Miami–Dade County study area. Overall zoned densities tend to fall with distance from the ocean, but with notable exceptions. Several shoreline communities have low overall zoned densities. And as shown in figures 3 and 4, many of these low-density communities have some of the highest housing prices and rents. Zoned densities in suburban Coral Gables and Pinecrest are also low, given the high prices in these communities.

Summary assessment

Though Miami–Dade County has high housing prices, housing production is strong relative to household growth, and the share of multifamily housing remains fairly high. Zoning in the area appears to be less of a barrier to high-density, multifamily housing than it is in Boston. For the entire study area, the high-density share of zoned housing units, the share of land zoned for high-density use, and aggregate zoned density are the highest of the three study areas. But zoning patterns and housing prices vary widely. Jurisdictions along the coast have some of the highest prices in the region, but not the highest zoned densities. Further, Coral Gables and Pinecrest, located on the southern edge of the city of Miami, have very high housing prices and very low zoned densities. An examination of the zoning ordinances in these communities suggests that this is not unintentional. None has significant amounts of land zoned for multifamily use by right. In the past, the demand for higher-density housing in this part of the metropolitan area may have been weak; now, however, it seems quite likely that zoning limits the construction of high-density housing.

Zoning in Miami–Dade County often changes when land is developed and annexed to a city. In the past, this reduced the influence of zoning at the urban-rural fringe. As Dade County has tightened its regulatory controls and maintained its longstanding urban development boundary, zoning has grown in significance, especially in constraining the overall supply of developable land (Morgan 2006). Still, from a metropolitan perspective, overall densities are high, and, with exceptions, densities are high where prices are high. The region thus offers evidence that zoning often follows the market and that a high share of multifamily housing is no guarantee of affordability.

Figure 4. Zoned Residential Densities in Miami-Date County



Submetropolitan results: Portland

The Portland study area includes every municipality in Washington, Multnomah, and Clackamas Counties within Portland's urban growth boundary (UGB) but excludes the unincorporated portions of the counties. Jurisdictions vary greatly in size and include a few that are exceedingly small.

Regulatory context

Oregon's planning program has been in place for more than 30 years. Development is regulated at the state level and is coordinated by the Department of Land Conservation and Development (DLCD), a state agency. DLCD prepares the goals and guidelines for local governments to follow as they undertake planning. These goals cover a variety of topics, including citizen participation, urbanization, forestry, housing, recreation, and agriculture.

Each county and city in Oregon must develop, adopt, and amend a comprehensive plan that complies with state land use goals. The UGB, intended to identify and separate urbanizable land from rural land and to ensure compact development, is a critical component of the land use planning system. DLCD's urbanization goal requires all Oregon cities to define, adopt, and plan urban development within UGBs (Oregon Administrative Rules [OAR] 660–015–0000[14]).

Metro, a regional planning agency with a directly elected council, oversees regional land use issues in the Portland area. Key to the purposes of this study is the Metropolitan Housing Rule for the Portland Region (OAR 660–007), which requires cities and counties within the UGB to meet regional standards for density and housing mix. Jurisdictions other than small developed cities must either designate sufficient buildable land to facilitate at least a 50 percent multifamily share of new residential units or justify an alternative percentage based on changing circumstances (OAR 660–007–0030 through 660–007–0037; OAR 660–007–0045). The Metropolitan Housing Rule also requires cities to develop to overall target densities of 6, 8, or 10 units per acre depending on the size of the jurisdiction.

Indicator analysis

Because jurisdictions in the Portland study area vary widely in size, small sample measurement error is possible in the census data for very small jurisdictions. The GIS data obtained from Portland Metro are perhaps the best available on zoning, planned designation, and existing development patterns for any metropolitan area in the country. Although generalized into regional categories, Metro's zoning data are highly detailed and precise.

Housing prices and rents. As shown in table 4, area housing prices in 2000 were the lowest of the three study areas but increased the most from 1990 to 2000. Excluding Johnson City (ostensibly a mobile home park), median prices ranged from just under $130,000 to just over $300,000. Rents in 2000 ranged from about $500 to $1,000 per month. Figure 5 highlights the spatial pattern of housing prices. As shown, most jurisdictions with high housing prices are located in the southeastern suburbs of the metropolitan area.

Housing production and mix. Almost all jurisdictions in the study area gained housing units between 1990 and 2000; most added more units than households. A few, however, lost multifamily housing stock over the period. Further, most communities gained multifamily units, and for most, the multifamily share was more than 25 percent.

Zoned density and mix. As was true in other study areas, most of the land is zoned for single-family residential use. Several jurisdictions have less than 10 percent of residential land and less than 5 percent of units zoned for high-density use. Because zoned densities in high-density zones are relatively high, however, every other jurisdiction has nearly 30 percent or more of all units zoned for high-density use. The average for the study area is 48 percent.

Total zoned residential density varies from 2.5 units per acre in Happy Valley to 19.9 units per acre in Johnson City. Besides Happy Valley, however, only Durham and Rivergrove are zoned for less than 5 units per acre. The average for the Portland study area is just over 10 units per acre—the highest of the three study areas.

Figure 6 depicts the spatial pattern of zoning in Portland. As shown, overall zoned densities are relatively and almost uniformly high. Jurisdictions with the lowest zoned densities are in the southeast quadrant of the metropolitan area. Happy Valley stands out in this regard. Comparing figures 5 and 6 offers additional insights. Housing prices are highest in the southeast quadrant. Lake Oswego and West Linn have high prices and low zoned densities, although both have areas zoned for high-density use. Happy Valley has the highest prices, the lowest overall zoned density, and no land zoned for high-density use.

Summary assessment

The Portland study area grew rapidly from 1990 to 2000; with that growth has come relatively rapid increases in housing prices and rents, as well as increased density in many of the jurisdictions (Downs 2002). Planning and

Table 4. Zoning and Development Indicators for the Portland Study Area

	Total Households (2000)	Change in Households (1990-2000)	Median Value of Specified Owner-Occupied Units ($) (2000)	Change in Median Value of Specified Owner-Occupied Units ($) (1990-2000)	Median Contract Rent for Specified Units ($) (2000)	Change in Median Contract Rent for Specified Units ($) (1990-(2000)	Total Housing Units/Total Households (2000)	Change in Total Housing Units/ Change in Total Households (1990-2000)	Total Multi-family Units/ Total Housing Units (2000)	Change in Total Multi-family Units/ Change in Total Housing Units (1990-2000)	Total Zoned Housing Units/ Total Existing Housing Units	High-Density Zoned Housing Units/ Total Zoned Housing Units	High-Density Acres/ Total Residential Acres	Total Zoned Housing Units/ Total Residential Acres
Beaverton	30,821	8,721	189,800	100,000	643	188	1.05	0.97	0.49	0.45	2.66	0.55	0.40	12.71
Cornelius	2,880	791	139,400	81,100	579	202	1.04	1.10	0.17	0.02	3.04	0.42	0.25	11.90
Durham	528	269	248,300	114,100	644	261	1.05	1.06	0.40	0.71	1.05	0.39	0.09	4.51
Fairview	2,831	1,938	184,900	123,600	648	319	1.11	1.15	0.34	0.39	2.48	0.46	0.26	10.94
Forest Grove	6,336	1,390	155,100	89,100	563	234	1.05	1.13	0.34	0.27	2.56	0.53	0.25	9.55
Gladstone	4,246	573	167,300	93,200	614	232	1.02	1.04	0.25	0.74	2.11	0.62	0.32	10.75
Gresham	33,327	7,622	159,700	88,600	600	214	1.06	1.09	0.40	0.58	2.74	0.36	0.18	10.12
Happy Valley	1,431	931	306,600	185,000	534	142	1.11	1.15	0.00	–0.009[a]	3.46	0.01	0.00	2.47
Hillsboro	25,079	12,230	165,200	93,300	702	305	1.08	1.13	0.39	0.54	2.78	0.37	0.21	11.60
Johnson City	275	6	63,300	5,800	445	253	1.07	3.33	0.02	0.30	1.70	1.00	1.00	19.94
King City	1,389	–16	130,100	55,200	689	175	1.07	–1.69[b]	0.35	0.67	1.22	0.73	0.26	7.21
Lake Oswego	14,769	2,282	296,200	153,600	773	200	1.06	1.12	0.28	0.25	2.39	0.45	0.19	7.52
Maywood Park	306	5	175,600	102,800	617	204	1.06	3.80	0.02	–0.16[a]	1.21	0.03	0.01	6.11
Milwaukie	8,561	661	154,800	89,200	582	202	1.06	1.33	0.31	0.33	1.86	0.53	0.27	9.11
Oregon City	9,471	3,992	164,400	103,200	621	253	1.07	1.12	0.32	0.35	2.57	0.41	0.18	6.95
Portland	223,737	36,469	154,900	95,700	562	222	1.06	1.07	0.35	0.42	1.81	0.47	0.21	11.04
Rivergrove	117	4	232,500	141,700	1,089	576	1.03	1.50	0.00	0.00	3.98	0.04	0.01	3.65

Table 4. Zoning and Development Indicators for the Portland Study Area *Continued*

	Total Households (2000)	Change in Households (1990-2000)	Median Value of Specified Owner-Occupied Units ($) (2000)	Change in Median Value of Specified Owner-Occupied Units ($) (1990-2000)	Median Contract Rent for Specified Units ($) (2000)	Change in Median Contract Rent for Specified Units ($) (1990-2000)	Total Housing Units/Total Households (2000)	Change in Total Housing Units/ Change in Total Households (1990-2000)	Total Multi-family Units/ Total Housing Units (2000)	Change in Total Multi-family Units/ Change in Total Housing Units (1990-2000)	Total Zoned Housing Units/ Total Existing Housing Units	High-Density Zoned Housing Units/ Total Zoned Housing Units	High-Density Acres/ Total Residential Acres	Total Zoned Housing Units/ Total Residential Acres
Sherwood	4,253	3,055	187,500	121,600	652	307	1.05	1.05	0.17	0.13	2.64	0.70	0.39	8.53
Tigard	16,507	4,452	188,600	98,200	613	185	1.05	1.08	0.38	0.40	2.86	0.60	0.34	11.19
Troutdale	4,671	2,228	165,900	95,400	671	211	1.04	1.06	0.18	0.27	1.99	0.60	0.19	6.49
Tualatin	8,651	2,948	197,700	102,100	703	230	1.07	1.10	0.42	0.46	1.29	0.47	0.14	5.70
West Linn	8,161	2,341	246,500	144,000	724	302	1.07	1.19	0.18	0.27	2.19	0.29	0.10	5.51
Wilsonville	5,937	2,829	227,900	106,500	671	223	1.08	1.09	0.46	0.56	3.57	0.94	0.57	12.09
Wood Village	1,014	−62	128,800	74,000	605	199	1.04	1.10[c]	0.21	0.60[c]	4.00	0.52	0.35	13.51
Total	415,298	95,659	184,625	102,375	648	243	1.06	1.08	0.36	0.42	2.16	0.48	0.23	10.07

[a] These values were formed by ratios in which the numerator was negative.
[b] These values were formed by ratios in which the denominator was negative.
[c] These values were formed by ratios in which the both the numerator and the denominator were negative.

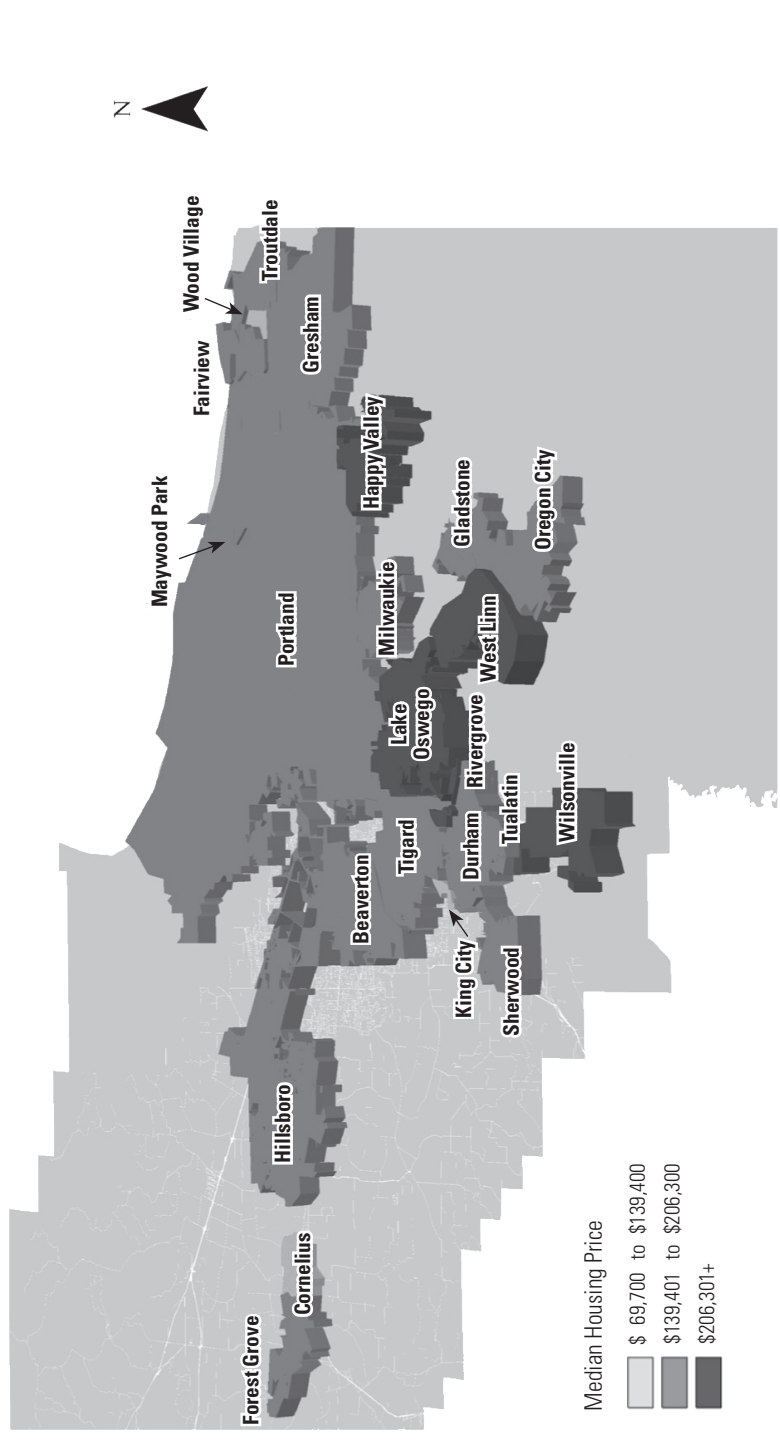
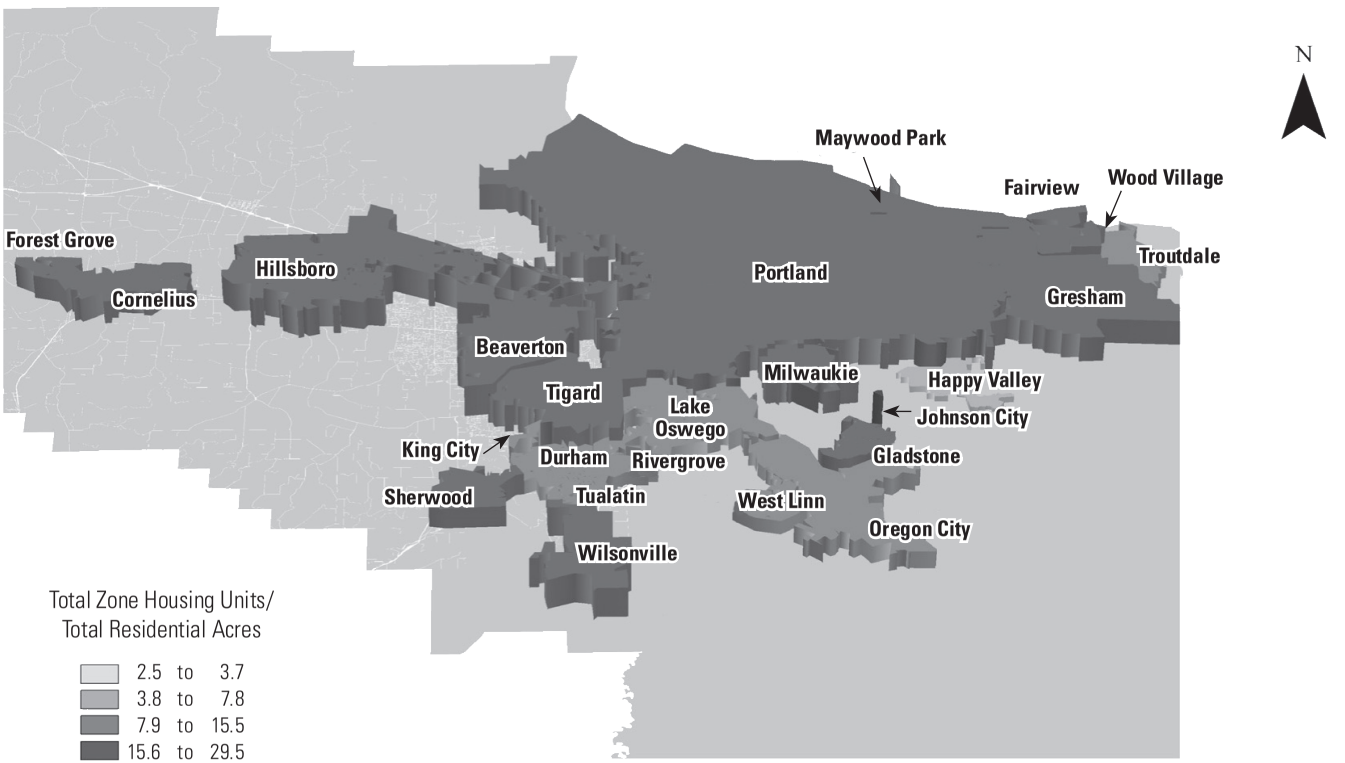


Figure 5. Median Housing Prices in Portland in 2000

Figure 6. Zoned Residential Densities in Portland



zoning are closely monitored at the state and regional levels. All local governments must enact and enforce zoning codes that comply with both regional and state requirements These include density and housing mix targets that encourage the development of multifamily housing. Metro requires that zoning in urbanized areas facilitate a 50 percent multifamily share.

As is true in the other study areas, there is variation among jurisdictions in the amount of land zoned for high-density use. On the whole, however, most jurisdictions have zoning codes that accommodate high-density development, and multifamily housing shares in recent years appear to be high as a result.

Housing prices also vary by jurisdiction, but with some exceptions, the jurisdictions with the highest median home values also have some of the lowest percentages of multifamily units. Happy Valley, Lake Oswego, and Durham fall into this category, with home prices well above the median for the study area, very few multifamily units, and a relatively low percentage of land zoned for multifamily development.

In summary, Oregon's state policy framework makes it more difficult for jurisdictions to use zoning to limit multifamily development and zoning in Portland. Local jurisdictions must plan to meet minimum density requirements, and local zoning must be consistent with local plans. Despite, or perhaps because of, the UGB, zoning does more to encourage the development of multifamily housing in Portland than in any of the other three study areas.[11]

Evidence on key research questions

Our objectives for this study were to characterize the regulatory environment in three metropolitan areas; to characterize visually and quantitatively the pattern of residential zoning in each area; to consider whether zoning represents a barrier to high-density, multifamily housing; and to assess whether detailed zoning data at the jurisdictional level can be used to assess and perhaps mitigate barriers to affordable housing. We believe we have succeeded in meeting each of these objectives with varying degrees of success.

A careful, detailed review of state and regional statutes and ordinances in each of the four study areas and of comprehensive plans and zoning regulations in selected jurisdictions in each study area leads us to conclusions

[11]While the Metropolitan Housing Rule and other affirmative housing policies have succeeded in removing regulatory barriers to high-density and multifamily development in Portland, the system remains imperfect. Some communities, like Happy Valley, meet the minimum conditions of the rule, but in other ways still make high-density housing development difficult.

similar to those reached by Pendall (2000). Regulatory environments vary dramatically in different regions of the nation. But while surveys of regulatory environments, such as Pendall's (2000), provide general impressions of regulatory tools, it is impossible to obtain a thorough understanding of local regulatory environments without extensive analysis of state and local regulations and codes.

In Boston, local jurisdictions are small and exercise land use authority with little state or regional oversight. A recently enacted state law, Chapter 40R, provides some incentive for local governments to allow affordable housing, but the incentive appears to be too small to overcome strong fiscal pressures to exclude it. As a result, many jurisdictions have no land zoned for multifamily or high-density housing, and local zoning regulations are explicitly unaccommodating (Glaeser, Schuetz, and Ward 2006; Krefetz 2001). In Boston, therefore, there appears to be ample evidence that zoning represents a barrier to multifamily housing development in much of the metropolitan area.

In Miami–Dade County, jurisdictions vary in size and experience different rates of growth. Planning occurs in a hierarchical system, but local governments retain a great deal of discretion. Because the strong demand for second homes and condominiums has favorable fiscal impacts, the comprehensive plans and zoning regulations of most jurisdictions are friendly toward high-density, multifamily development. Although multifamily development may be strong, its strength has not ensured affordability. In this study area, zoning appears to be a barrier to multifamily development in only a few select jurisdictions. The results thus make it clear that if the concern is affordability—especially in high-cost, high-amenity locations—simply promoting high-density development will not get to the root of the problem.

In Portland, local planning and zoning are closely monitored by state and regional governments, and zoning must meet minimum density targets and explicit multifamily shares. The result is a higher level of zoned densities at the metropolitan level, an even distribution of multifamily zoning, and high rates of multifamily development. Recalcitrant local governments remain, but there is clear evidence that progress has been made in mitigating regulatory barriers to multifamily, high-density development (Knaap 1990).

Conclusions

Quantitative and qualitative analyses of the three study areas offer clear and compelling evidence that zoning can serve as a barrier to high-density, multifamily housing. Zoning presents a significant barrier in much of the

Boston metropolitan area. And visual display of zoning patterns in all three study areas reveals distinct corridors of jurisdictions that have high and rising housing prices and rents, low shares and rates of growth of multifamily housing, and little or no land zoned for multifamily use. Although the evidence is circumstantial, it is quite compelling. By means of a variety of indicators, digital maps, and local codes and regulations, it is indeed possible to identify barriers to affordable housing. That said, it is also clear that zoning does not always represent a barrier to multifamily housing or that high-density housing is always affordable. In every study area, there are jurisdictions with low densities and low housing prices and jurisdictions with high densities and high housing prices.

How to identify barriers to high-density, multifamily housing and how to remove them, discourage them, or mitigate their impact is the central policy question. There are, of course, a number of options. One is to provide incentives—or to remove disincentives—to zone for higher densities and multifamily housing. This is the essence of Chapter 40R, and it remains to be seen whether this approach can work. A second involves greater regional oversight and the stipulation of density minimums. This is the essence of the Portland approach, and it appears to be having some degree of success. A third approach is to allow developers to "bypass local land-use regulations whenever a locality failed to meet a set of targets based on price, density or new permits" (Glaeser, Schuetz, and Ward 2006). Although this has yet to be tried, our analysis suggests that it is indeed feasible.

Even without extensive review of local zoning ordinances, our analysis indicates that valuable insights can be obtained from a close examination of indicators computed using census and metropolitan GIS zoning data. A detailed analysis of development capacity or the identification of zoning constraints on particular parcels is difficult and beyond the scope of our work. But tabular and visual display of housing stocks, production, prices and rents, and even coarse measures of zoned acres, units, and densities, provides valuable insights that statistical analyses alone cannot reveal. The data can also identify jurisdictions that stand out in terms of housing prices, production of multifamily housing, and zoned densities. A visual display of these data is particularly effective for such identification.

However, our analysis also suggests that the relationship among zoning, housing production, density, and affordability is much more complex than most econometric studies would suggest. Housing market fundamentals and regulatory environments vary widely by metropolitan area. Even if it were possible to offer national zoning standards, those appropriate for Boston could well be highly inappropriate for Portland, Miami–Dade County, or

any other metropolitan area. Any successful anti–exclusionary zoning standards must certainly be regionally specific and based on sound, in-depth, and continuous analysis of local land use regulations and housing performance measures.

HUD is considering whether to launch a database derived from a periodic national survey of local land use regulations. Such a database could be used to provide further statistical evidence that land use regulations, and zoning in particular, can have adverse effects. But it is doubtful that such a survey can provide information directly useful for influencing local land use policy.

Addressing exclusionary zoning will at some point require specific information on the zoning practices of particular jurisdictions. Although federally supported metropolitan planning organizations (MPOs) now exist in nearly every metropolitan area in the country, very few currently maintain information on zoning or land use regulations—even though it would facilitate their core function of transportation planning (Knaap and Nedovic-Budic 2004). Supporting MPOs to collect and report information on land use regulations is an unobtrusive first step in understanding and perhaps addressing the problem without establishing the oversight role of Portland's Metro or the Metropolitan Council of Minneapolis–St. Paul. To the extent that we are truly interested in addressing regulatory barriers to affordable housing, we should support MPOs in enabling policy makers to first recognize regulatory barriers where they exist.

Appendix A

Zoning computation and caveats

Computation. The data sources for the GIS analysis are listed in table A.1. The following steps were taken to generate indicators of zoning constraints:

1. From GIS metadata and local zoning ordinances, zoning codes were classified as single-family, multifamily, mixed use, commercial, industrial, and public use/open space. Categorization was necessary to allow for comparison across study areas.
2. From GIS metadata and local zoning ordinances, the maximum allowed residential density was calculated. The highest allowed density was used; for example, if zoning allowed 1.0 to 5.0 dwelling units per acre, 5.0 was assumed to be the maximum residential density.

3. Total residential acreage was calculated for each jurisdiction by adding all residentially zoned areas, except for agricultural residential areas. Mixed use is included.
4. The total number of housing units that would be allowed based on the zoning was calculated to show the ceiling or maximum number of units a particular zone could accommodate.
5. Residential zones were classified by allowed maximum density. The categories comprised (1) very low density (no more than one unit per acre), (2) low density (more than one but less than eight units per acre), (3) high density (eight or more units per acre), (4) mixed use, and (5) agricultural use. This process allowed for a standard comparison across jurisdictions. Density classes were computed without regard to designated use. That is, most multifamily designations allowed densities that fell into the high-density category; some single-family uses, however, also fell into the high-density category.

Caveats. Because the GIS data were collected from a variety of sources, the quality and character vary widely across—and in most cases within—the study areas. Thus, we had to develop standard definitions and classifications to facilitate intra- and interregional comparisons for each study area. Some of the larger data-related issues include the following:

1. For Portland, we were able to obtain parcel polygon data; parcel polygons were not available in Miami–Dade County and Boston.
2. For Portland, we were able to obtain a vacant land layer; for all of the other jurisdictions, a reliable vacant land layer was not available.

Table A.1. Sources of GIS Data

	Layer	Description	Source	Date
Boston	Zoning	Statewide and generalized zon	MassGIS 2004	2000–2004
Miami–Dade County	Zoning	Countywide local zoning	Miami–Dade County, Department of Planning and Zoning, 2004 (unpublished information provided to the authors)	1995–2003
Portland	Zoning	Portland Metro generalized zoning	Portland Metro Department of Data Services, 2002a, 2002b	2000–2002
	Parcel	Parcel layer		

3. For Boston and Portland, local zoning (or future land use) data were generalized into consistent categories for the entire metropolitan area; for Miami–Dade County, we had to create our own generalized layer.
4. In Miami–Dade County and Portland, the number of jurisdictions with land use authority was relatively small, so every jurisdiction that had it was included in the analysis. In Boston, the number of jurisdictions with land use authority was large, and only those whose population was over 25,000 were included. This had the unfortunate but unavoidable effect of creating spatial discontinuities within these study areas.
5. In every jurisdiction, the data captured the most recent—often the current—zoning regulations. The census data on housing stocks, prices, and incomes come from the 1990 and 2000 decennial censuses (U.S. Bureau of the Census 1992, 2002). Thus, any analysis of the effect of zoning regulations on housing prices, rents, and rates of production requires the strong assumption that existing regulations offer a reasonable depiction of the previous decade and a half.
6. The size of jurisdictions in the respective study areas varied widely. In large jurisdictions with areas designated for both low- and high-density uses, the jurisdiction appeared to have a moderate overall density. However, in small jurisdictions that contained largely low- or high-density uses, overall zoned densities varied more, even if the underlying development pattern was the same.
7. In small jurisdictions, measurement errors can be more pronounced. A sliver in a zoning polygon, for example, can lead to large measurement errors of zoned density in smaller jurisdictions. Large measurement errors in census data on populations, households, and housing units are also common for smaller jurisdictions.

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This work was supported by grants from the U.S. Department of Housing and Urban Development, the Lincoln Institute of Land Policy, and the Fannie Mae Foundation. The views expressed in this article are those of the authors and do not necessarily represent those of the institutions and businesses at which they are employed.

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