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Is Smart Growth Fair Growth: Do Urban Growth Boundaries Keep Out Racial Minorities?

Elizabeth P. Ruddiman
None, bruddiman@earthlink.net

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Introduction

As many American metropolitan areas are continually spreading outward, urban planners, elected officials, environmentalists, and sociologists are interested in the effects sprawl is having on our built environment, our natural environment, and our society. This study poses the question: "Is there a relationship between smart growth initiatives and racial housing patterns?" More specifically, I focus on the effect of a widely used smart growth policy—the urban growth boundary (UGB)—and investigate whether or not the presence of an UGB hinders the entry of blacks and Hispanics into cities and affects their level of residential segregation in cities.

An urban growth boundary delineates and separates the area in which development (e.g., construction of new housing, shopping centers, etc.) is encouraged or permitted and outside of which development is discouraged or prohibited. As Pendall et al. (2002: 39) note, however, "little work has examined the interrelationship of urban containment policies and race and class issues in metropolitan areas." This study identifies trends between 1990 and 2000 and compares places with and without urban growth boundaries.

The focus of this study, the urban growth boundary, is "a line around an urban area within which development is encouraged—often with density bonuses or minimum density requirements—to accommodate projected growth over a specified future time period, typically ten to 20 years" (Nelson 2000: 45). Land outside the urban growth boundary is restricted to low density uses, such as agriculture, green space, and/or small amounts of low density housing. The two purposes of urban growth boundaries are: (1) limiting urban sprawl by promoting compact and accessible development with efficient public services, and (2) preserving open space, agricultural, and environmentally sensitive areas.

Contributions of this Study

This study contributes to the understanding of the two-way relationship between society and land use policies. More specifically, it looks at whether a particular type of smart growth initiative, the urban growth boundary, influences racial housing patterns. This inquiry is important because these boundaries are a relatively new land use technique and are being increasingly employed (Porter 1997). Harden (2006) reports a decline in the black population in two cities with UGBs (Portland, OR and Seattle, WA), as they are being "priced out" of certain neighborhoods, though it is not clear whether this is leading to increased or decreased residential segregation (Harden 2006). As a result, the debate over the effects of urban growth boundaries on housing costs and, ultimately, on who can afford to live within the UGBs merits attention from urban planners and urban sociologists.

Literature Review

Smart Growth and Housing Affordability: Three Perspectives

Smart growth and reduced housing affordability. In the debate over smart growth's effect on housing affordability, the most frequently taken position is that smart growth decreases affordability. The argument is that a smart growth policy such as the UGB reduces the supply of developable land, and this limiting of supply causes the price of developable land to increase, which in turn causes housing costs to rise. Examples of areas where some researchers feel smart growth has contributed to rising housing costs include Portland, Oregon (Lorentz and Shaw 2000), Laguna West, California (Gordon and Richardson 1997), San Francisco, California (Katz and Rosen 1987), and Kentlands, Maryland (Gordon and Richardson 1997).

Smart growth and increased housing affordability. A second perspective on the relationship between smart growth and housing affordability is that smart growth practices can expand the stock of affordable homes. Bullard, Johnson, and Torres (2003) suggest that infill housing developed in central city neighborhoods can be affordable. To clarify, infill housing development can be defined as "new residential development on vacant, abandoned, and underutilized property within built-up areas of existing communities, where infrastructure is already in place" (Felt 2007: 2). Bullard, Johnson and Torres argue that such infill homes can be built economically because the necessary infrastructure (e.g., streets, sewer lines, and electric service) are already present. Also, smart growth utilizes higher residential densities and smaller lot sizes so housing units are smaller than traditional suburban homes, which might reduce costs. Moreover, to the extent that smart growth reduces households' need to use or own automobiles it reduces transportation costs, and by redirecting some of the savings (less money spent on gasoline, car payments or insurance) housing costs can be made a more affordable item in the household budget.

No relationship between smart growth and housing affordability. The third position on whether, or how, implementing smart growth principles affects housing affordability is that it depends on several other situational factors. Nelson et al. (2002), Downs (2002), Marshall (2000), and Porter (1992) contend that factors such as demand for housing, location, size, and local economic conditions affect housing costs so strongly that it is difficult to determine whether a smart growth policy has a significant effect. In addition, Pendall (1995, 2000) argues that only certain types of land use regulation influence the cost of housing, and he finds no relationship specifically between urban growth boundaries and housing affordability.

Urban Growth Boundaries and Racial Housing Patterns

Studies by Pendall (1995, 2000), Pozdena (2002), Nelson et al. (2004), and Nelson (2004) examine the relationship between smart growth policies such as UGBs and racial housing patterns. In theory, the link between UGBs and racial housing patterns is economic: if UGBs bring about substantially higher housing costs in a city, then a significant percentage of blacks and Latinos might be "priced out" of the area because their lower incomes make them less able to afford housing in cities with UGBs than the more affluent whites. However, in his study of five forms of growth regulation, Pendall (1995) found that urban growth boundaries had no effect on racial composition of cities with UGBs.

On the other hand, Pozdena (2002) contends that if the growth restriction policies implemented in Portland, Oregon (especially a UGB) had been carried out in the nation's 77 largest metropolitan areas between 1987 and 1997, many urban families who currently own homes could not have afforded them due to increased housing prices. Pozdena's reasoning is that in cities with restrictions on real estate development, the pressure of population growth on the remaining developable land causes housing prices to rise substantially, which lowers homeownership rates among racial minorities. His calculations suggest that nationally over one million households, including 260,000 minority families, would be unable to buy a home. Pozdena concludes that, "Restricted growth policies, therefore, can fairly be dubbed 'the new segregation', as they deter African-Americans and other minorities from the housing market at disproportionate rates" (Pozdena 2002, p. v).

The price of housing in places with UGBs might affect the number of racial minority households moving into the area (or how many move away due to rising housing costs). However, some researchers also examine UGBs and racial residential segregation (i.e., differences in the groups' spatial distribution across a place's subareas). In theory, the presence of a UGB might contribute to lower levels of residential segregation since it blocks or limits the development of distant suburbs, which in metropolitan areas lacking UGBs have often become overwhelmingly white communities. In other words, by limiting suburban sprawl, UGBs could make it more difficult for whites to find spatial areas in which they can avoid living close to racial minorities, since whites object to minorities when they are about a third or more of the neighbors (Bobo and Zubrinsky 1996). Of course, this assumes that fair housing laws are respected or enforced and also that UGBs do not have the effect of raising housing costs high enough to permit only a small fraction of the racial minority population to be able to afford to live in neighborhoods within a city bounded by an UGB.

Nelson et al. (2004) studied change in residential segregation from 1990 to 2000 in 101 metropolitan areas with an urban growth boundary. Segregation between non-Hispanic whites and African Americans, Hispanics, and Asians was examined. Other characteristics Nelson et al. (2004) looked at were population growth, income, crime level, number of manufacturing jobs, and policies requiring housing for moderate- and low-income households. They found that a strong containment boundary (i.e., a UGB with severe restrictions on development outside it) decreases the level of segregation between African Americans and whites, and has no effect on the segregation of the Hispanics or Asians.

In a later study, Nelson (2004) linked UGBs with reduced racial residential segregation. He looked at four metropolitan areas, two that are bounded by a UGB (Portland, OR and Sacramento, CA) and two that are unbounded (Charlotte, NC and Bakersfield, CA). For all four metro areas, the level of black/white segregation declined between 1990 and 2000. However, the places with UGBs experienced an average reduction of 14.83 percent, while the places without UGBs experienced an average reduction of only 6.06 percent. Nelson suggests, therefore, that urban growth boundaries facilitate black/white desegregation.

Methodology

Sample and Data Sources

The statistical analysis for this study is based on 43 matched pairs of cities – 86 cities, 43 of which have UGBs and 43 of which do not. To obtain the matched pairs I started with Pendall's (1995) list of 197 jurisdictions with UGBs as identified by his 1994 survey. From Pendall's list, 43 jurisdictions meet the following criteria for inclusion in the sample: (1) being listed as a city or town by the Census Bureau in both 1990 and 2000, (2) having a UGB that was established between 1980 and 1990, (3) having its index of dissimilarity listed on the Lewis Mumford Center's segregation index website, and (4) not being located in Oregon or Washington (since both states require all urban areas to establish urban growth boundaries and, as a result, there are no nearby comparable jurisdictions without UGBs).

Next, a comparable city or town was identified for each of the 43 places with a UGB. Two factors were initially considered: location and 1990 total population. Using a United States road atlas (Rand McNally 2004), each city or town with a UGB was marked with a map flag. Then, for each one, the area was carefully studied for other places that might serve as the comparable place in my analysis. To the extent possible, places were identified in the same metropolitan area, at comparable distance from the metro area's central city, and with similar relation to geographic features that are natural (e.g., rivers and lakes) or manmade (e.g., highways). The 1990 total population size of places was also considered, and I noted places of similar size as the places with UGBs. The place that met these location criteria and had the closest population size was selected. These selected places were then checked for three final criteria: not having a UGB, being listed by the Census Bureau as a city or town, and having its segregation index listed on the Lewis Mumford Center's website. If a selected place did not meet all three of these criteria, it was replaced with the next best comparable place in terms of all these criteria. The list of the 43 matched pairs of places included in this sample is included as an appendix.

Selecting a sample comprised of matched pairs of places that are quite similar in many respects, but differ with regard to having an UGB, is one way to reduce (though not completely eliminate) the influence of other causal variables and highlight impact that urban growth boundaries might have. As noted below, in the final step of the analysis I also use multiple regression to distinguish the possible effect of UGBs from that of other variables.

In addition, I purposely selected for comparison two other cities: Portland, OR (with an UGB) and Atlanta, GA (no UGB). Although these two places clearly are not "comparable" in way that the other 86 are, many researchers and observers have contrasted them because Portland has a reputation as a place that keeps development within a tightly constrained area while, in contrast, Atlanta is widely known for its extreme degree of suburban sprawl (Cox 1999; Miles, Song & Frank 2010; Stanford 2003). In this analysis I only use the Portland-Atlanta contrast heuristically, to suggest what difference an urban growth boundary might make based on the experience of these two prominent places. The actual statistical analysis, however, is based only on the other matched pairs of places, and sometimes the results from the truly comparable places contradict conclusions that might be drawn from a simple Portland-Atlanta comparison.

The data for this study were obtained from four sources: the U.S. Census Bureau website (http://www.census.gov), the 1990 Census of Population - Social and Economic Characteristics (U.S. Census 1993), the Lewis Mumford Center for

Comparative Urban and Regional Research website (http://mumford.cas.albany.edu), and Pendall (1995).

Dependent Variables

The three racial/ethnic groups studied here are non-Hispanic blacks ("blacks"), non-Hispanic whites ("whites"), and Hispanics. The three dependent variables examined in this study are: (1) amount of in-migration to each place between from 1995-2000 for each of the three racial/ethnic groups; (2) percentage change in population size between 1990 and 2000 for each of the three racial/ethnic groups; and (3) change in the level of residential segregation between 1990 and 2000, and the level of residential segregation in 2000, as measured by indices of dissimilarity between whites and blacks and between whites and Hispanics as reported on the Mumford Center for Comparative Urban and Regional Research (State University of New York at Albany) website. The index of dissimilarity is the most widely used indicator of a city's level of segregation. The index ranges from 0 to 100, and high index values indicate greater residential segregation between two groups (i.e., each group's residents are spatially distributed in very different percentages across a city's census tracts). The dissimilarity index can also be interpreted as the percentage of minority residents that would need to move to a different area in order for every neighborhood to replicate the racial composition of the city as a whole. Researchers generally regard a score above 60 as a high level of residential segregation, indexes between 30 and 60 are considered moderate, and dissimilarity indexes below 30 indicate a low level of residential segregation (Massey and Denton 1993).

Independent Variables

A variety of independent variables that may relate to a place's number of racial/ethnic minorities and its level of residential segregation are included in the study. The variables are: (1) whether or not the place has an urban growth boundary; (2) the 1990 black population and 1990 Hispanic population as a percentage of the total 1990 population of each place; (3) the number of households paying 35 percent or more of their income in rent in 2000; (4) the number of housing units built in the 1990s as a percentage of all 2000 housing units; and (5) regional dummy variables to capture any geographic differences in racial housing patterns. These dummy variables are used to code each place's region according to the U.S. Census Bureau's scheme. The reference region is the Midwest.

In a few cases data on one or more variables was not available. In those cases, the place with missing data and its matched place was not included in the statistical analysis. For that reason, the number of cases listed in Tables 1-5 does not always equal 43 pairs.

Analysis

I analyze the data in five ways. The first three analyses are designed to discover whether UGBs have the effect of restraining or reducing the in-movement and/or population increase of blacks or Hispanics. My first, and most direct, test of this involves a statistical analysis that compares places with and without UGBs in terms of how much recent (1995 to 2000) in-migration of blacks, Hispanics, and whites they have experienced. If UGBs hinder the arrival of racial minorities, then the average in-flow of whites should exceed that of blacks and Hispanics in the places with UGBs by significantly more than is the case in the paired places without UGBs. In this test I use a relative measure of in-migration between 1995 and 2000: number of in-movers of each race as a percentage of each group's 2000 population size (i.e., percentage of each race's total population that has recently moved in). I use a difference of means test to see whether, on average, places with UGBs have significantly lower levels of black and Hispanic in-migration than do places without UGBs (and show no difference on white in-movement level).

My second analysis also tests whether there is a significant difference between places with and without UGBs in the level of each racial/ethnic group's recent in-migration, but in a different way. The number of black, white, and Hispanic in-movers (arriving between 1995 and 2000) to each place are expressed as a percentage of each place's total in-movers. This allows me to see whether or not, as a percentage of the total stream of in-movers to an area, blacks and Hispanics form a smaller percentage in places with UGBs than in the matched places without UGBs (and to see if the same outcome holds for whites).

Since black, white, and Hispanic in-migration to a place is influenced by the size of its pre-existing same-race population, my third analysis takes this into account. Each racial/ethnic group's population change between 1995 and 2000 is expressed as a percentage of the group's 1990 population. This population change reflects both net migration (i.e., difference between in-migration and out-migration) and net natural change (i.e., difference between numbers of births and deaths). Here the statistical test shows whether, controlling for the places' initial size of its black, white, and Hispanic populations, there are significant differences in the growth of the racial/ethnic groups in the paired cities with and without UGBs.

The remaining two analyses deal with changes in each place's 1990 and/or 2000 level of residential racial segregation. First, I use difference of means tests to determine whether black-white and Hispanic-white residential segregation is lower in places with UGBs than in places without them and how level of segregation changed between 1990 and 2000. Finally, multiple regression is used to determine if, after controlling for several relevant variables, the presence of an UGB has an effect on the 2000 level of racial residential segregation in a place.

Limitations and Clarifications

As with all studies, this research has some limitations. The first is that the meaning and implementation of an "urban growth boundary" is not uniform throughout the United States, in fact, urban growth boundaries are defined and administered in a variety of ways in different places. Second, although I tried to select cities or towns that were quite similar for each pair of places with and without an UGB, in reality, no two cities or towns are a perfect match. In each place, there are unique factors that may affect the attraction it holds for different racial groups and their levels of residential segregation. Third, it is important to note that places with urban growth boundaries are small or medium size cities and towns that have relatively low percentages of racial minorities. More specifically, in 2000, 93 percent of the places with boundaries had black sub-populations of ten percent or less and 59 percent of these places had Hispanic sub-populations of ten percent or less. Also, their levels of racial segregation (as measured by the dissimilarity index) are moderate to low (the same holds for the comparable places they are paired with in my sample). This means we must be careful about generalizing the conclusions of this research. My results are most likely to hold true for places that are similar to those in this sample; I make no claim that if very large, highly segregated major metropolitan areas (e.g., Chicago, Detroit) adopted UGBs similar results would be observed. Finally, it is important to keep in mind that, regarding smart growth policies, this research looks at only the urban growth boundary. The UGB is just one smart growth technique among an array of techniques. Some cities and towns that are concerned about sprawl implement several smart growth measures, which might include an UGB. The additional effects, if any, of other smart growth practices are not captured by this study. For discussions of how different smart growth policies affect racial housing patterns see Pendall et al. (2005) and Nelson et al. (2004).

Results

In-Migration by Blacks and Hispanics

I begin the analyses by showing how patterns in Portland, OR (probably the most well known place with an UGB) and Atlanta, GA (well known for its sprawl) compare; then I present the findings from the analysis of my matched sample of comparable places with and without UGBs. If a UGB hinders minorities' movement to a city, we would expect to see lower levels of in-migration by blacks and/or Hispanics as compared to whites in places with UGBs.

Racial groups' in-migration in relation to its 2000 size. Comparing 1995-2000 migration to Portland and to Atlanta, recent Hispanic in-movers to Portland represent 38.0% of the 2000 Hispanic population, while in Atlanta they represent 53.7%. Recent black in-movers to Portland represent 16.4% of their 2000 population, while black in-movers to Atlanta represent 19.0% of the 2000 black population. For white in-movers, the pattern is similar: in Portland recent migrants constitute 25.1% of its 2000 white population, while in Atlanta, recent white in-movers comprise 39.3% of its 2000 white population. Thus, the place *with* an UGB (Portland) has relatively less recent in-movement of blacks and Hispanics than does the place *without* an UGB (Atlanta), but the same is true for whites too. Is this true for the other cities and towns in my sample?

Results shown in Table 1 indicate that, in my sample of matched places, the volume of recent in-migration by blacks is not significantly different in places with and without UGBs; moreover, the same is true for Hispanic and white in-movement. Thus, the pattern seen in the Portland-Atlanta comparison is not found in the matched pair sample. For example, in the sample, recent black in-movers constituted, on average, 43.16% of the 2000 black population in places *with* UGBs, and 40.05% in places *without* an UGB (the paired samples t-test shows this small difference is not statistically significant). For Hispanics and whites, the differences between places with and without UGBs in terms of mean levels of recent in-migration are even smaller and also not statistically significant. This step in the analysis implies that new black and Hispanic residents are being drawn equally to places with and without urban growth boundaries, so these boundaries do not appear to be a barrier to their entry.

Table 1. Difference of Means Tests to Compare Matched Places *With* and *Without* Urban Growth Boundaries: Black, Hispanic, and White In-Migration (1995-2000) as a Percentage of Each Group's 2000 Population.

Group & Place Comparison	# of Paired Places	Mean % of In-Migrants	Std. Dev.	Diff. Between Means	Sign. Level (2-tailed test)
Black In-migrants: (as % of place's 2000 total black population)					
to places *With* UGBs	28	43.16	3.34	3.11	.308
to places *Without* UGBs	28	40.05	13.15		
Hispanic In-migrants: (as % of place's 2000 total Hispanic population)					
to places *With* UGBs	37	40.79	11.52	-.94	.610
to places *Without* UGBs	37	41.73	11.36		
White In-migrants: (as % of place's 2000 total white population)					
to places *With* UGBs	43	33.34	7.39	-.48	.673
to places *Without* UGBs	43	33.62	8.01		

Thus, analysis of these data reveals that boundaries do not reduce the racial groups' 1995-2000 in-migration, at least when viewing in-migration as a percentage of these groups' population size in 2000. On this measure, I find no evidence that urban growth boundaries tend to make places less accessible to blacks or Hispanics.

Racial groups' in-migration in relation to total in-migration. If UGBs somehow hinder or discourage racial minorities from moving to or settling in a city or town, then we would expect to find that racial minorities constitute a smaller percentage of the total stream of movers into places with UGBs than they do in places without UGBs. I test this expectation in this step of the analysis. A comparison of Atlanta and Portland seems to bear it out for blacks but not Hispanics. In Atlanta, well known for being a very popular destination for black movers, blacks comprise 41.0% of all people moving there between 1995 and 2000. In contrast, Portland (with an UGB) is not nearly as popular among blacks, as only 4.1% of all people moving to Portland in those years were black. However, for Hispanics, there is little difference between Atlanta and Portland. In Atlanta, 8.5% of all recent in-movers were Hispanic, while 10.0% of Portland's in-movers were Hispanic.

Statistical analysis of the matched pairs of places reveals no significant difference between places with and without UGBs in terms of the percentages of blacks and Hispanics in the streams of people moving to those places (see Table 2). For places that have UGBs, blacks, Hispanics, and whites, respectively, constituted, on average: 7.70%, 15.91%, and 71.05% of all recent in-movers; in places without UGBs the percentages for blacks, Hispanics, and whites are very similar: 10.24%, 14.05%, and 70.54, respectively. The differences between these means are not statistically significant at the .05 level.

So, when considering black and Hispanic in-movers in relation to the total number of in-movers between 1995 and 2000, the data reveal no differences that might be attributable to the urban growth boundary. Thus, the presence of UGBs does not appear to reduce the ability of blacks and Hispanics to move into cities and towns.

Table 2. Difference of Means Tests to Compare Matched Places *With* and *Without* Urban Growth Boundaries: Black, Hispanic, and White In-Migration (1995-2000) as a Percentage of Total In-Migration to Each Place.

Group & Place Comparison	# of Paired Places	Mean % of all In-Migrants	Std. Dev.	Diff, Between Means	Sign. Level (two-tailed test)
Black In-migrants: (as % of place's 2000 total in-migration)					
to places *With* UGBs	28	7.70	12.18	-2.53	.180
to places *Without* UGBs	28	10.24	10.24		
Hispanic In-migrants: (as % of place's 2000 total in-migration)					
to places *With* UGBs	37	15.91	14.74	1.85	.402
to places *Without* UGBs	37	14.05	10.69		
White In-migrants: (as % of place's 2000 total in-migration)					
to places *With* UGBs	43	71.05	20.28	.50	.853
to places *Without* UGBs	43	70.54	20.28		

Conclusions about in-migration. The presence or absence of an urban growth boundary does not affect the racial/ethnic makeup of recent in-movers. This is true whether racial minority in-movers are related to each group's 2000 size or to the total number of in-movers. Although comparing Portland and Atlanta may suggest some support for the idea that a place with an UGB will attract fewer minority movers, statistical analysis of matched places clearly contradicts it and shows no significant differences in minority movement to places with and without UGBs. This implies that differences in minority movement to Atlanta versus Portland are most likely due to factors other than the presence or absence of an urban growth boundary.

Population Changes of Blacks and Hispanics

Looking at population change offers a broader view of the possible impact of urban growth boundaries than does in-migration alone. In addition to in-migration, population change captures out-migration, births, and deaths. Again, if an UGB hinders minorities' population changes, we would expect to see smaller black and Hispanic increases in Portland and other places with UGBs than in Atlanta and other places without UGBs.

Each subpopulation's change in relation to its 1990 size. Looking at Atlanta and Portland, we see somewhat similar population changes in the two cities. Between 1990 and 2000, Atlanta's black population declined slightly, by 3.4% (mainly due to blacks moving to Atlanta suburbs), and Portland's increased slightly, by 4.7%. These two cities experienced more comparable changes in their Hispanic populations. Atlanta's Hispanic population increased by 148.8% between 1990 and 2000, while Portland's Hispanic population increased by 159.9%.

The analysis of matched pairs yields the finding that UGBs do *not* impact minorities' population changes (see Table 3). Since most places in my sample of matched pairs had relatively small minority populations in 1990, even small or moderate population increases produce large percentage changes for the 1990-2000 decade. For blacks, places with an UGB on average saw an increase of about 97% in their black population, while places without an UGB experienced a black population increase of about 111%; however the paired sample difference of means test shows that this difference between places with and without UGBs is not statistically significant at the .05 level ($p = .470$). Similarly for Hispanics, although places with UGBs, on average, grew by about 10 percentage points less than places without UGBs (about 125% vs. 136%), the statistical test indicates that this is not a significant difference ($p = .704$). Thus, the comparison of the sample places in matched pairs shows that an UGB does not influence the minorities' population changes, nor does it affect the size of the white population change.

Table 3. Difference of Means Tests to Compare Matched Places *With* and *Without* Urban Growth Boundaries: Black, Hispanic, and White Percentage Increase in Population (1990-2000).

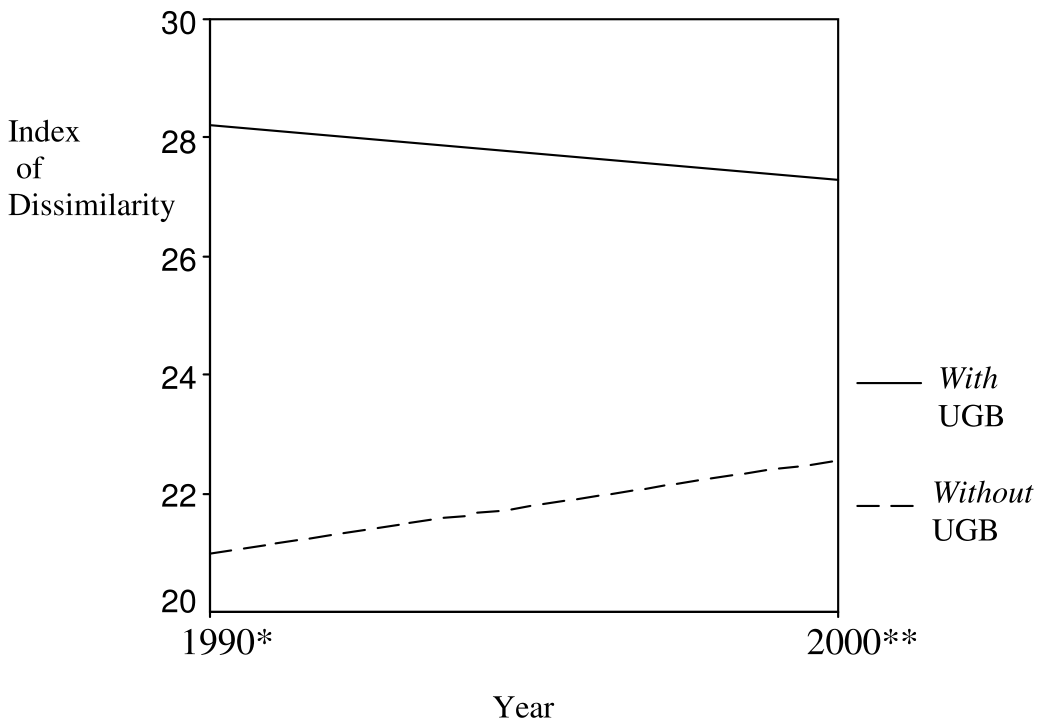
Group & Place Comparison	# of Paired Places	Mean Pop. % Increase	Std. Dev.	Diff. Between Means	Sign. Level (two-tailed test)
Black Population % Increase (1990 to 2000)					
in places *With* UGBs	43	96.66	123.47	-	.470
in places *Without* UGBs	43	110.79	117.51	14.14	
Hispanic Population % Increase (1990 to 2000)					
in places *With* UGBs	43	125.06	177.88	-10.61	.704
in places *Without* UGBs	43	135.66	151.54		
White Population % Increase (1990 to 2000)					
in places *With* UGBs	43	19.26	41.06	4.76	.399
in places *Without* UGBs	43	14.50	34.86		

Level of Racial Residential Segregation

If UGBs affect level of racial residential segregation, we would expect to see differences between places like Portland, with a UGB, and places like Atlanta, without a UGB, in their levels of segregation. Comparing the cities of Atlanta and Portland does reveal a notable difference. Atlanta's black-white index of dissimilarity was very high in 1990 (81.3) and remained very high through 2000 (81.6). On the other hand, Portland's black-white index was considerably lower in 1990 (63.6) and declined into the moderate range by 2000 (51.8). A comparison of Hispanic-white changes is also useful. In Atlanta, Hispanic-white residential segregation was moderate in 1990 (47.9) and it increased (57.8) in 2000. In Portland's Hispanic-white residential segregation was low in 1990 (22.0) and it also increased (to 29.2) in 2000. Both places experienced an increase in the residential segregation of their Hispanic populations, a pattern found in many major U.S. urban areas (Logan, Stults, and Farley 2004). Nonetheless, for both blacks and Hispanics, residential segregation is lower (in both 1990 and 2000) in the city with the UGB (Portland) than in the city without one (Atlanta). We must test to see if this pattern holds up in the matched pairs sample.

For black-white residential segregation, Figure 1 clearly illustrates the mean dissimilarity index values for places with and without UGBs. In contrast to the Portland-Atlanta comparison, in the matched pairs sample, the mean index of dissimilarity for these places (regardless of whether or not they have an UGB) is in the low range, but black-white segregation in 1990 was significantly higher in places with an UGB average (mean dissimilarity index of about 28) than in places without one (mean dissimilarity index about 21). However, as Figure 1 shows, by 2000 some convergence occurred in both kinds of places' mean black-white dissimilarity indexes. In fact, the 2000 difference in average black-white segregation between places with and without UGBs (distance on the y-axis) is not statistically significant (whereas it was in 1990).

Figure 1. Mean Black-White Index of Dissimilarity for Places *With* an Urban Growth Boundary and Places *Without* an Urban Growth Boundary, 1990 and 2000.



* 1990 difference is statistically significant
** 2000 difference is not statistically significant

Table 4 shows the matched pairs analysis of the changes in the indexes of dissimilarity from 1990 to 2000. These results hint at a slight pro-integrative effect of urban growth boundaries for blacks and whites, but this effect is not quite large enough to be statistically significant (p = .113). The data in Table 4 suggest that places with UGBs on average had a decline in black-white dissimilarity index (-1.33), while those without UGBs saw a slight increase (1.40). This implies that places with UGBs experienced more slight declines or smaller increases in black-white segregation between 1990 and 2000 than did places without boundaries, but this difference is too small to be statistically significant. However, the pattern for Hispanic-white residential segregation is different. For places with and without UGBs alike, the mean Hispanic-white dissimilarity index rose by just over 5 points between 1990 and 2000. Thus there is no significant difference between how cities with and without UGBs fared in terms of Hispanic-white residential segregation.

Table 4. Difference of Means Tests to Compare Change in Level of Residential Segregation in Matched Places *With* and *Without* Urban Growth Boundaries: Black-White and Hispanic-White Indexes of Dissimilarity, 1990 to 2000.

Group & Place Comparison	# of Paired Places	Mean Change in Seg. Index	Std. Dev.	Diff. Between Means	Sign. Level (two-tailed test)
Black-White Dissimilarity Index Change (1990 to 2000)					
in places *With* UGBs	40	-1.33	9.05	2.73	.113
in places *Without* UGBs	40	1.40	7.08		
Hispanic-White Dissimilarity Index Change (1990 to 2000)					
in places *With* UGBs	40	5.62	7.64	0.24	.880
in places *Without* UGBs	40	5.38	7.69		

Conclusions about changes in level of racial residential segregation. The evidence from this step of the analysis provides little or no support for the idea that urban growth boundaries contribute to lower (or higher) levels of racial residential segregation. Most places in the sample have low to moderate levels of residential segregation, and by 2000 differences in black-white and Hispanic-white segregation were small enough, between places in the sample with and without UGBs, to be statistically insignificant.

Multiple Regression Analysis of Urban Growth Boundaries' Effect on Level of Racial Residential Segregation

In this last step of the analysis I present two multiple regression analyses, one for black-white residential segregation and the other for Hispanic-white residential segregation. The dependent variable is the 2000 black-white and Hispanic-white indexes of dissimilarity. The independent variables are included based on each variable's theoretical relevance to the dependent variable. The independent of greatest interest is this study is: (a) whether or not the place has an urban growth boundary. Other independent variables of interest in the multiple regression models are: (b) percentage of the place's total population that was black or Hispanic in 1990 (size of the minority population at the start of the study period); (c) percentage of households paying 35% or more of their income in rent in 2000 (to address the affordability of rental units, which would be more likely to house low-income and minority residents than owner-occupied units); (d) number of housing units built in the 1990s as a percentage of all 2000 housing units (to address the changes in the local housing market, which affect housing availability and thus affordability); and (e) regional dummy variables (to capture geographic differences in residential segregation, but since no matched pairs of places in my sample are located in the Northeast, the dummy variables are for the South and West, while the Midwest serves as the regional reference category). Before presenting the multiple regression findings I provide results based on bivariate correlations of these variables (see Table 5).

The correlation between having a UGB and the black-white index of dissimilarity approaches but does not attain statistical significance ($r = .181$, $p = .096$). There is even less evidence of an association between the presence or absence of an UGB and Hispanic-white residential segregation ($r = .069$, $p = .529$). Thus, simple correlation analysis does not support the idea that having an urban growth boundary affects a place's level of residential segregation.

The 2000 black-white dissimilarity index has a positive, but weak, correlation ($r = .345$, $p = .001$) with the percentage of the total population that was black in 1990. Thus, places with larger black populations in 1990 were more residentially segregated in 2000 than were places with smaller 1990 black populations.

Considering Hispanic-white segregation, the percentage of the population that was Hispanic in 1990 has a positive, moderate correlation ($r = .447$, $p = .000$) with the 2000 Hispanic-white index of dissimilarity. In addition, three more independent variables have positive, but weak, correlations with the 2000

Hispanic-white index. They are: percentage of the total population that was black in 1990 ($r = .219$, $p = .042$), percentage of households that paid 35% or more of their income for rent in 2000 ($r = .341$, $p = .001$), and the place being located in the West, compared to being located in the Midwest ($r = .225$, $p = .038$). Thus, places with relatively larger black and Hispanic populations in 1990, places with a larger proportion of residents paying high rents, and places located in the West generally have higher 2000 Hispanic-white indexes of dissimilarity.

Table 5. Pearson Correlation Coefficients for Dependent and Independent Variables used in Multivariate Analysis.

	Black/white dissimilarity index, 2000	Hispanic/white dissimilarity index, 2000	Place has a UGB	Percent black pop., 1990	Percent Hispanic pop., 1990	% paying ≥35% for rent, 2000	1990s housing units as % of 2000 housing units
Black/white dissimilarity index, 2000							
Hispanic/white dissimilarity index, 2000	.485**						
Does place have UGB?	.181	.069					
Percent black population, 1990	.345**	.219*	-.117				
Percent Hispanic population, 1990	.077	.447**	.104	.119			
Percent paying 35% or more for rent, 2000	.047	.341**	-.088	.151	.462**		
Housing units built in 1990s as % of 2000 housing units	-.137	-.115	.070	-.146	-.207	-.267*	
Place is in West	-.150	.225*	.023	-.094	.549**	.559**	-.254*
Place is in South	.198	.011	-.031	.505**	-.141	-.038	.053

* $p \leq .05$. ** $p \leq .01$. (Two-tailed test)

The correlation matrix also reveals interesting findings about places with urban growth boundaries. Contrary to the claims of some critics of UGBs, the presence of these boundaries does not appear to increase the housing affordability problem. In other words, places with UGBs do not have higher percentages of households paying more than 35% of their income for rent ($r = -.088$, $p > .05$). In addition, contrary to those who claim that UGBs effectively slow down new housing construction, the insignificant correlation between UGBs and percentage of 2000 housing units that were built in the 1990s ($r = .070$, $p > .05$) indicates that places with and without UGBs do not differ in new housing construction. On the other hand, there is a statistically significant weak negative correlation ($r = -.267$, $p = .013$) between the "new housing" and "high rent" variables. This suggests that the addition of new housing helps to reduce the cost of rental units.

Factors affecting black-white segregation. Table 6, model 1 presents the multiple regression results used to identify and evaluate variables related to black-white segregation (based on all 86 places in the sample). The adjusted R^2 indicates that the independent variables in the model explain 15.2% of the linear variation in the 2000 black-white index of dissimilarity. Thus a great deal of the variation in places' levels of black-white segregation is unexplained by the variables in this model. Of greater substantive interest, this analysis shows that the presence of an UGB is a statistically significant predictor of the 2000 black-white index of dissimilarity ($b = 6.381$, $Beta = .244$, $p = .018$), controlling for the other variables in the model. Given the statistically insignificant relationship between UGBs and 2000 black-white segregation found in the previous steps of the analysis, this finding is quite interesting. It means that that controlling for other variables in the model, having an UGB is associated with having higher 2000 black-white dissimilarity index. In other words, when other factors are equal, places with an urban growth boundary tend to have higher indexes of dissimilarity (on average by 6.381 points), thus more black-white segregation, than places that lack an urban growth boundary.

The effects of two other variables are also noteworthy. The strongest predictor of the 2000 black-white dissimilarity index is percentage black in places' 1990 population ($b = .578$, $Beta =.343$, $p = .005$). Again, the effect is positive, that is, the places with a higher percentage of blacks in 1990 have a higher segregation. Also, a marginally significant variable, being located in the West, has a negative effect on the 2000 black-white index ($b = -6.518$, $Beta = -.249$, $p = .078$). On average and net of other variables in the model, places in the West have indexes of dissimilarity that are 6.518 points lower than places in the Midwest. Both of these results are consistent with previous research on black-white residential segregation.

The multiple regression analysis indicates that urban growth boundaries have an impact on black-white residential segregation. Specifically, it shows that a place's having a UGB is related to a somewhat higher 2000 black-white index of dissimilarity (i.e., greater segregation) rather than a lower index.

Table 6. Multiple Regression (OLS) Analysis of Black-White and Hispanic-White Residential Segregation (Index of Dissimilarity), 2000.

Variables	Model 1: Black-White Segregation, 2000	Model 2: Hispanic-White Segregation, 2000
	B (standard error) Beta	B (standard error) Beta
Urban Growth Boundary	6.381* (2.647) .244	1.326 (2.655) .050
Percent Black in 1990	.578** (.202) .343	----
Percent Hispanic in 1990	----	.495*** (.150) .404
Percent paying 35% or more for rent in 2000	.31 (.334) .118	.580† (.339) .218
Housing units built in 1990s as % of 2000 units	-.12 (.096) -.132	-.01 (.094) -.006
Region: West [a]	-6.518† (3.645) -.249	-2.86 (3.901) -.108
Region: South [a]	-2.06 (4.486) -.060	1.17 3.919 .034
Constant	16.193† (9.538)	1.522 (9.623)
Adjusted R^2	.152	.177
Number of Cases	86	86

Notes: † $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$

In each cell the top number is the unstandardized regression coefficient, middle number is the standard error, and bottom number is the standardized regression coefficient.

[a] Midwest is reference category for regions

Factors affecting Hispanic-white segregation. Table 6, model 2 provides the multiple regression results for Hispanic-white residential segregation. The adjusted R^2 (17.7%) for the Hispanic-white regression is very close to that of the black-white regression, indicating that much variation remains after considering the variables in this model. Upon closer inspection, however, the Hispanic-white regression results yield one valuable finding that differs from those of the black-white regression. Most importantly, the presence of an UGB is *not* a statistically significant factor affecting the 2000 Hispanic-white index of dissimilarity. Thus, there is not a relationship between whether or not a place has an urban growth boundary and its level of Hispanic-white segregation in 2000.

Only two independent variables are found to be statistically significant in influencing the 2000 Hispanic-white index of dissimilarity. The first is the percentage Hispanic in the 1990 population (b = .495, Beta = .404, p = .001). This is the strongest predictor of 2000 Hispanic-white segregation. The effect is positive, that is, places with larger Hispanic populations in 1990 had higher Hispanic-white segregation in 2000. A second marginally significant variable is the percentage of households paying 35% or more of their income in rent in 2000 (b = .580, Beta =.218, p = .092). This effect also is positive.

Discussion and Conclusion

My findings support the position that urban growth boundaries do not affect either the racial makeup of cities' and towns' in-movers or their population changes. First, the presence or absence of an urban growth boundary did not affect the racial/ethnic makeup of the in-movers to the cities and towns in the sample. This is the case whether the number of black or Hispanic in-movers is analyzed in relation to each group's 2000 size or in relation to the total number of in-movers. Second, the presence or absence of a UGB around each of the places in the sample did not influence blacks' or Hispanics' percentage change in population between 1990 and 2000. Thus these findings contradict the idea that urban growth boundaries hinder the in-movement and/or population growth of racial minorities.

The results of this analysis, however, are more ambiguous regarding the relationship between UGBs and racial residential segregation. On the one hand, two findings support Pozdena's (2002) claim that UGBs increase racial residential segregation. First, in 1990 the black-white index of dissimilarity was significantly higher in places with UGBs than in places without them (see Figure 1). Second, the black-white multiple regression analysis reveals that, with other variables controlled, having a UGB is associated with a place having a higher 2000 black-white dissimilarity index, on average, by about six points (Table 6 model 1). On the other hand, none of the statistical analyses used here (i.e., difference of means tests, correlations, multiple regression) found any significant relationship between UGBs and Hispanic-white residential segregation. Also, the multiple regression model that shows a positive significant UGB "effect" on black-white residential segregation leaves a lot of unexplained variation, which implies that it does not tell the "whole story." Further research would be useful to discover whether or not UGB's positive relationship with black-white residential segregation still holds when other good explanatory variables are added to the model. Moreover, we should keep in mind that the 2000 black-white dissimilarity indexes studied here are in the low or moderate range, both for places with and without UGBs, far below levels found in the larger U.S. cities and metropolitan areas. Research on blacks' preferences about desired racial composition of their neighborhoods indicates that they like residential areas with a substantial black presence (Charles 2000, 2001; Clayton et al. 2000). Given that most places in my sample have relatively low percentages of black residents, my regression results are actually not inconsistent with the claim that places with UGBs are where black residents are a little closer to achieving their preferred neighborhood racial composition.

In positioning my research in the ongoing debate about the impact of urban growth boundaries, I occupy the middle ground. That is, based on the evidence uncovered here, I do not concur with Pozdena's (2002) conclusion that "Portland style" growth containment policies exclude racial/ethnic minorities, nor do I see UGBs as a strong cause of racial segregation. But, neither do my findings support Nelson's (2004) contention that this growth control device promotes racial integration. My research also shows that conclusions based on comparisons of Portland and Atlanta often are misleading and should not go unchallenged.

This study also reveals some interesting insights into factors affecting black-white versus Hispanic-white segregation. First, it is important to note that the black-white and Hispanic-white multiple regression analyses share a common finding, namely that in both cases their respective 1990 group population size is positively linked to their 2000 index of dissimilarity scores. On further examination, however, the two multiple regressions reveal that different variables are associated with the 2000 level of black-white segregation than with the Hispanic-white segregation. For black-white segregation, the presence of an UGB has a significant positive correlation with 2000 black-white segregation, while being located in the West (as opposed to the Midwest) has a significant negative relationship. For Hispanic-white segregation, the percentage of households paying 35% or more of their income for rent in 2000 was significantly correlated with 2000 Hispanic-white segregation level.

Sociological and Policy Implications

Since this study yields mixed findings about the relationship between urban growth boundaries and their effects on racial/ethnic minorities, neither a strong "pro" nor "con" position can be taken regarding UGBs. The preponderance of evidence suggests that they are not harmful, but sociologists and urban planners should not be insensitive to or complacent about the possible effects of urban growth boundaries. Based on this study's results and the fact that boundaries have been used widely since only 1980, there is a need for continued interest in the possible racial impact of boundaries and how UGBs may interact with other urban or suburban land use, transportation, and development policies (which might or might not be consistent with smart growth principles). In the future, this analysis or a similar study should be conducted using 2010 Census data. As urban growth boundaries remain in force over many decades, their impact on the U.S.'s ever evolving cities and towns merits continued study.

It is also critical that planners and elected officials remain alert to and consider the possible effects of their land use decisions on the racial/ethnic makeup of residents. Just as an environmental impact study is a required part of many proposals, the possible sociological impacts should also be addressed. As Bobo suggests, "Always pose an explicit race question" (2000:307).

Gentrification continues to be a concern in relation to smart growth practices. As mentioned earlier, gentrification by whites and the displacement of blacks are occurring in both Portland, Oregon, and Seattle, Washington, two cities with urban growth boundaries (Harden 2006). These changes might be due, at least in part, to the cities' urban growth boundaries. Since the Pacific Northwest is the national leader in implementing smart growth measures, it is also at the forefront of revealing the effects of these techniques. Sociologists and urban planners should consider the recent dynamics in Portland and Seattle and check for possible unintended effects of smart growth.

Efforts can be made to ensure that minorities are considered by, and involved in, smart growth initiatives. Equity planners place a high priority on the needs of society's disadvantaged groups and seek to design cities that benefit all residents. Bobo (2000) suggests the following as measures planners should take to achieve this goal: incorporating the disadvantaged into the planning process, considering a proposal's possible effects on disadvantaged groups, advocating for low-income housing, and monitoring for possible housing discrimination and violations of anti-discrimination laws.

Planners can take additional measures to foster stable, racially integrated neighborhoods. These are suggested by the work of Ellen (2000) who identified factors that contribute to such neighborhoods. A range of housing options, including a substantial number of rental units, is correlated with integrated neighborhoods. Renting an apartment or house is more affordable than homeownership, making the area more accessible to minorities. Also, since social networks are important to maintaining stability, creating venues such as recreation centers, parks, and meeting facilities is vital. Likewise, ensuring that a neighborhood has amenities such as stores and services, good schools, and a low crime rate makes an area desirable to all--whites and minorities, owners and renters, and current and potential residents.

Conclusion

Is smart growth *fair* growth? This research, with regard to urban growth boundaries, shows that the answer is, for the most part, yes. This response is based on a definition of "fair" as an outcome in which urban growth boundaries do not hinder the in-movement, population growth, or residential integration of blacks or Hispanics.

As smart growth practices, and specifically urban growth boundaries, gain momentum, their possible effect on who lives in areas with boundaries becomes an increasingly vital concern. Further, as racial and ethnic minorities continue to make up a greater and greater proportion of U.S. residents, smart growth's impact on racial housing patterns is an important consideration for land use planners, sociologists, and society as a whole.

Appendix: List of pairs of places in sample

State	Place with urban growth boundary	Place without urban growth boundary
AZ	Chandler	Peoria
AZ	Mesa	Tempe
CA	Camarillo	Mission Viejo
CA	Cathedral City	Banning
CA	Dublin	Pleasanton
CA	El Cajon	La Mesa
CA	Grand Terrace	Loma Linda
CA	Martinez	Pittsburg
CA	Milpitas	Newark
CA	Oxnard	Oceanside
CA	Pinole	Hercules
CA	Pleasant Hill	Walnut Creek
CA	Poway	Santee
CA	San Diego	Dallas, TX
CA	San Rafael	San Pablo
CA	San Ramon	Danville
CA	Santa Paula	Santa Clarita
CA	Thousand Oaks	Simi Valley
CO	Golden	Broomfield
CO	Louisville	Lafayette
FL	Clearwater	Largo
FL	Pinellas Park	Bradenton
FL	Safety Harbor	Oldsmar
GA	Peachtree City	Newnan
IL	McHenry	Woodstock
IL	W. Chicago	Lockport
MD	Westminster	Aberdeen
MN	Chaska	Chanhassen
MN	Eden Prairie	Minnetonka
MN	Plymouth	Brooklyn Park
MN	Prior Lake	Savage
MN	Ramsey	Elk River
MN	Stillwater	White Bear Lake
MN	Woodbury	Oakdale
MO	O'Fallon	Bridgeton
MO	St. Peters	St. Charles
TX	Lancaster	Cedar Hill
TX	McKinney	Allen
WI	Franklin	Greenfield

State	Place with urban growth boundary	Place without urban growth boundary
WI	Kenosha	Racine
WI	Muskego	Glendale
WI	New Berlin	Brookfield
WI	West Bend	Watertown

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