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Vacating the City:
An Analysis of New Homes vs. Household Growth

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"The relationship between housing construction and household growth is a fundamental and potent factor in the dynamics of urban change."

Findings

An analysis of building permits and household changes in 74 of the largest metropolitan areas found that:

- **From 1980 to 2000, the number of new building permits exceeded the number of new households by nearly 19 percent, although there were dramatic differences between decades.** New housing permits outpaced household growth the greatest in the Northeast and Midwest, at 30 percent and 35 percent, respectively.
- **When metropolitan building permits outpace household growth, it generally comes at the expense of the central city and possibly older, inner-ring suburbs.** The size of a city's share of metropolitan area building permits affects its change in households. All but one of the 27 cities that lost households in the 1990s had a small share (less than 10 percent) of their area's building permits.
- **If housing permits lag household growth in a metropolitan area, then the central city will not lose households and may actually gain them.** In contrast, the more that new housing permits exceed household growth in a metropolitan area, the more likely the central city will lose households. But if the city's share of the area's permits is large enough, the city can escape household loss and can grow.

Overall, the relationship between housing construction and household growth is a fundamental and potent factor in the dynamics of urban change.

Introduction

The 1990s were an unusual decade in the recent history of American cities. As the country experienced the greatest economic expansion in its history, a number of major central cities, particularly in the Midwest and Northeast, had their smallest population loss since the 1960s. A few, including Chicago and Minneapolis, actually gained residents.[2] The price of housing on the East and West coasts skyrocketed while in the Midwest it elevated moderately. And concentrated urban poverty lessened in many big cities but grew in suburbs.[3]

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The high price of housing on the coasts, population growth in the large metropolitan areas of the South, Southwest and West, and the issue of "affordability" for low- and moderate income households across the country fueled the view that housing production was insufficient and that the shortfall was contributing to rising prices and limited housing choice.

Indeed, underlying all of the housing-related changes and issues of the 1990s were the factors of supply and demand. The nation grew by 13.5 million households while 13.2 million building permits were filled. Nationally, housing supply was just about in balance with population growth. But substantial variation exists across the country. While people flocked to Phoenix and the housing industry boomed, few went to Syracuse and builders there felt it. The question of supply vs. demand can only be answered locally.

This paper examines the extent to which new housing construction kept pace with household growth in 74 metropolitan areas between 1980 and 2000 (with particular focus on the 1990s). The paper assesses the impact of the balance or lack of it, on each area and considers consequent policy issues.

This paper is based on the proposition that the relationship is a fundamental and potent factor in the dynamics of urban change. Cities whose metropolitan areas consistently produce more housing than growth (and some do) face continuing, inescapable population loss and real estate abandonment. Cities whose areas consistently produce less housing than growth face a "tight" housing market and escalating prices. Sound policy will recognize the difference.

Background

Housing analysts have studied the relationship between new housing and growth for some time, particularly in the early years following World War II.[4] The housing boom that followed the war, the initial development of suburbs, the concern over slums, and the spread of urban deterioration prompted efforts to research and illuminate the dynamics of housing markets and neighborhood change. The basic model that emerged from that work is as follows:

In a typical metropolitan area, the amount of new housing built in a year exceeds the increase in the number of households living in the area, which results in a housing surplus; most of the new housing is located at the outer edges of the area; the purchase (or rental) of new construction by people moving-up enables households with lesser income to move in their wake - which in turn enables others to move, and so on down the levels of income. After all moves have occurred, and because the number of new units exceeds areawide household growth, some housing is left vacant. The surplus is evidenced at the bottom of the market where the least preferred places are abandoned - most likely in old central city neighborhoods. In the process, some existing housing "filters down" in value relative to most other properties, the likely end point of which, eventually, is abandonment. This model of metropolitan housing dynamics is evidenced most clearly in Midwestern and Northeastern metropolitan areas.[5]

The driving force in the process emanates from the surplus; without it, many moves would not occur and "new" housing opportunities for lower-income households would not open up. As one analyst put it "...one of our main purposes in studying the dynamics of the housing market is to see to what extent and by what means the market might be manipulated to produce a surplus of homes..."[6] This was the explicit policy mechanism born in the Great Depression for improving conditions for the low-income residents of cities: enable them to move from bad to better housing in the private market, which required people with higher incomes to move before them, led at the front by buyers and renters of new construction.

The resulting surplus and depreciation were considered beneficial. The worst housing was being eliminated and society, overall, was better off. The remaining challenge was "residential renewal" of fully depreciated and abandoned locations. Renewal in combination with a continuous surplus would, it was assumed, eradicate slums and breathe new life into cities. But renewal did not happen at a scale consistent with the extent of decline and abandonment.

The constant movement of population through an ever-expanding metropolitan supply of housing creates continuous erosion. However, for some cities in recent years immigration has provided a degree of salvation. Chicago, for example, gained 207,792 Hispanic residents in the 1990s while the city's overall population grew by 112,290.[7] Immigrants occupied housing that otherwise would have been empty. If Buffalo or Detroit had had the same rate of immigration as Chicago in the 1990s, they too might have had population growth. The impact of housing "oversupply" is starkly evident in many Midwest cities because of the lack of immigrants moving in to occupy housing being vacated by movers-out.

The domino-like process of decline has progressed to where it now affects old suburbs in the Midwest and Northeast. Decline is expanding the opportunity for low-income households, most of whom live in privately owned properties, to have a suburban address. The continuation of housing oversupply in some markets may lead to a future (decades ahead) where

more low- and moderate-income people will live in suburbs than in central cities.

Data and Methodology

As defined here, the measure of surplus (or shortage) is simply the difference between change in the number of households living in an area and change in the size of the area's stock of housing. This study used U.S. Census data on building permits as the measure of change in stock.[8] But a number of factors cause that measure to be an approximation. Change in the size of an area's supply of housing is the net result of the number of units constructed, the number demolished, and the number converted in use to or from housing. This study did not take into account demolitions, conversions, nor units lost due to aging which in some places can be significant over the course of a decade.[9] Manufactured housing was not accounted for. Further, all building permits did not necessarily result in construction, although the vast majority did, and the number of permits may not have been accurately reported. On the "demand" side, the census of households in major cities is known to result in undercounts.[10] Those various factors produced an unknown amount of distortion in the analysis.

Additional distortion was possible because of an assumption made in structuring the methodology: It was assumed that the entire supply of suburban housing was occupied (except for normal vacancy) and that all surpluses (if any) would be located in the central city. That is, the "worst" housing and least desirable locations in the area were assumed to be entirely in the central city and not at all in suburbs. That assumption probably is true, or true for all practical purposes, for most areas. But where it is not, distortion resulted. Cleveland is an example. A Cleveland suburb, East Cleveland, has approximately 3,500 abandoned units, 13 percent of Cleveland's 27,000.[11] East St. Louis in relation to St. Louis is another example (4,000 vs. 42,500, or 9.4 percent).

The analysis also can be distorted by having two or more major or comparable cities in the same metropolitan area. If there is a surplus, where is it located? For each metropolitan area this analysis considered all "central cities" as defined by the U.S. Census Bureau. The central cities retained for the calculations were those with the largest number of metropolitan households for the year 2000, plus any of the other central cities which had at least half as many households as did the largest city.

In eleven cases, cities were in effect combined to function as "the central city" (e.g., Tampa / St. Petersburg and Raleigh / Durham); in others one of the cities was designated as "the central city" because of apparent likelihood that it would be the primary recipient of surplus (e.g., Norfolk was judged to be primary over Virginia Beach).

Further distortion can come from close proximity of two metropolitan areas. Primary Metropolitan Statistical Area (PMSAs) data were used where Consolidated Metropolitan Statistical Area (CMSA) possibilities were involved. For example, Cleveland and Akron are both primary metropolitan areas as defined by Census, but the central cities are just 40 miles apart and are in the same metropolitan housing market. So the Cleveland-Akron-Lorain CMSA was analyzed as two separate PMSAs: Akron and Cleveland-Lorain-Elyria. For all others that are not part of CMSAs, MSA data were used.

Because of those possible sources of distortion, the resultant measures in this analysis should be considered "rough" or approximate. However, as will be seen, the documented patterns and relationships indicate significance.

The initial intent of the study was to analyze the 100 largest metropolitan areas; however, for various reasons, 26 were eliminated. All single-county metropolitan areas were excluded, in particular because some, such as Los Angeles County and Miami-Dade County, were imbedded in larger metropolitan areas.[12] They (and New York) were dropped because of their complexity (one could not reasonably assume where household loss, if any, would be located). Areas without a major city were excluded (e.g., Nassau-Suffolk NY and Bergen-Passaic, NJ), as were some that had missing data. The final sample of 74 areas (MSAs and PMSAs) ranged in composition from two counties to 18.

Some counties were dropped from the analysis because of obviously incomplete numbers of building permits but the rest of metropolitan area was retained. Those areas, therefore, do not correspond to the Census Bureau's official definition. The excluded counties were small and had little effect on the analysis[13] Mobile, AL had missing data for the decade of the 1980s and was excluded from analysis of that decade but was included in analysis of the 1990s.

The first step in the analysis was to compute for each metropolitan area a ratio of the total number of building permits (units) recorded in a decade to the increase in the number of households living in the area, and the percentage difference between permits and household change. A ratio greater than 1.0 indicated a housing surplus—the number of units built exceeded household growth. The higher the ratio, the greater the surplus.

If the assumption was accurate that the central city would be the location of most of the surplus, then cities within metropolitan areas with ratios greater than 1.0 should have lost households and had an increase in housing vacancy. A ratio less than 1.0 indicated a "tight" housing market in which more households were added to the area than was the expansion of the supply through new construction. In that situation, city vacancy should

have declined and the number of households should have increased.

Findings

A. From 1980 to 2000, the number of new building permits exceeded the number of new households by nearly 19 percent, although there were dramatic differences between decades

In the 74 metropolitan areas analyzed, the total amount of building permits issued outpaced the growth in the number of households by more than 2 million units, or 18.8 percent. The ratio of permits to household change in all metropolitan areas surveyed was 1.19. However, there were wide variations between the two decades. During the 1980's building permits outpaced household growth by 29.4 percent. During the 1990s the difference was only 9.4 percent. Clearly, the pace of housing construction is not geared to the extent of household change (Table 1).

What used to be explicit policy of production to achieve surplus no longer is explicit. New housing is built to the extent that it is consumed, and when economic conditions weaken demand, steps often are taken to boost it (such as by lowering interest rates). No regard is given to the possibility of surplus and its implications. But the dynamics today are exactly as they were 50 years ago. If the supply of housing in a metropolitan area is expanded through new construction more than the growth of households living in the area, housing somewhere in the area must become vacant. Surplus and depreciated real estate are inevitable.

The dramatic difference between the 1980s and the 1990s probably was the result of the Tax Reform Act of 1986 which reduced the financial incentive to invest in multi-family housing. Prior to this Act, investors could make sheltered investments in real estate. Indeed, multi-family permits in the metropolitan areas in this study declined from 42 percent of all permits in the 1980s to 24 percent in the 1990s. If the effect of the pre-change tax code was to promote multi-family construction beyond normal market demand, then the permit data for the1980s contained distortion that undermined the analysis. In other words, there were more multi-family permits than called for by true market demand.

Assuming that was the case, the analysis focuses primarily on the 1990s, when the difference between households and permits, while still striking, was not as severe. During the 1990s building permits outpaced the increase in households by just over half a million.

In addition to the variation between decades, there were major differences in the ratio of building permits to household growth from region to region. From 1980 to 2000, the highest ratios existed in the Midwestern metropolitan areas with a 35 percent difference in permits to

Table 1. Building Permits and Household Change, by Region

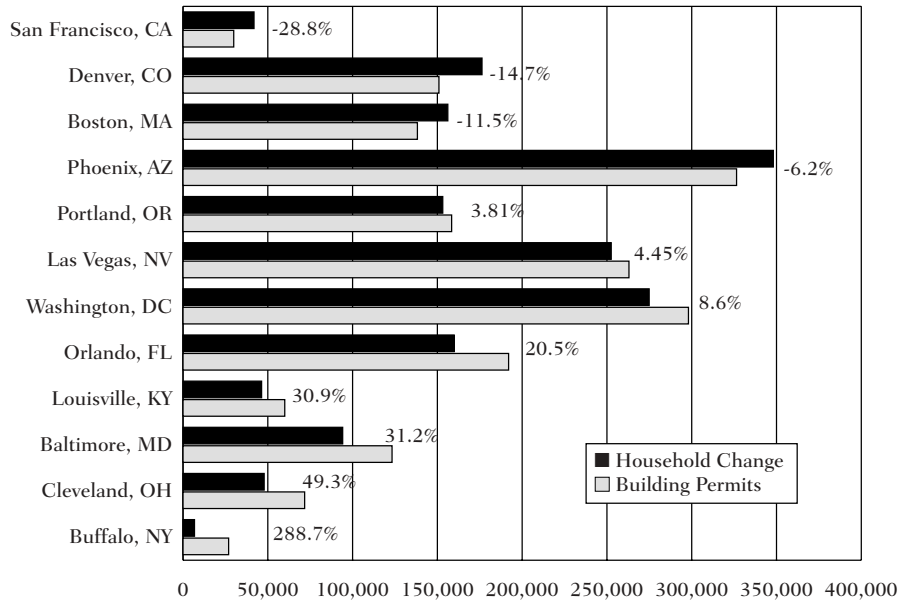
	Number of metro areas	Building Permits	Household Change	Ratio	Percent difference in permits to households
1980s					
Midwest	19	1,384,214	928,041	1.49	49.15%
Northeast	15	989,195	722,891	1.37	36.84%
South	28	3,304,612	2,584,399	1.28	27.87%
West	12	1,745,069	1,500,953	1.16	16.26%
U.S.	74	7,423,090	5,736,284	1.29	29.41%
1990s					
Midwest	19	1,659,743	1,335,038	1.24	24.32%
Northeast	15	721,253	596,890	1.21	20.84%
South	28	2,840,301	2,685,984	1.06	5.75%
West	12	1,589,173	1,624,712	0.98	-2.19%
U.S.	74	6,810,470	6,242,624	1.09	9.10%
Total					
Midwest	19	3,043,957	2,263,079	1.35	34.51%
Northeast	15	1,710,448	1,319,781	1.30	29.60%
South	28	6,144,913	5,270,383	1.17	16.59%
West	12	3,334,242	3,125,665	1.07	6.67%
U.S.	74	14,233,560	11,978,908	1.19	18.82%

households. During the 1980s the Midwest peaked at almost 50 percent; and although that figure declined by about half in the 1990s, the Midwestern, as well as the Northeastern rates, far outpaced the national average. By contrast, while building permits exceeded household growth in the West by 16 percent during the 1980s, the situation was actually reversed in the next decade. During the 1990s, household growth in Western metropolitan areas surpassed the number of permits by 2 percent. Overall, permits outpaced households by only 7 percent from 1980 to 2000 in the West.[14]

Of course, these federally-defined regions are quite large and there are stark differences between metropolitan areas in the same region: Buffalo vs. Boston in the Northeast, and Baltimore vs. San Antonio in the South. But in the aggregate, the regional statistics tell an important story.

Homebuilders construct what they can sell; they do not consult demographers and then equate their production volume to projected household growth. They build even when household growth is nearly zero (which was the case, for example, in the Youngstown, OH, metropolitan area in the 1980s). The Buffalo metropolitan area presents a clear example of the impact of new construction exceeding household growth by a wide margin. In the 1990s, housing construction in the Buffalo metropolitan area exceeded household growth by nearly four-to-one. New housing and growth were greatly imbalanced: for every additional household living in the area, four new homes were built. A housing "surplus" was the inescapable result. Somewhere in the Buffalo area housing that was occupied in 1990 was vacant in 2000. During that period the city of Buffalo's vacancy rate increased 5.5 percentage points to 15.7 percent and the city lost ten percent of its households. At the same time, the number of households living in the suburbs grew by 6.3 percent.[15]

Figure 1. Household Change and Building Permits, 1990-2000, by Select Metropolitan Area with Percentage Differences



At the other end of the spectrum, construction and growth in the Denver area during the 1990s were imbalanced, with less new housing than growth. In that "shortage" situation, the city of Denver's vacancy rate declined by 7.1 percentage points and its households grew by 13.4 percent (Figure 1).

Possibly two factors cause most of the variation in disparity between building permits and growth among the areas: land costs and strength of the local economy. Where the economy is weakest and land costs are lowest (the Buffalo area in the 1990s representing that extreme) may be where high permits-to-growth ratios are most likely to occur; where the economy is strong and land costs high (San Francisco in the 1990s representing that extreme) may be where low ratios are most likely. (It should be noted that because of the "roughness" of the data used in this analysis, the extremes may be more discernable than places where ratios are fairly close to being in balance.)

B. When metropolitan building permits outpace household growth, it generally comes at the expense of the central city and possibly older, inner-ring suburbs.

Table 2 shows the overall impact of new housing exceeding growth. While central cities in the South and West (with aggregate average ratios of 1.06 and 0.98, respectively) grew with households and had lower vacancy rates across the 1990s, cities in the Midwest and Northeast (with ratios of 1.24 and 1.21, respectively, either lost households or gained only slightly, and had more vacancies or a slight decrease.

Of course, all metropolitan areas throughout the county must accommodate some degree of new housing (there has to be some replacement of fully depreciated structures). Areas with little or no household growth still have substantial movement and demand for new housing. How much new housing can be located in a central city? If a city, such as Phoenix, has large amounts of undeveloped

Table 2. Central City Household and Vacancy Rate Change, by Region, 1990s

Region	Number of Metro Areas	Metro Ratio	Central City Percent Change in Households	Percentage Point Change in Vacancy Rate
Midwest	19	1.24	1.8	-0.2
Northeast	15	1.21	-2.3	0.6
South	28	1.06	12.2	-3.4
West	12	0.98	16.3	-2.5
US	**74**	**1.09**	**7.6**	**-1.8**

land, much can be built. But if all a city's land has been developed (i.e., built out with no virgin land) then it must reuse sites, making second generation development more difficult.

With more new housing than growth, abandonment is unavoidable—and the more that construction exceeds growth, the greater the abandonment. In most cases, particularly in the Northeast and Midwest, the central city bears the brunt of abandonment—while suburbs are generally fully occupied (through movement up).

Appendix Table A displays the 74 metropolitan areas ranked on their 1990s ratio of building permits-to-household growth. Again, Midwestern and Northeastern metropolitan areas such as Buffalo and Pittsburgh dominate the top of the list. In Pittsburgh, almost three units of new housing were built for each additional household living in the area; 55,936 housing permits were recorded while the area grew by only 19,252 households. As a consequence, the city of Pittsburgh lost 6.3 percent of its households and its vacancy rate increased 2.2 percentage points.

This trend of central city abandonment follows a common theme. All but two of the cities (Akron and Kansas City, MO) in metropolitan areas where permits exceeded household growth by the highest percentage, above 25 percent, lost households, while most cities in areas below that threshold gained households or lost slightly. With the minor exception of Newark, all cities in metropolitan areas where household growth outnumbered permits gained households. Change in city vacancy rates between 1990 and 2000 follows the same pattern. Again, cities in the Midwest and Northeast tended to have high ratios; cities in the West and South tended to have comparatively low ratios.

All but one of the 27 cities that lost households in the 1990s (Toledo being the exception) had a small share of their area's building permits - less than 10 percent. And 20 cities had less than five percent. Toledo had a high ratio and lost households, but not many (1.5 percent). It also had a "large" share of the area's new construction: 11.9 percent (large relative to other cities with high ratios). Kansas City, MO had a high ratio but it gained households (3.6 percent). It also had 15.1 percent of its area's building permits.

The size of a city's share of metro area building permits affects its change in households. Other cities that had a ratio above 20 percent but did not lose households included some with very high shares: Wichita (53.8 percent), Omaha (57.4 percent), Indianapolis (33.9 percent) and Fresno (45.3 percent). Most cities with large shares also had the largest household increases among the 74.

If a metropolitan area grows in households over the course of a decade, and if all the area's new housing is located in the central city (none in the suburban portion of the area), then a number of households equal to the growth would have to live in the city. As the city's share decreases (and the suburban share increases), the city's gain in households decreases (assuming all suburban housing is occupied). If a city's share is large enough, it can reduce or even eliminate the negative effect of a high ratio on households. Kansas City and Wichita are examples.

Most cities, however, probably cannot escape the second negative effect of a high ratio: abandonment. A high ratio means that housing must become vacant somewhere in the area. The framework of this analysis assumes that the central city contains the housing that is at the bottom of the areawide market, and surplus housing resulting from new construction exceeding household growth leads to vacancies and abandonment in that segment of the market—irrespective of the city's share of the area's new housing. Regardless of the size of the city's share, the amount of surplus vacant housing remains the same.

The negative impacts of "oversupply" in a metropolitan area can also involve suburbs—particularly older, inner ring suburbs. A recent study of suburban population change in the 35 largest metropolitan areas between 1990 and 2000 found that while 63 percent of all suburbs grew, 37 percent actually lost population or stayed the same.[16] The study found that declining suburbs were predominately located in slow growing areas in the Northeast and Midwest.[17] The areas with the largest percentage of suburbs that declined were Buffalo, Philadelphia, Pittsburgh, Cincinnati, Cleveland, Detroit, and St. Louis. Six of those areas had permit-to-household ratios in the 1990s of 1.46 or higher, and the seventh, Philadelphia, was 1.22.

In addition to having homes that may not meet contemporary tastes and standards, older or "first" suburbs are also hurt by consumers' desire to buy "up and out" in their housing. For instance, from 1997 to 1998, about 86 percent of the homeowners who moved in the Cleveland, Columbus, and Cincinnati metropolitan areas bought homes that were 57 to 69 percent more expensive than the homes that they had left. In all three of these regions, most higher-priced homes were located "farther out."[18] Homes in the first suburbs tend to be occupied by lower-income households, negatively affecting the local tax base.[19] This phenomenon can be exacerbated by a large and continuous metropolitan "oversupply", leading to an excess of housing stock in first suburbs that eventually is abandoned.[20]

Those negatives will not occur in metropolitan areas in which the amount of new housing equates closely with household growth, which was the case for numerous areas in the West and South where central city households increased and vacancy rates declined. The contrast with metropolitan areas in the Northeast and Midwest is striking.

Although cities in metropolitan areas with high ratios cannot avoid household loss (unless their share of their area's new housing is large enough), growth can occur at the sub-city level. A recent study of 24 major cities found that six had downtown population growth in the 1990s even though the city as a whole lost population.[21] The six—Baltimore, Cleveland, Detroit, Milwaukee, Norfolk and Philadelphia—are all places with high ratios. A high ratio and household loss do not preclude a city from having population growth in one or more of its districts.[22]

A recent Brookings report found that in the 1990s, the bulk of central city growth took place along the suburban borders. Between 1990 and 2000, the "inner core" of central city census tracts— those located in and around the CBD— increased in population by only 2.7 percent overall (Figure 2). The "middle ring" grew at a little more than twice that rate (6.2 percent), while the "outer ring" boomed in population (15.1 percent growth). As a result of this population shift toward city borders, more people across the 100 largest cities now live in outer-ring neighborhoods (19.5 million) than in either middle-ring (19.4 million) or inner-core (16.9 million) neighborhoods.[23]

C. If housing permits lag household growth in a metropolitan area, then the central city will not lose households and may actually gain them. In contrast, the more that new housing permits exceed household growth in a metropolitan area, the more likely the central city will lose households. But if the city's share of the area's permits is large enough, the city can escape household loss and can grow. Several hypotheses were tested to confirm the relationships between ratio, household change and the location of new housing (city or suburbs).

Hypothesis 1: The central city will not lose households if the area ratio is less than 1.0. For the 1980s, there were no cases in which both the ratio was less than 1.0 and the central city lost households. For the 1990s there was one case, Newark, with the ratio of 0.99 and the city of Newark lost 170 households—a marginal exception.

Hypothesis 2: The higher the ratio, the more likely the central city will lose households, and, conversely, the lower the ratio, the more likely the city will gain households. A simple correlation test between ratio and percent household change for the 1980s resulted in a very weak correlation (-0.15404); the test for the 1990s resulted in a moderate correlation (-0.45740).

The correlation treats the relationship between ratio and household change as being linear—that is, a strong correlation requires an increase in percent household loss as the ratio increases. The test for the 1990s produced a moderately strong correlation. A less formal test of the hypothesis was done with a measure not based on an assumed linear relationship. Appendix Table A contains the metropolitan areas and central cities ranked by ratio and grouped by quartile. If the hypothesis holds, the percentage of cities within each quartile that lost households should decrease from the top of the table (highest ratios) to the bottom (lowest ratios). That is the case.

The top quartile ranges from Buffalo (ratio 3.89) to Louisville (1.31). All but two of the 17 cities, 89.5 percent, lost households. The second quartile ranges from Rochester (1.30) to Raleigh-Durham (1.08). Seven of the cities, 36.8 percent, lost households - and down the table, as follows:

Quartile	Cities that Lost Households (%)
Top	89.5%
Second	36.8%
Third	16.7%
Bottom	0.0%

The hypothesis is confirmed: The higher the ratio, the more likely the central city will lose households, and, conversely, the lower the ratio, the more likely the city will gain households. Most of the cities in the top quartile (highest ratios) are in the Midwest or East, while most of the cities in the bottom and third quartile are in the West or South.

Two of the cities in the top quartile, Kansas City, MO and Akron, gained households (although Akron's gain was just 0.2 percent). Kansas City also had the largest share of its area's building permits (15.1 percent) among all cities in the top quartile, and Akron had the third largest (11.1 percent). Most of the cities in the top quartile had less than five percent - which leads to the

Table 3. Cities that Lost Households in the 1990s: New Housing Needed to Eliminate Household Loss

			City Permits, % of Metro Area		
Metropolitan Area	Region	Metro Area Percent of Permits to Household Change	New Housing Needed to Breakeven	New Housing Actual	Change in Central City Households
Buffalo, NY	NE	288.7%	58.9%	7.8%	-10.1%
Youngstown-Warren, OH	MW	134.5%	40.5%	2.5%	-10.3%
Syracuse, NY	NE	68.5%	37.5%	3.9%	-8.4%
Scranton-Wilkes-Barre, PA	NE	152.5%	25.4%	4.5%	-5.4%
Detroit, MI	MW	47.9%	24.1%	2.0%	-10.1%
Toledo, OH	MW	47.6%	22.3%	11.9%	-4.5%
Pittsburgh, PA	NE	190.5%	20.6%	3.2%	-6.3%
St. Louis, MO	MW	70.1%	17.9%	1.7%	-10.8%
Dayton, OH	MW	121.1%	17.6%	2.1%	-7.2%
Milwaukee, WI	MW	38.6%	17.5%	5.4%	-3.5%
Rochester, NY	NE	30.2%	17.5%	2.8%	-4.9%
Cleveland, OH	MW	49.3%	17.4%	4.5%	-4.6%
Baltimore, MD	S	31.2%	16.6%	1.6%	-6.7%
Albany-Schenectady, NY	NE	34.8%	16.4%	5.1%	-4.1%
Philadelphia, PA	NE	22.3%	12.7%	3.3%	-2.2%
Hartford, CT	NE	78.5%	10.8%	1.1%	-12.6%
Cincinnati, OH	MW	46.3%	10.8%	4.0%	-4.0%
Springfield, MA	NE	26.4%	10.8%	6.9%	-1.1%
Gary, IN	MW	48.7%	9.2%	0.2%	-6.6%
Louisville, KY	S	30.9%	9.2%	6.5%	-1.5%
Norfolk, VA	S	29.6%	6.9%	3.1%	-3.7%
Harrisburg, PA	NE	17.5%	4.8%	1.2%	-4.5%
Richmond, VA	S	14.5%	4.5%	3.3%	-0.9%
Greenville-Spartanburg, SC	S	4.5%	4.3%	4.3%	-1.1%
Allentown, PA	NE	5.5%	2.2%	2.2%	-1.7%
Washington, DC	S	8.6%	1.3%	0.8%	-0.5%
Average		**63.0%**	**16.8%**	**3.7%**	**-5.3%**

next hypothesis.

Hypothesis 3: The larger the city's share of metropolitan building permits, the less the city will lose households (if the ratio is above 1.0), or the more it will gain (if the ratio is below 1.0). Where new housing is located in a metropolitan area affects city household change. Theoretically, if all new housing was suburban, and the area ratio was above 1.0, the central city would be unable to gain households (assuming no abnormal surplus existed in the suburbs). The city would inescapably lose households—and bear the brunt of the consequent surplus. At the other extreme, if all new housing was located in the city (and the suburban supply were to remain fixed), the city would receive all of the area's household growth—but still bear the brunt of the consequent surplus. Thus, the more that building permits are in the city, the less the city will lose households (if the ratio is above 1.0).

The statistical test confirmed the hypothesis. Fifty-four metropolitan areas had a ratio above or equal to1.0 for the 1990s; for this group the correlation is moderately strong (0.61124). Twenty areas had a ratio less than 1.0 for the 1990s; for this group the correlation is moderate (0.49395).

Roughly, a city in a metropolitan area with a ratio of 1.4 needed a share of its area's permits in the order of 16 percent to avoid household loss. Cities with higher ratios generally needed a larger share than that, and cities with lower ratios generally needed a smaller share (Table 3).[24]

Policy Implications

A recent article asked whether the United States is undersupplying housing. The author noted that for several reasons (mainly the Tax Reform Act of 1986) housing production in the 1990s decreased from the 1980s and that "... another decade of undersupplied housing could make already

unaffordable markets even less accessible." The article focused on major coastal places like San Francisco and Boston.[25] But in the 1980s, when production volumes were indeed larger than the 1990s, 64 of the 74 cities in this study (86.5 percent) had increases in vacancy. Analytically speaking, the last thing that Northeast and Midwestern cities such as Buffalo, St. Louis, Detroit, and Pittsburgh needed was more housing that would have resulted in more abandonment.

The results of this study and the article mentioned above confirm that housing is undersupplied in some areas, oversupplied in others, and appropriately supplied in still others. Thus whether housing is undersupplied is too broad a question. A more pertinent question might be what is the right amount of new housing for a particular metropolitan area?

But is an answer other than "what the market will absorb" feasible? Should homebuilding in the Buffalo area during the1990s have been 75 percent less than it was in order to have matched the area's household growth? Only *extreme* governmental control—extreme in relation to the nation's practice of free enterprise—could have achieved such a limitation.

At the same time, policies to boost production are taken for granted. The above-cited article reflects that purpose:

> "Before housing affordability reaches crisis dimensions in many places, it is possible that the market will undergo a major correction. But it is unlikely that market forces alone will solve the undersupply problem. There are, however, several policy initiatives [such as expanding low-income tax credits for multi-family construction] that could immediately facilitate more housing production."

As our research suggests, clearly there is a supply problem in some major markets. However, calls for more production must consider the metropolitan housing market and should be accompanied by attention to possible negative consequences of more production. New multi-family housing for low-income households in an area where production exceeds growth will result in more abandonment. But that may be, after thoughtful consideration, an acceptable consequence, particularly if the construction is located near suburban centers of employment growth.

An issue that has yet to be explicitly addressed in the still young life of American cities is, who is responsible for redevelopment of obsolete, bottom-of-the-market, fully depreciated real estate? Thus far the answer has been the host jurisdiction—with some assistance from the federal government, and possibly some from state government. The total community in which the real estate is located—the metropolitan area—is held harmless (although, as state and federal tax payers, residents indirectly pay something). But the primary responsibility lies with the community as a whole, the metropolitan area. That responsibility invariably is denied by means of jurisdictional boundaries and perceptions of home rule, which cultivate the attitude that each unit of government is independent and each alone is responsible for its condition.

A prominent exception is the Minneapolis-St. Paul metropolitan area, where over 25 years of tax-base sharing has been practiced. There, an increment of property tax revenues produced by commercial and industrial development is shared with jurisdictions whose tax revenues are relatively weak, reducing fiscal disparities.[26] The policy represents one of most direct and responsible ways for a metropolitan area to address problems created by obsolete and seriously depreciated real estate. Jurisdictions with those problems are not left to cope on their own, and the buck is not passed to federal or state governments. However, tax sharing is contentious; communities that give up revenues do not necessarily like it. But as some of them eventually age to where troubled real estate and deteriorated infrastructure begin to weigh on them, resistance to the system could fade.

Other less contentious actions can serve the objective of increasing urban redevelopment. The state of Maryland's "smart growth" program has become a featured example due to its emphasis on using state resources and policies to strengthen older communities and reduce urban sprawl. A growing number of states are following suit. In a sense, they all are grappling with how to influence or control private investment in real estate as suburban sprawl, urban decline, and traffic congestion have intensified. These initiatives are emerging within a context of national attitude that holds that government has no business messing with the free market and the rights of property owners. But the negative consequences of ever-outward suburban development, and in many places inner abandonment, are forcing attitude change. Like tax-base sharing, as the benefits of new ways of influencing the location of investment in real estate become apparent, attitudes will change.

The state that has gone the furthest with comprehensive efforts to manage growth is Oregon, where "growth boundaries" around metropolitan areas are required.[27] Coupled with policies that strongly support urban redevelopment and maintenance, a growth boundary generates forces that stimulate urban core investment—which is exactly what a city in an area with a consistently high ratio needs. "Inward forces" (as opposed to outward forces associated with unbridled suburban development) draw private investment to opportunities in the urban core that otherwise would not exist or be considered. Public funds to address unusual costs associated with redevelopment may still be required but less than without containment. Contain-

ment of outer development may raise the cost of housing and real estate in general, but the alternative can be a steady stream of abandonment that is not matched by redevelopment.[28] Containment costs nothing, it is just policy, but it is as politically challenging as tax-base sharing, if not more so.

The figures reported in this study for the Portland area, with its growth boundary, are striking: the ratio of housing construction-to-growth in the 1990s was 1.04; the city's share of areawide building permits was 11.9 percent, its households grew by 19.5 percent, and its vacancy rate hardly changed. Those figures suggest that Portland and its area in the 1990s were in optimal balance of development.

As long as Detroit, Philadelphia, St, Louis, Baltimore, Rochester, Cleveland, Pittsburgh, Buffalo, Cincinnati, Milwaukee, Syracuse, and others are faced with consistently large areawide disparities between new housing and growth, initiatives to strengthen those cities need to be as potent as the destructive power of the disparity. An Oregon-style approach coupled with tax-base sharing would likely be effective. That solution probably is a remote possibility at best. However, a feasible and significant step in that policy direction would be a smart growth program, as Maryland has created. Time will tell if Maryland's program is potent enough to lower the permits-to-growth ratio in the Baltimore area and/or increase substantially the city's share of new housing. If it is, then other states will have evidence to act accordingly.

As discussed, abandonment is an inescapable consequence of new housing exceeding growth, but to the extent that a city can increase its share of the area's new housing, it can reduce its household loss.[29] That can be a sizable challenge if the city is "old" and built-out. Extensive redevelopment usually is the only option, although some existing structures can be upgraded or converted to residential use (substituting for new construction). Redevelopment, however, typically costs more than "greenfield" suburban development because of expenses associated with creating "new" construction sites (e.g., demolition, site assembly, brownfield cleanup).[30] Cities with the greatest needs usually lack resources required to produce redevelopment at a scale sufficient to offset abandonment and household loss.

Cities in areas with a ratio slightly higher than 1.0 probably would be best served by no change. The ideal ratio might be around 1.05, which would create some brake on prices and would allow for abandonment of some of the worst housing. A small amount of annual abandonment and household loss (depending on the city's share of new supply) should be manageable.

By contrast, metropolitan areas with a ratio less than 1.0 undoubtedly need more housing (Boston in the 1990s was 0.88). Increasing the ratio to 1.0 or slightly more than 1.0 would result in no negative consequences (assuming the city's share of production is sufficient to prevent household loss). Pressure on housing costs would be reduced. Cities in metropolitan areas with a ratio near or below 1.0 are receiving maximum use of the existing supply of housing. In this situation, little if any housing is being abandoned and non-residential buildings possibly are being converted to residential use. The lower a ratio is below 1.0, however, the greater the shortage and, probably, the higher the cost of housing.

Cities in areas where the ratio of new housing-to-household growth is continuously high require major policy support at the state and metropolitan levels to accomplish the needed scale and continuity of redevelopment. The higher the ratio, the greater the need for policy that supports redevelopment. Policies often involve the use of public funds to promote private investment, such as by financing demolition and site assembly. These investments are necessary to make project profit margins competitive with developments in outer suburbs.

Clearly, the amount of money needed to accomplish redevelopment in the face of extensive and continuous abandonment can be enormous. St. Louis (ratio of 1.70) had 20,000 units abandoned in the 1990s and lost 18,000 households. Philadelphia (ratio of 1.22) is spending $160 million to demolish 10,000 structures; Detroit (1.48) has targeted 12,000 structures at a cost of $120 million.[31] However, while redevelopment may be expensive, what is becoming increasingly clear in these places is that the cost of doing nothing is even greater.

Conclusion

One thing that this report has made abundantly clear is that low household growth in a metropolitan area does not necessarily result in correspondingly low housing construction. Numerous cities in the Midwest and Northeast in particular are evidence of that. While the Buffalo area had household growth of only 1.5 percent for the entire decade of the 1990s, almost four units of housing were built for each additional household. Builders may give some attention to growth figures, but they do not equate production volume to them. Builders produce what they can sell—irrespective of actual or projected growth.

Variation of ratio among areas stems from variation in economic conditions.[32] Economic growth attracts households, and where growth is strong (as it was in the West and South during the 1990s), expansion of the housing supply is more likely to be in pace with growth (accompanied by upward pressure on housing prices). Where economic growth is not strong, neither is household growth, but demand for new housing still exists.

This survey report also points out that the balance between an area's household growth and expansion of the supply of housing through construction can have major negative impact on the central city. The more that new housing exceeds growth, the greater the impact in terms of household loss and abandonment (and depreciated real estate). Cities in this situation cannot prevent abandonment. Negative conditions appear to form when the ratio of new housing-to-household growth exceeds approximately 1:1.

The only recourse available to a city in an area with a high ratio is to increase the size of its share of the area's new housing (which can include upgrading or converting existing stock such that it substitutes, in effect, for new construction). Housing production, of course, is not an automatic solution. People who could otherwise live in a suburb have to want the product in the city, including the specific location and associated conditions. Factors such as safety, availability and quality of services, and schools typically influence move decisions.

The relationship between housing construction and household growth may seem like an arcane academic consideration but it is a fundamental and potent factor in the dynamics of urban change.

Acknowledgments

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Appendix Table A: Metropolitan Area and Center City Building Permits and Household Change, 1990–2000

			Metropolitan Area				Central City(s)					
Rank	Name	Region	Permits	Household Change	Ratio	Percentage Difference	Name(s)	Change in Households	% Change in Households	Vacancy % Point Change	Permits	Central city permits as a % of metro permits
FIRST QUARTILE												
1	Buffalo-Niagara Falls, NY MSA	NE	26,881	6,916	3.89	288.68%	Buffalo, NY	-13,716	-10.1	5.5	2,109	7.8
2	Pittsburgh, PA MSA	NE	55,936	19,252	2.91	190.52%	Pittsburgh, PA	-9,744	-6.3	2.2	1,781	3.2
3	Scranton-Wilkes-Barre Hazleton, PA MSA	NE	13,462	5,331	2.53	152.52%	Scranton, PA; Wilkes-Barre, PA	-2,808	-5.4	4.3	610	4.5
4	Youngstown-Warren, OH MSA	MW	15,505	6,613	2.34	134.46%	Youngstown, OH; Warren, OH	-5,886	-10.3	3.6	393	2.5
5	Dayton-Springfield, OH MSA	MW	33,888	15,326	2.21	121.11%	Dayton, OH	-5,261	-7.2	3.2	716	2.1
6	Hartford, CT MSA	NE	67,227	37,660	1.79	78.51%	Hartford, CT	-6,478	-12.6	2.9	767	1.1
7	St. Louis, MO-IL MSA	MW	109,944	64,650	1.70	70.06%	St. Louis, MO	-17,855	-10.8	1.2	1,869	1.7
8	Syracuse, NY MSA	NE	16,222	9,627	1.69	68.51%	Syracuse, NY	-5,463	-8.4	3.6	627	3.9
9	Cleveland-Lorain-Elyria, OH PMSA	MW	70,718	47,376	1.49	49.27%	Cleveland, OH	-9,149	-4.6	0.7	3,173	4.5
10	Gary, IN PMSA	MW	30,304	20,375	1.49	48.73%	Gary, IN	-2,724	-6.6	-0.6	57	0.2
11	Detroit, MI PMSA	MW	170,516	115,268	1.48	47.93%	Detroit, MI	-37,629	-10.1	1.5	3,490	2.0
12	Toledo, OH MSA	MW	18,914	12,818	1.48	47.56%	Toledo, OH	-1,958	-1.5	-0.1	2,257	11.9
13	Cincinnati, OH-KY-IN PMSA	MW[33]	91,999	62,881	1.46	46.31%	Cincinnati, OH	-6,247	-4.0	2.1	3,686	4.0
14	Kansas City, MO-KS MSA	MW	108,751	78,036	1.39	39.36%	Kansas City, MO	6,374	3.6	-2.9	16,413	15.1
15	Milwaukee-Waukesha, WI PMSA	MW	69,184	49,935	1.39	38.55%	Milwaukee, WI	-8,352	-3.5	1.5	3,730	5.4
16	Akron, OH PMSA	MW	34,650	25,010	1.39	38.54%	Akron, OH	193	0.2	0.7	3,855	11.1
17	Albany-Schenectady-Troy, NY MSA	NE	25,704	19,066	1.35	34.82%	Albany, NY; Schenectady, NY	-2,895	-4.1	2.8	1,315	5.1
18	Baltimore, MD PMSA	S	123,254	93,926	1.31	31.22%	Baltimore, MD	-18,488	-6.7	5.2	1,997	1.6
19	Louisville, KY-IN PMSA	S	59,805	45,686	1.31	30.90%	Louisville, KY	-1,651	-1.5	-0.7	3,880	6.5
SECOND QUARTILE												
20	Rochester, NY MSA	NE	31,215	23,984	1.30	30.15%	Rochester, NY	-4,608	-4.9	3.4	861	2.8
21	Norfolk-Virginia Beach-Newport News, VA-NC MSA	S	86,192	66,523	1.30	29.57%	Norfolk, VA	-3,268	-3.7	-0.7	2,714	3.1
22	Springfield, MA MSA	NE	16,622	13,147	1.26	26.43%	Springfield, MA	-639	-1.1	0.8	1,151	6.9
23	Wichita, KS MSA	MW	29,854	23,912	1.25	24.85%	Wichita, KS	15,838	12.9	-0.2	16,064	53.8
24	Mobile, AL MSA	S	39,409	31,572	1.25	24.82%	Mobile, AL	3,038	4.0	0.0	5,235	13.3
25	Philadelphia, PA-NJ PMSA	NE	138,274	113,087	1.22	22.27%	Philadelphia, PA	-13,004	-2.2	0.2	4,585	3.3
26	Omaha, NE-IA MSA	MW	43,199	35,416	1.22	21.98%	Omaha, NE	22,896	17.1	-1.4	24,782	57.4
27	Indianapolis, IN MSA	MW	121,655	99,841	1.22	21.85%	Indianapolis, IN	28,161	9.6	1.6	41,209	33.9
28	Sarasota-Bradenton, FL MSA	S	55,433	45,844	1.21	20.92%	Sarasota, FL; Bradenton, FL	3,113	7.5	-1.6	4,792	8.6
29	Fresno, CA MSA	W	48,063	39,792	1.21	20.79%	Fresno, CA	18,272	15.0	0.1	21,749	45.3
30	Orlando, FL MSA	S	192,813	159,973	1.21	20.53%	Orlando, FL	15,180	23.1	-1.9	18,267	9.5
31	Knoxville, TN MSA	S	35,824	30,418	1.18	17.77%	Knoxville, TN	6,677	9.5	1.3	8,410	23.5
32	Harrisburg-Lebanon-Carlisle, PA MSA	NE	26,518	22,578	1.17	17.45%	Harrisburg, PA	-959	-4.5	3.0	318	1.2
33	Charleston-North Charleston, SC MSA	S	34,917	30,289	1.15	15.28%	Charleston, SC; North Charleston, SC	16,322	30.1	-1.2	9,150	26.2
34	Richmond-Petersburg, VA MSA	S	65,094	56,828	1.15	14.55%	Richmond, VA	-788	-0.9	-1.0	2,173	3.3
35	Columbus, OH MSA	MW	109,618	97,259	1.13	12.71%	Columbus, OH	44,538	17.3	0.3	44,472	40.6

			Metropolitan Area				Central City(s)					
Rank	Name	Region	Permits	Household Change	Ratio	Percentage Difference	Name(s)	Change in Households	% Change in Households	Vacancy % Point Change	Permits	Central city permits as a % of metro permits
36	New Orleans, LA MSA	S	36,242	32,815	1.10	10.44%	New Orleans, LA	16	0.0	-4.1	4,108	11.3
37	Washington, DC-MD-VA-WV PMSA	S	297,915	274,435	1.09	8.56%	Washington, DC	-1,296	-0.5	-0.7	2,510	0.8
38	Raleigh-Durham-Chapel Hill, NC MSA	S	132,315	122,251	1.08	8.23%	Raleigh-Durham, NC	45,766	32.3	-0.6	48,664	36.8
THIRD QUARTILE												
39	Jacksonville, FL MSA	S	88,356	82,058	1.08	7.68%	Jacksonville, FL	43,115	17.9	-1.8	50,482	57.1
40	Seattle-Bellevue-Everett, WA PMSA	W	165,970	154,260	1.08	7.59%	Seattle, WA	21,797	9.2	-0.5	24,893	15.0
41	Tampa-St. Petersburg-Clearwater, FL MSA	S	149,584	139,835	1.07	6.97%	Tampa, FL; St. Petersburg, FL	13,918	6.3	-3.6	20,396	13.6
42	Wilmington-Newark, DE-MD PMSA	S	33,187	31,272	1.06	6.12%	Wilmington, DE	61	0.2	2.4	853	2.6
43	Allentown-Bethlehem-Easton, PA MSA	NE	22,483	21,317	1.05	5.47%	Allentown, PA	-743	-1.7	2.3	498	2.2
44	Atlanta, GA MSA	S	410,774	389,530	1.05	5.45%	Atlanta, GA	12,395	8.0	-4.7	18,398	4.5
45	Greenville-Spartanburg-Anderson, SC MSA	S	60,592	57,962	1.05	4.54%	Greenville, SC; Spartanburg, SC	-442	-1.1	2.2	2,600	4.3
46	Las Vegas, NV-AZ MSA	W	262,412	251,236	1.04	4.45%	Las Vegas, NV	77,015	77.2	-1.7	83,427	31.8
47	Chicago, IL PMSA	MW	313,245	300,150	1.04	4.36%	Chicago, IL	36,754	3.6	-1.6	29,859	9.5
48	Grand Rapids-Muskegon-Holland, MI MSA	MW	64,582	62,136	1.04	3.94%	Grand Rapids, MI	4,188	6.1	-0.3	4,057	6.3
49	Portland-Vancouver, OR-WA PMSA	W	158,144	152,335	1.04	3.81%	Portland, OR	36,469	19.5	0.1	18,895	11.9
50	Vallejo-Fairfield-Napa, CA PMSA	W	21,818	21,064	1.04	3.58%	Vallejo, CA; Fairfield, CA; Napa, CA	10,727	12.4	-1.6	9,541	43.7
51	Minneapolis-St. Paul, MN-WI MSA	MW	181,936	176,445	1.03	3.11%	Minneapolis, MN	1,670	1.0	-3.2	3,769	2.1
52	Salt Lake City-Ogden, UT MSA	W	86,692	84,509	1.03	2.58%	Salt Lake City, UT	4,804	7.2	-2.4	3,942	4.5
53	Tulsa, OK MSA	S	30,736	30,213	1.02	1.73%	Tulsa, OK	10,296	6.6	-4.2	11,980	39.0
54	Greensboro-Winston-Salem-High Point, NC MSA	S	81,742	80,502	1.02	1.54%	Greensboro, NC; Winston-Salem, NC	33,817	25.1	-0.4	20,533	25.1
55	Nashville, TN MSA	S	100,012	100,284	1.00	-0.27%	Nashville-Davidson, TN	28,818	14.5	-3.3	28,272	28.3
56	Newark, NJ PMSA	NE	42,812	43,030	0.99	-0.51%	Newark, NJ	-170	-0.2	-1.9	3,981	9.3
FOURTH QUARTILE												
57	Ann Arbor, MI PMSA	MW	41,281	41,591	0.99	-0.75%	Ann Arbor, MI	4,036	9.7	-2.1	3,323	8.0
58	Sacramento, CA PMSA	W	99,150	100,447	0.99	-1.29%	Sacramento, CA	10,137	7.0	-0.1	8,103	8.2
59	Monmouth-Ocean, NJ PMSA	NE	58,099	58,921	0.99	-1.40%	Dover Township, NJ	6,153	22.5	-4.8	5,131	8.8
60	Dallas, TX PMSA	S	250,028	254,711	0.98	-1.84%	Dallas, TX	49,773	12.4	-7.0	46,622	18.6
61	Houston, TX PMSA	S	179,825	183,772	0.98	-2.15%	Houston, TX	101,068	16.4	-6.9	65,079	36.2
62	Baton Rouge, LA MSA	S	18,361	18,802	0.98	-2.35%	Baton Rouge, LA	5,633	6.8	-5.5	3,435	18.7
63	Riverside-San Bernardino, CA PMSA	W	163,881	168,008	0.98	-2.46%	Riverside, CA; San Bernardino, CA	8,390	6.5	0.9	10,850	6.6
64	Columbia, SC MSA	S	37,670	40,118	0.94	-6.10%	Columbia, SC	8,326	24.5	0.3	4,467	11.9
65	Phoenix-Mesa, AZ MSA	W	325,990	347,536	0.94	-6.20%	Phoenix, AZ	95,913	25.9	-6.3	80,577	24.7
66	Oklahoma City, OK MSA	S	40,605	44,150	0.92	-8.03%	Oklahoma City, OK	25,772	14.4	-5.5	21,979	54.1
67	Little Rock-North Little Rock, AR MSA	S	23,956	26,686	0.90	-10.23%	Little Rock, AR	4,779	6.6	-1.6	8,314	34.7
68	Providence-Fall River-Warwick, RI-MA MSA	NE	41,559	46,716	0.89	-11.04%	Providence, RI	3,484	5.9	-3.7	911	2.2
69	Boston, MA-NH PMSA	NE	138,245	156,258	0.88	-11.53%	Boston, MA	11,064	4.8	-4.0	3,848	2.8
70	Oakland, CA PMSA	W	77,057	87,689	0.88	-12.12%	Oakland, CA	6,269	4.3	-2.3	4,383	5.7

Rank	Metropolitan Area Name	Region	Permits	Household Change	Ratio	Percentage Difference	Central City(s) Name(s)	Change in Households	% Change in Households	Vacancy % Point Change	Permits	Central city permits as a % of metro permits
71	Denver, CO PMSA	W	150,117	175,887	0.85	-14.65%	Denver, CO	28,283	13.4	-7.1	16,505	11.0
72	Austin-San Marcos, TX MSA	S	106,422	125,879	0.85	-15.46%	Austin, TX	73,501	38.3	-7.4	51,231	48.1
73	San Antonio, TX MSA	S	69,238	89,650	0.77	-22.77%	San Antonio, TX	78,713	24.1	-4.2	52,199	75.4
74	San Francisco, CA PMSA	W	29,879	41,949	0.71	-28.77%	San Francisco, CA	24,116	7.9	-2.1	13,280	44.4

Endnotes

1. Thomas Bier is executive in residence and Charlie Post is project manager at the Center for Housing Research and Policy, Maxine Goodman Levin College of Urban Affairs, Cleveland State University.

2. Bruce Katz and Robert E. Lang, *Redefining Urban & Suburban America: Evidence from Census 2000*. Volume 1. (Washington: Brookings Press, 2003).

3. Paul A. Jargowsky, "Stunning Progress, Hidden Problems: The Dramatic Decline of Concentrated Poverty in the 1990s," (Washington: Brookings, 2003).

4. For example: Richard Ratcliff, Urban Land Economics (London: McGraw-Hill, 1949); Ira Lowry, "Filtering and Housing Standards: A Conceptual Analysis," *Land Economics,* 36(4), 1960: 362–370; William Grigsby, *Housing Markets and Public Policy* (Philadelphia: University of Pennsylvania Press, 1963).

5. For examples of recent movement patterns, see Thomas Bier, "Moving Up, Filtering Down: Metropolitan Housing Dynamics and Public Policy," (Washington: Brookings, 2001).

6. William Grigsby, *Housing Markets and Public Policy* (Philadelphia: University of Pennsylvania Press, 1963) p. 107.

7. Alan Berube, "Racial Change in the Nation's Largest Cities: Evidence from the 2000 Census," (Washington: Brookings, 2001).

8. U.S. Bureau of Census, "Current Construction Reports," Series C-40; and for households, U.S. Bureau of Census, "Census of Population and Housing 1980, 1990 and 2000."

9. One important reason these are excluded is because data on units removed from the housing stock are generally not very reliable. And as the National Association of Home Builders points out, "a direct source of data for removals is not available." Drew A. Mitchum, "Housing Removal Rates," *Housing Economics, National Association of Home Builders,* February 2003, p.13.

10. Barry Edmonston, "The 2000 Census Challenge," Population Reference Bureau *Reports on America,* February 1999, pp. 1–18.

11. Units abandoned during the decade were estimated to be the change in the number of units between 1990 and 2000 plus the number vacant in 2000 that exceeded an assumed normal vacancy rate of 3 percent.

12. Metropolitan areas omitted from the analysis include: Albuquerque, Bakersfield, Bergen-Passaic, Birmingham, Colorado Springs, El Paso, Fort Lauderdale, Fort Worth-Arlington, Honolulu, Jersey City, Los Angeles-Long Beach, McAllen-Edinburg-Mission, Miami, Nassau-Suffolk, New Haven-Meriden, New York, Orange County, San Diego, San Jose, Stockton-Lodi, Tacoma, Tucson, Ventura, and West Palm Beach-Boca Raton.

13. One or more counties were dropped from the analysis of seven metro areas: Atlanta, Cincinnati, Dallas, Houston, Kansas City, St. Louis and Washington DC.

14. See also: Dowell Myers and Julie Park, "The Great Housing Collapse in California," (Washington Fannie Mae Foundation, 2002).

15. U.S. Bureau of Census, "Census of Population and Housing 1990 and 2000." Calculations by the authors.

16. William H. Lucy and David L. Phillips, "Suburbs and the Census: Patterns of Growth and Decline," (Washington: Brookings, 2001).

17. For a detailed discussion of these places, see Robert Puentes and Myron Orfield, "Valuing America's First Suburbs: A Policy Agenda for Older Suburbs in the Midwest," (Washington: Brookings, 2002).

18. Thomas Bier, "Moving Up, Filtering Down: Metropolitan Housing Dynamics and Public Policy," (Washington: Brookings, 2001).

19. Thomas Bier and Steven R. Howe, "Dynamics of Suburbanization in Ohio Metropolitan Areas," Urban Geography, 1998, 19(8), pp. 695-713.

20. This is a particular problem for slow-growing metropolitan areas such as Philadelphia, St. Louis, Detroit, Milwaukee and Pittsburgh which all either grew very slowly or not at all in terms of population in the 1990s, but continued to develop land on the fringe. See William Fulton, Rolf Pendall, Mai Nguyan and Alicia Harrison, "Who Sprawls Most? How Growth Patterns Differ Across the U.S.," (Washington: Brookings, 2001.)

21. Rebecca R. Sohmer and Robert E. Lang, "Downtown Rebound," (Washington: Fannie Mae Foundation and Brookings, 2001).

22. Brian J.L. Berry, "Islands of Renewal in Seas of Decay," in *The New Urban Reality,* Paul E. Peterson, ed., (Washington.: Brookings, 1985).

23. Alan Berube and Benjamin Forman, "Living on the Edge: Decentralization Within Cities in the 1990s," (Washington: Brookings, 2002).

24. The method for determining the city's share of new housing that would have been needed in the 1990s to produce zero household loss is as follows:, the number of households actually lost by the city in the 1990s was added to the number of city building permits; the resultant number, divided by the total area permits (times 100) gives the city's "needed" share. This method assumes the total metropolitan permits to be constant (that is, the city's increase in permits results in an equal decrease in the suburban portion of the area). If the total is not constant, if a city's new housing simply increases the area total, then the city cannot reduce its household loss.

25. The article points out that housing is not undersupplied "equally throughout the nation. The undersupply problem is most acute along the east and west coast." See Robert E. Lang, "Is the United States Undersupplying Housing?" Washington: Fannie Mae Foundation, *Housing Facts & Findings,* v. 4 no. 2.

26. See: Myron Orfield, *Metropolitics: A Regional Agenda for Community and Stability,* (Washington.: Brookings, 1997).

27. Oregon Department of Land Conservation and Development, "Oregon's Statewide Planning Goals & Guidelines. Goal 14: Urbanization," OAR 660-015-0000(14). (2000). **http://www.lcd.state.or.us**.

28. Critics of Oregon's urban growth boundary claim it has caused home prices to be higher than they otherwise would be. If that has been the result, the increase, relative to other cities, has not been large enough to confirm that position. See Anthony Downs, Arthur C. Nelson, and William A. Fischel, "Have Housing Prices Risen Faster in Portland Than Elsewhere?" *Housing Policy Debate* (2002), 13 (1), pp. 7–50.

29. Household loss is not necessarily a serious negative for a city as it can result in a more comfortable population density. However, typically cities lose mainly their stronger income residents and do not produce sufficient redevelopment to compensate for the loss.

30. For example, C. Theodore Koebel, "Urban Redevelopment, Displacement and the Future of the American City," (Federal Reserve Bank of Richmond, 1996) and "Developing Infill Housing in Inner-City Neighborhoods, " (Washington: Urban Land Institute, 1997).

31. Jodi Wilgoren, "Detroit Urban Renewal Without the Renewal," *New York Times,* July 7, 2002, p. A9.

32. The correlation between percent change in the number of households in the 74 metropolitan areas and percent change in employment between 1990–1999 was 0.91303, a strong positive correlation. As expected, the more employment grew, the more households grew. The correlation between the ratio for the 1990s and the percent change in employment was -0.41595, a moderate negative correlation. That is, the higher the ratio, the less employment grew.

33. The Cincinnati PMSA is actually located in both the Midwestern (Ohio) and the Southern (Kentucky) regions. However, since the central city is located in the Midwest, that is how it was categorized for this paper.

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