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Tracking and Explaining Neighborhood Socio- Economic Change in U.S. Metropolitan Areas between 1990 and 2010

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City living is back. After half a century of relentless population decline and several false starts at revitalization, residential investment in America's urban centers began to pick up in the mid- 1990s. In the ten years between the 2000 and 2010 decennial censuses, the housing stock in America's 50 largest central cities grew by 1.5 million dwelling units, or 8.3% percent.¹ As the Environmental Protection Agency has documented in a series of reports, this "back-to-the-city" construction trend continued even through the Great Recession.

Multiple factors underlie this boomlet. Members of the millennial generation (those born between 1982 and 2004) proved themselves less interested than prior generations in getting married, having children, and moving to the suburbs. Urban crime rates fell significantly. Suburban highways became as congested as their urban counterparts. Pushed by successive presidential administrations and Congress, low-cost mortgage money grew more available to moderate-income and minority residents of older neighborhoods, enabling many of them to become homeowners. Between 2000 and 2008, the number of homeowners in America's 50 largest central cities rose by 0.6 million, pushing the homeownership rate to an all-time high of just under fifty percent.

Not everyone greeted these changes favorably. Newspaper articles appeared in city after city citing the rising incidence of gentrification—a form of neighborhood change wherein developers and higher-income households buy-up residential properties in low-income neighborhoods for the purpose of inhabiting them, upgrading them, renting them out at a higher rent, or, in some cases, just flipping them.² The purported end result is the displacement of long-time and usually poorer residents.

Residential upgrading was hardly limited to urban cores. Homebuilders were also hard at work in suburban communities and at the peri-urban edge building millions of large single-family homes. These "McMansions" as they were known, were typically larger than 3,000 square feet and included garage space for three cars. Just as urban upgrading was drawing popular criticism as gentrification, suburban upgrading was drawing comparable attacks for being unsustainable and contributing to sprawl.

Of course, not everyone was lucky enough to live in an improving or even stable neighborhood. Behind the newspaper headlines and websites protesting gentrification and McMansion development, large numbers of urban and suburban residents continued living in neighborhoods where public and private investment had failed to keep pace with the ravages of time, depopulation, or economic decline. Not until the subprime mortgage bubble finally popped in 2008 did the vulnerability of both urban and suburban neighborhoods to macro-economic and forces and financial policies finally become clear.

Planners and urban analysts have had a tough time getting their heads around these changes. With a few exceptions (Lucy and Phillips 2006, Berube and Kneebone 2009, Kneebone and Berube 2013), planners' understanding of neighborhood change has occurred in the absence of a comprehensive analysis that includes cities and suburbs and neighborhood upgrading and neighborhood decline. This is understandable: with 360+ metropolitan areas, each with its own core areas and suburbs, and most experiencing some combination of upgrading and decline, the set of neighborhood change possibilities is mind-boggling. The format in which the Census Bureau publishes its data also presents challenges. Census tracts are a good approximation of neighborhoods but they are only an approximation, and don't map particularly well to how residents perceive their actual neighborhoods.

This article takes up the challenge of trying to consistently identify the extent and spatial incidence of gentrification and other forms of substantial neighborhood socio-economic change among large U.S. metropolitan areas between 1990 and 2010. As such, it seeks to answer four related questions about neighborhood change processes and outcomes:

¹ This includes the cities of Baltimore, Detroit, New Orleans, and St. Louis, all of which lost significant population during the 2000 to 2010 period.

² A quick Google search of news articles mentioning gentrification found over 6,600 articles during March 2014 alone.



1. How easily can commonly-available census data be used to robustly measure gentrification and other types of neighborhood socio-economic change across all U.S. metropolitan areas?

This article demonstrates the use of the 3-D Double Decimal Difference method to identify neighborhoods that experienced substantial upgrading or decline between 1990 and 2010. This method categorizes census tracts according to whether they experienced a two-or-more-decile change in median household income between 1990 and 2010. Gentrification is a special case of upgrading in which a neighborhood starts out in 1990 in the first, second, third or fourth income decile. A two-or-more decile *upward* shift constitutes substantial upgrading. A two-or-more decile *downward* shift constitutes substantial decline. The 3-D method works equally well for core area and suburban neighborhoods.

Applying the 3-D method to the 70 largest U.S. metro areas reveals that decline not upgrading was the dominant form of neighborhood socio-economic change between 1990 and 2010. As of 1990, roughly 20% of the residents of these large metro areas lived census tracts that would subsequently decline. By contrast, only 6% lived in tracts that subsequently upgrade, and only 3% lived in pre-gentrifying neighborhoods.

Exhibits 1 and 2 go beyond these national percentages to focus on individual metro areas. Metros are ranked both by the number of residents living within each neighborhood category (Exhibit 1) and by the share of residents in each category (Exhibit 2).

The raw number rankings in Exhibit 1 are dominated by a few large metropolitan areas: Los Angeles, the San Francisco Bay Area, and Chicago. As of 1990, Los Angeles was home to the largest number of core area residents of future upgrading, future gentrifying, and future declining census tracts. It was also home to the largest number of suburban residents of future upgrading and gentrifying tracts. The San Francisco Bay area came in second behind Los Angeles in the number of residents of future core area and suburban upgrading tracts, second in the number of residents of future gentrifying suburban tracts, third in the number of residents of gentrifying core area tracts, and fourth in the number of residents of declining core area tracts. Chicago topped the rankings in the number of residents of declining suburban tracts, came in second in the number of residents of core area gentrifying tracts, and third in the number of residents of core area upgrading tracts. There were relatively few suburban Chicago residents, by contrast, living in suburban tracts which would undergo upgrading or gentrification.

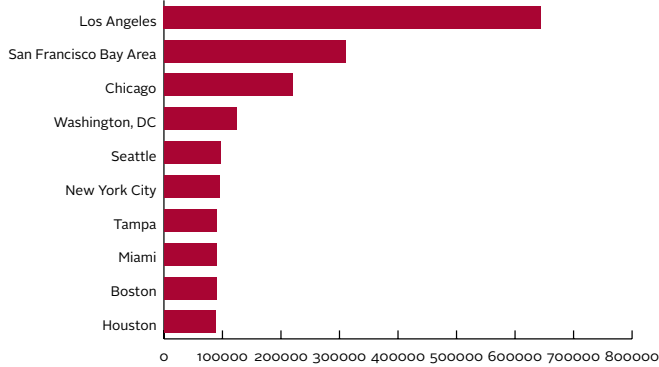
Size isn't everything: the nation's largest metro area, New York City came in only sixth in terms of the number of core area residents of future upgrading neighborhoods (behind Washington, D.C. and Seattle) and in tenth place in its number of core area residents of gentrifying neighborhoods. Seattle, despite being smaller than New York, Los Angeles, and Chicago, was among the most active metro areas in terms of neighborhood upgrading and gentrification. In raw number terms, Seattle was third in the number of suburban residents of gentrifying census tracts, fourth in suburban upgrading, fifth in core area upgrading, and tenth in core area gentrification. Tampa, and to a lesser extent, Miami-Ft. Lauderdale, had comparable upgrading experiences to Seattle, although Miami-Ft. Lauderdale also experienced substantial core area and suburban decline. Other metro areas that experienced substantial absolute levels of core area upgrading and gentrification included Boston, Houston, and Dallas-Fort Worth. Among the metropolitan areas whose core experienced significant decline were three rustbelt metros (Pittsburgh, St. Louis and Baltimore), and two Sunbelt metros (Las Vegas) whose economies were hard hit by the collapse of the housing market in 2008. Metros whose suburban neighborhoods prospered at the apparent expense of their core areas included Detroit,



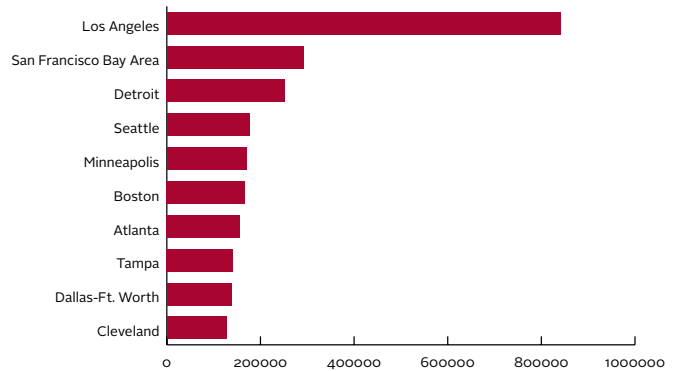
EXHIBIT 1:

Top 10 U.S. Metro Areas Ranked by Number of 1990 Residents of Upgrading, Gentrifying, and Declining Census Tracts

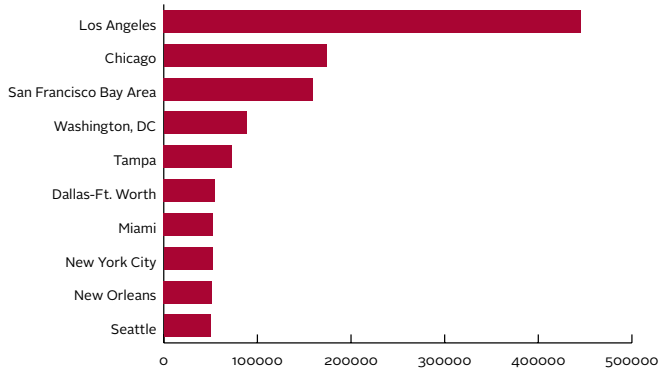
1990 CORE AREA RESIDENTS IN UPGRADING TRACTS



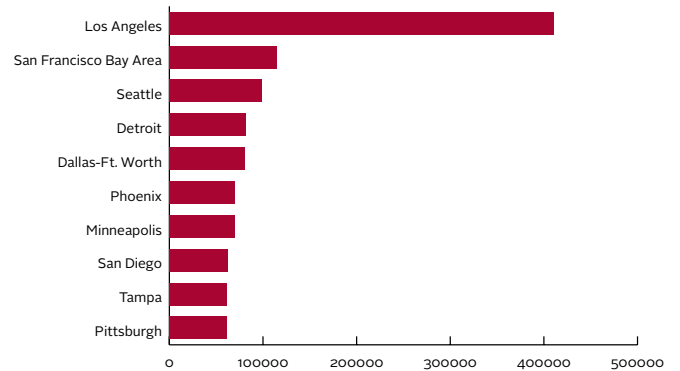
1990 SUBURBAN RESIDENTS IN UPGRADING TRACTS



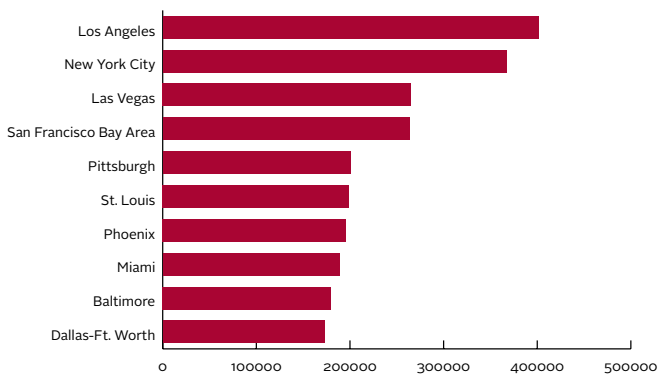
1990 CORE AREA RESIDENTS IN GENTRIFYING TRACTS



1990 SUBURBAN RESIDENTS IN GENTRIFICATION TRACTS



1990 CORE AREA RESIDENTS IN DECLINING TRACTS



1990 SUBURBAN RESIDENTS IN DECLINING TRACTS

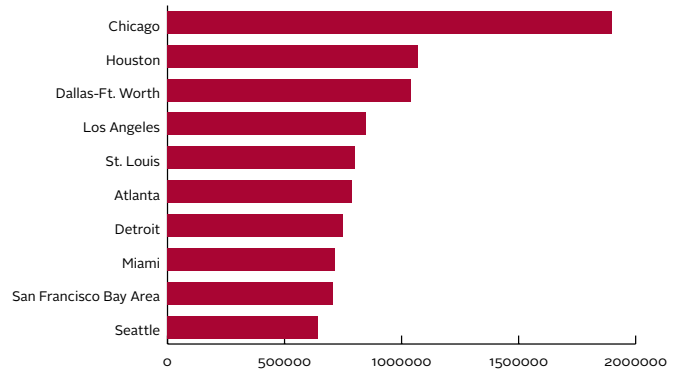
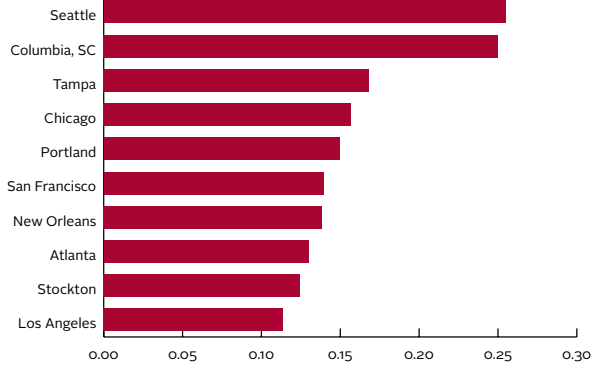




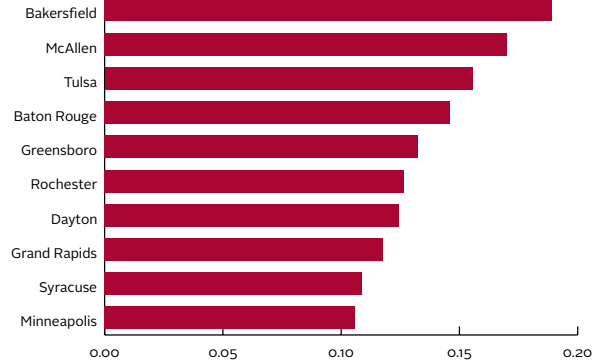
EXHIBIT 2

Top 10 U.S. Metropolitan Areas by Share of 1990 Urban and Suburban Residents of Upgrading, Gentrifying, and Declining Census Tracts

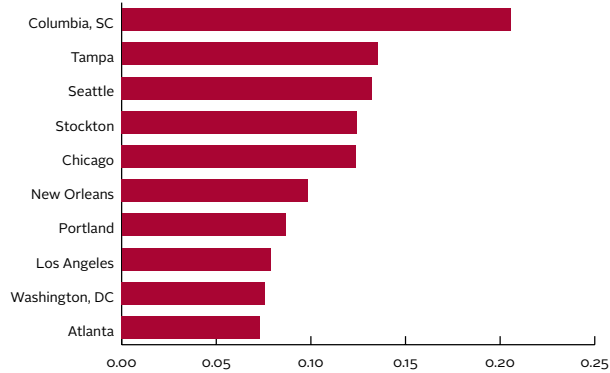
PCT. OF 1990 CORE AREA RESIDENTS LIVING IN UPGRADING TRACTS



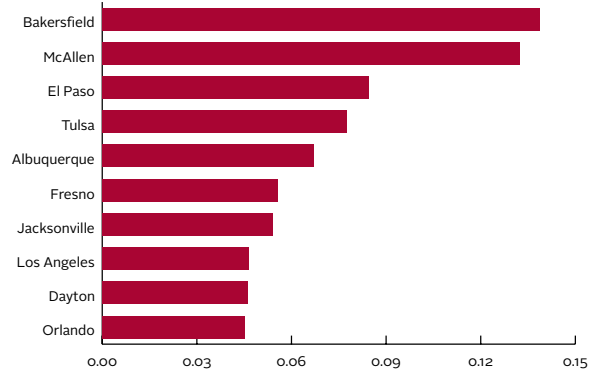
PCT. OF 1990 SUBURBAN RESIDENTS LIVING IN UPGRADING TRACTS



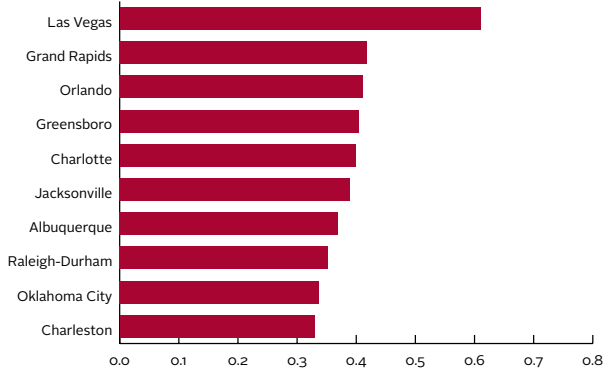
PCT. OF 1990 CORE AREA RESIDENTS LIVING IN GENTRIFYING TRACTS



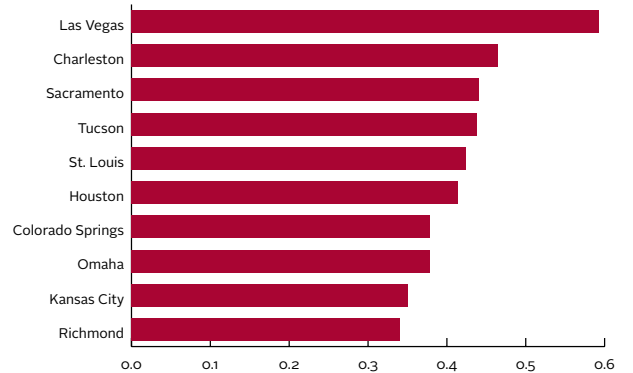
PCT. OF 1990 SUBURBAN RESIDENTS LIVING IN GENTRIFYING TRACTS



PCT. OF 1990 CORE AREA RESIDENTS LIVING IN DECLINING TRACTS



PCT. OF 1990 SUBURBAN RESIDENTS LIVING IN DECLINING TRACTS





Atlanta, Cleveland and Pittsburgh. Atlanta was also among the leading suburban decliners, along with St. Louis, Dallas-Ft. Worth, and Houston.

Exhibit 2, which scales these changes by total population, offers a number of surprises. In addition to the usual suspects like Seattle, the San Francisco Bay Area, and Los Angeles, the list of top upgrading and gentrification metros includes less talked about metros such as Columbia (South Carolina), Tampa, Portland, and Atlanta. Also surprising is the fact that the list of big decliners is dominated not by rustbelt metros like Detroit or St. Louis, but by Sunbelt metros like Las Vegas, Orlando, Charlotte, and Albuquerque. These Sunbelt metros benefited from the ready available of inexpensive mortgage credit during the early 2000s, but also suffered greatly in the aftermath of the Great Recession.

2. To what degree are neighborhood –level socio-economic changes principally the result of metropolitan-scale factors (such as regional population growth and/or densities) versus more “bottom-up” factors?

As indicated in Exhibit 3, metropolitan-scale factors play a small role in affecting neighborhood change. Overall, they have a bigger effect on suburban neighborhoods than on core areas, and correlate better with decline than with neighborhood upgrading. Among suburban areas, just two metro-scale variables, the share of households with children, and lower core area densities, explained 28% of suburban upgrading between 1990 and 2000, and nearly half of suburban gentrification activity.

Suburban decline, by contrast, was greater in metros with higher population growth rates and proportionately more immigrants. Higher metropolitan growth rates were also strongly correlated with core area decline.

The effect of metropolitan-scale factors on core area upgrading was more modest, accounting for just 19% of upgrading and gentrification activity between 1990 and 2000. Except for the presence of an urban growth boundary, no metro-scale socio-economic or growth factors were associated with core area upgrading activity. The presence of a growth-limiting boundary was also correlated with greater gentrification activity, as was the initial presence of a higher proportion of non-whites.

Taken together, these results suggest that too much population growth at the metropolitan scale serves to destabilize neighborhoods, while the presence of an urban growth boundary acts as a stabilizing force, especially in core areas. Density, however, is a two-edged sword: higher densities encourage gentrification activity in core areas while discouraging it in suburban neighborhoods.

3. To what degree are neighborhood-level socio-economic changes shaped by the characteristics of individuals and groups (including residents, property-owners, and developers) operating at the neighborhood level?

Like metro-scale factors, neighborhood-scale factors do a better job explaining neighborhood decline than neighborhood upgrading (Exhibit 4). Among suburban tracts, a combination of local factors serve to correctly identify 58% of suburban tracts that experienced substantial socio-economic decline between 1990 and 2000. The suburban tracts most likely to decline were those with higher rents and lower home values. Similar factors accounted for core area decline. Racial composition played a relatively minor role in predicting suburban decline and almost no role in explaining core area decline. Core area tracts located near their CBDs were less likely to have declined.



EXHIBIT 3A

Stepwise Regression Results Comparing Metro-level Factors with 1990-2010 CORE AREA Neighborhood Change

	Metro-level Factors Associated with Larger Shares of 1990 Core Area Residents Living in Upgrading Census Tracts	Metro-level Factors Associated with Larger Shares of 1990 Core Area Residents Living in Gentrifying Census Tracts	Metro-level Factors Associated with Larger Shares of 1990 Core Area Residents Living in Declining Census Tracts
Most important factor	[+] Presence of Urban Containment Boundary	[+] Presence of Urban Containment Boundary	[+] Pct. Metro Population Change, 1990–2010
2nd most important factor		[-] White Population Share, 1990	[-] 1990 Core Area Population Density
3rd most important factor			[-] Median Income, 1990
r-squared	0.19	0.19	0.44
Observations	68	68	68

EXHIBIT 3B

Stepwise Regression Results Comparing Metro-level Factors with 1990-2010 SUBURBAN Neighborhood Change

	Metro-level Factors Associated with Larger Shares of 1990 Suburban Residents Living in Upgrading Census Tracts	Metro-level Factors Associated with Larger Shares of 1990 Suburban Residents Living in Gentrifying Census Tracts	Metro-level Factors Associated with Larger Shares of 1990 Suburban Residents Living in Declining Census Tracts
Most important factor	[-] 1990 Core Area Population Density	[+] 1990 Share of Households with Children	[+] Pct. Metro Population Change, 1990-2010
2nd most important factor	[+] 1990 Share of Households with Children	[-] 1990 Core Area Population Density	[-] Percent Foreign-born population, 1990
r-squared	0.28	0.44	0.31
Observations	68	68	68

Upgrading patterns are harder to explain. Among core areas, the principal local factors associated with neighborhood upgrading between 1990 and 2010 were low initial incomes, high initial rents, and higher proportions of white and college-educated residents. The presence of an older housing stock also contributed to the likelihood of neighborhood upgrading. The same local factors also helped explain gentrification activity. The presence of less (or more) African-American and Hispanic residents did not seem to affect the likelihood that a neighborhood would be upgraded or gentrify. While each of these factors was found to be statistically significant, collectively, they could explain only 12% of core area upgrading activity, and just 3% of neighborhood gentrification. Neighborhood upgrading is thus a more ad hoc and idiosyncratic process than neighborhood decline.

In suburban neighborhoods, upgrading and gentrification activity were most closely associated with a high proportion of white residents, higher home values, and low initial incomes. After controlling for the share of whites, the proportion of African-American and Hispanic residents did not seem to affect the probability that a suburban tract would be upgraded or gentrify.



EXHIBIT 4A

Logit Model Results Comparing CORE AREA Tract Outcomes with Initial Tract Characteristics

Outcome Measure ▶	Probability of CORE AREA Tract Upgrading, 1990–2010	Probability of CORE AREA Tract Gentrification, 1990–2010	Probability of CORE AREA Tract Decline, 1990–2010
▼ 1990 tract-level factors associated with outcome ▼			
Most powerful predictive factor	[-] Relative Tract Income	[+] Median Rent	[-] Relative Tract Income
2nd most powerful predictive factor	[+] Median Rent	[-] Relative Tract Income	[+] Distance to Downtown
3rd most powerful predictive factor	[+] Pct. College-educated	[+] Pct. White Population	[+] Pct. One-family Homes
4th most powerful predictive factor	[+] Pct. White Population	[+] Pct. College-educated	East-West Location compared to Downtown
5th most powerful predictive factor	[+] Pct Dwellings > 40 years old	[+] Pct Dwellings > 40 years old	[-] Pct of Population in Poverty
Cases (tracts)	760	583	797
Pct. Correct Predictions	12%	3%	41%

[-] indicates negative effect; [+] indicates positive effect

EXHIBIT 4B

Logit Model Results Comparing SUBURBAN Tract Outcomes with Initial Tract Characteristics

Outcome Measure ▶	Probability of SUBURBAN Tract Upgrading, 1990–2010	Probability of SUBURBAN Tract Gentrification, 1990–2010	Probability of SUBURBAN Tract Decline, 1990–2010
▼ 1990 tract-level factors associated with outcome ▼			
Most powerful predictive factor	[-] Relative Tract Income	[-] Relative Tract Income	[+] Relative Tract Income
2nd most powerful predictive factor	[+] Median Home Value	[+] Pct. White Population	[+] Median Rent
3rd most powerful predictive factor	[+] Pct. White Population	[+] Median Home Value	[-] Median Home Value
4th most powerful predictive factor	[-] Population Density	[-] Pct. Multi-family Dwelling Units	[-] Pct. Poverty Population
5th most powerful predictive factor	[-] Pct Multi-family Dwelling Units	[+] Pct. One-family Dwelling Units	[+] Pct. Multi-family Dwelling Units
Cases (tracts)	1,129	529	1,182
Pct. Correct Prediction	11%	11%	58%

[-] indicates negative effect; [+] indicates positive effect



4. To what extent are gentrification and other forms of neighborhood change always accompanied by turnover and displacement?

Turnover and displacement are not the same thing, although they usually track together. Turnover includes both voluntary and involuntary moves whereas displacement is inherently involuntary. Measured at the census tract level, turnover rates in 2010 were slightly higher in declining tracts than in upgrading or gentrifying tracts. Further controlling for the socio-economic composition of the neighborhood causes the connection between recent turnover rates and neighborhood change to disappear altogether. This is not to say that neighborhood upgrading and decline can't or doesn't generate displacement in particular neighborhoods, but it does suggest that the relationship is not a systematic or widespread one.

What do these results mean for community and regional planners? The key takeaway of this research is that the media's current fascination with gentrification notwithstanding, it is neighborhood decline—in both cities and suburbs—that remains the dominant form of neighborhood change, and the one that local urban development programs should continue to focus on.

Center city planners seeking to reverse neighborhood decline and promote upgrading should focus their efforts on older and walkable neighborhoods with diverse and aspirational populations. Those hoping to anticipate and stem decline should keep a close eye on more distant neighborhoods, those with proportionately more multi-family housing, and those with large populations already in poverty. They should also be aware that while decline is spatially contagious—that is, it tends to spillover from one neighborhood to another—upgrading is not.

Other than the fact that gentrification starts from a lower point on the income scale, there are few structural differences between upgrading and gentrification. This suggests that instead of trying to limit upgrading as a means of deterring gentrification, local planners are better off trying to redistribute the benefits of upgrading. This can be done by enacting circuit breaker mechanisms to limit the effects of rising property taxes on long-time or low-income homeowners; by directing housing vouchers toward long-time-low-income renters; or by imposing sizable transfer taxes on short-term property flippers and speculators.

Suburban planners seeking to promote neighborhood upgrading or reinvestment should focus their efforts on older, moderate-density neighborhoods with higher rates of owner-occupancy and a history of stable property values. As in central cities, the focus of suburban upgrading programs should not be to stop gentrification, per se, but to safeguard long-time residents from rapidly rising home prices and rents. And where possible, to insure that at least some of the increases in local tax revenues generated by neighborhood upgrading is directed back to lower-income residents. In terms of heading-off future decline, suburban planners should focus their efforts on racially diverse neighborhoods and neighborhoods with a higher proportion of multi-family homes. Neighborhoods with these two characteristics are generally more vulnerable to disinvestment.

In those regions where that metropolitan policymakers have a responsibility to promote neighborhood upgrading or combat neighborhood decline, they should focus on limiting suburban sprawl, on attracting immigrant households and households with children to suburban communities, and on trying to regularize the rate of metropolitan growth. These efforts will have small but noticeable effects on stabilizing both core area and suburban neighborhoods.



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