Mapping Over Two Decades of Neighborhood Change in the Boston Metropolitan Area

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The cities, towns, and neighborhoods that together make up greater Boston have changed significantly in the last few decades. Between 1990 and 2016, the region has become more affluent and more ethnically and racially diverse. However, during this same period, increases in house prices and rents outpaced the growth in many residents' incomes. Moreover, while many of these changes have occurred throughout the region, the pace and nature of change has been uneven across the region's cities, towns and neighborhoods. As a result, like the nation as a whole, the region is also becoming increasingly unequal and marked by growing concentrations of poverty and affluence.

This policy brief, which is being released in conjunction with a new mapping tool developed by the Joint Center for Housing Studies, uses data from the 1990 and 2000 decennial census surveys as well as the Census Bureau's American Community Survey (ACS) 5-Year Estimates from 2006–2010 and 2011–2016 (hereafter referred to as 2010 and 2016) to document a variety of changes in the 1,003 census tracts—small areas delineated by the Census Bureau that serve as statistical approximations of neighborhoods—that together make up the Boston–Cambridge–Newton, MA–NH Metropolitan Statistical Area (MSA).[1] This area not only covers Boston and nearby cities and towns but also stretches north to parts of southern New Hampshire, west to some of central Massachusetts, and south towards (but not into) Cape Cod and Massachusetts' South Coast cities. It is home to about 4.7 million people, which makes it the nation's 10th largest MSA.

In particular, in the sections that follow, the brief highlights and describes the following six notable changes that have occurred in greater Boston:

- Growing Racial and Ethnic Diversity but Continued Isolation within the Region;
- Increased Affluence but Rising Levels of Income Inequality;
- Somewhat More Concentrated Poverty;
- Declining Amounts of Modest-Cost Housing;
- Rising Numbers of Cost-Burdened Renters and Homeowners; and
- Gentrification or Stagnation in Low-Income Tracts.

1. Growing Racial and Ethnic Diversity

Between 1990 and 2016, greater Boston became more racially and ethnically diverse. Most notably:

- While the region's total population grew from 4.1 million people in 1990 to 4.7 million in 2016 (an increase of 14 percent), the non-Hispanic white population declined by more than 160,000 people (a 5 percent decrease). However, the region's minority population – defined as non-Hispanic blacks, Hispanics of any race, Asians, and other non-whites – grew by 760,000 (an increase of 140 percent). As a result, the share of the metro area's population that is minority more than doubled from 13 to 28 percent between 1990 and 2016. Still, the minority share of the population in the Boston metro is lower than that of the nation as a whole, where the minority share of the population rose from 24 to 38 percent over this period.
- Between 1990 and 2016, the region's Hispanic population increased two-and-a-half fold, rising from 190,000 people in 1990 to 485,000 in 2016, an increase of 295,000 people.
- In contrast, the non-Hispanic black population grew but by a more modest 58 percent between 1990 and 2016 (125,000 people). As a result of this slower growth, blacks went from being the most populous minority group in 1990 to the least populous in 2016, even as the black population grew from 216,000 to 341,000 persons.

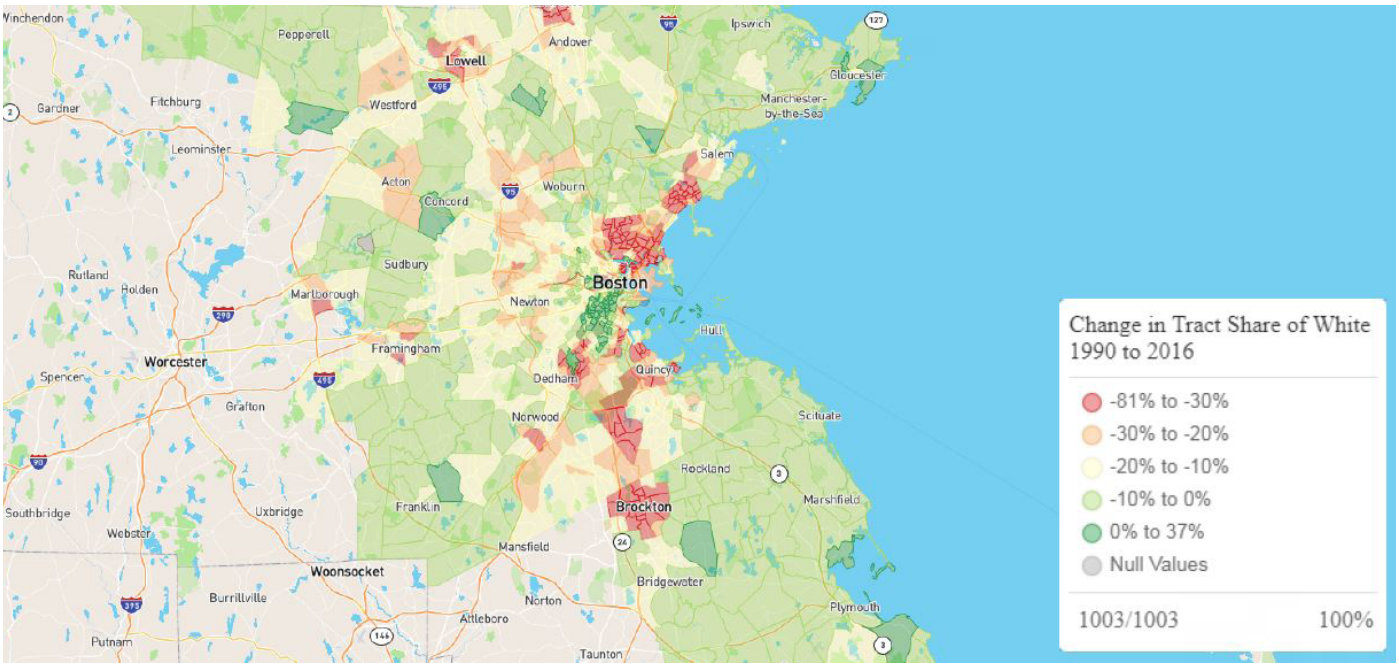
- The largest increase in the region's minority population was among the region's Asian/other minority population, which rose from 138,000 people in 1990 to 477,000 in 2016, an increase of nearly 250 percent (339,000 people).

While significant changes occurred throughout the region's cities and towns, the nature and magnitude of those changes varied widely:

- In 1990, 45 percent of the Boston metro area's census tracts had a population that was at least 95 percent white. By 2016, the share of census tracts where this was true had fallen to 11 percent. Moreover, the share of tracts where 80 percent or more of the population was white dropped from 80 percent in 1990 to 50 percent in 2016 (**Map 1**).
- The number of majority-minority census tracts—places where more than 50 percent of the population identified as black, Hispanic, or Asian/other—more than doubled from 74 in 1990 to 187 in 2016. These now comprise 19 percent of the metro area's tracts.
- The share of the minority population grew in nearly 94 percent of the Boston metro area's census tracts. In many locales, particularly in the suburbs, increased diversity was mainly due to substantial growth in the Asian/other population, which consists primarily of people of Asian descent. Overall, the share of Asians grew in 95 percent of the region's census tracts between 1990 and 2016. Particularly rapid growth occurred in areas with historically high Asian populations, such as Quincy, where the Asian population grew from 5,700 persons in 1990 to 28,500 in 2016, and in suburban locales that had small Asian populations in 1990. The Asian population in Acton, for example, grew from under 700 in 1990 to 5,800 persons in 2016, while in Malden the Asian population increased from 2,900 to 16,400. Where Asians/others made up 30 percent of the population in only 7 tracts in 1990 (3 of them near Boston's historic Chinatown, 2 in Dorchester and 2 in Lowell), in 2016, Asians/others made up 30 percent of the population in 41 tracts, including 11 in Boston, 10 in Quincy, as well as in parts of such suburban communities as Acton, Lexington, Brookline and Malden.
- While the share of the population that is Hispanic increased in 86 percent of Boston metro tracts, the bulk of growth was limited to a few neighborhoods and locales. The Hispanic populations in East Boston (which is part of the city of Boston) grew from 5,800 persons in 1990 to 26,700 persons in 2016. The Hispanic population also more than doubled in the cities of Chelsea, Revere, Lynn, and Lawrence. Moreover, these four cities, along with East Boston, accounted for 37 percent of the region's growth in Hispanics between 1990 and 2016. As a result, they were home to one third (34 percent) of the metro area's Hispanic population in 2016, up from 28 percent in 1990.
- The non-Hispanic black share of population grew in 60 percent of the region's tracts, but more than half the total growth occurred in just 39 tracts where the black share of the population grew by at least 20 percentage points. These tracts included 14 of the 167 tracts in the city of Boston (mainly in parts of Dorchester, Roxbury, and Hyde Park, but also in West Roxbury, Jamaica Plain, and South Boston). Another 17 tracts were in Brockton (which has 21 total tracts), five were in Randolph (which only has five tracts); and three were in Everett (which has eight tracts). More moderate growth occurred in parts of Malden, Everett, Somerville, Lynn, and other tracts in the Boston neighborhoods listed above.
- In contrast, the black share of the population declined in 40 percent of all Boston-area tracts. These included many tracts in the city of Boston's Roxbury, Dorchester, and Mattapan neighborhoods that were more than 50 percent black in 1990 as well as tracts outside of the city of Boston that had modest shares of blacks in 1990, including tracts in Somerville, West Cambridge and such suburban towns as Arlington and Plymouth.

MAP 1

THE MINORITY POPULATION HAS GROWN IN MOST BOSTON NEIGHBORHOODS



Source: Joint Center for Housing Studies, Boston Neighborhood Change Interactive Map.

2. Increasing Income Inequality

Relative to the US, household incomes in the Boston metropolitan area are high and rising. However, the growth is unevenly distributed among the population. Most notably:

- In 2016, the median household income for all households in greater Boston was $79,600, which was 52 percent higher than in the nation as a whole.[2] Boston ranked sixth among the 100 largest metro areas for median household incomes, trailing only San Jose, Bridgeport, Washington, DC, San Francisco, and Honolulu.
- Adjusting for inflation, the real median increase in household income for the region was 7.0 percent between 1990 and 2016, a time when the US real median income dropped 2.1 percent,[3] and real median incomes declined in 70 of the nation's 100 largest metro areas.
- However, while the number of high-income households (with real incomes of $150,000 or more) grew by 65 percent between 1990 and 2016, the number of low-income households (earning less than $50,000) also grew by 16 percent. In contrast, the number of middle-income households (with real incomes from $50,000 to $150,000) increased by only 2 percent.

In addition, the income growth was unevenly distributed across the metro area. For example:

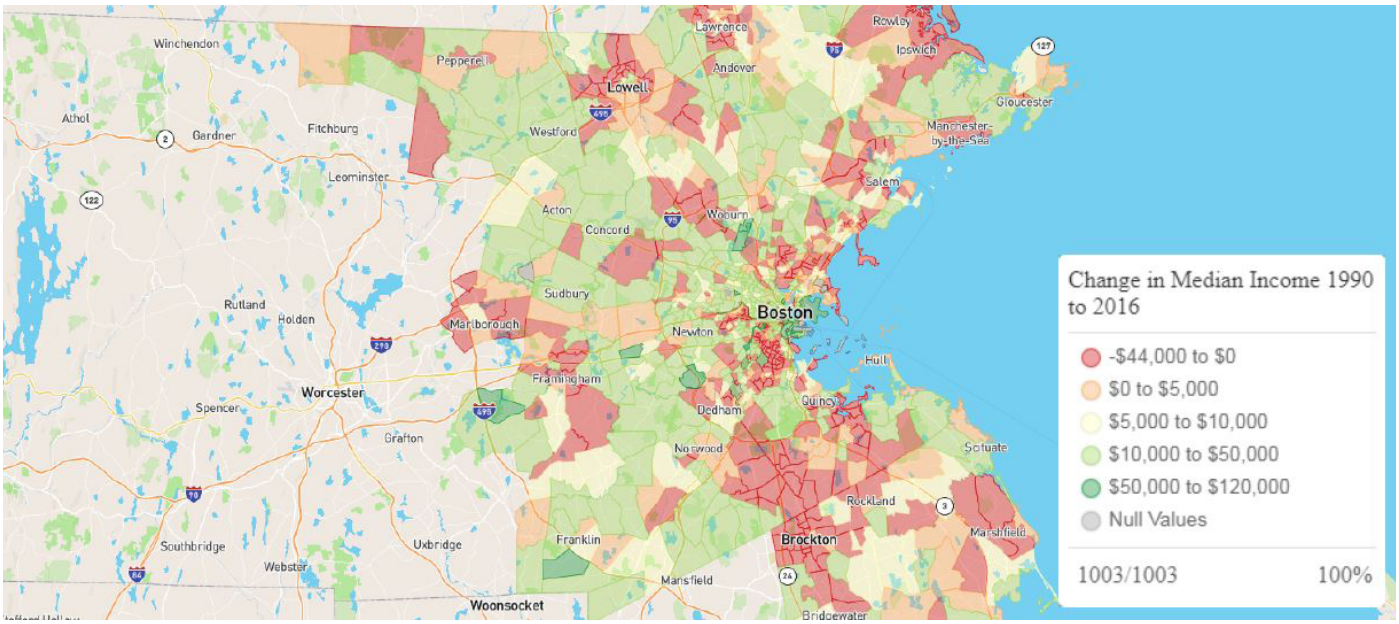
- Between 1990 and 2016, real median household incomes increased in 65 percent of the region's census tracts. Increases were largest (exceeding $50,000) in a handful of tracts located in South Boston, Charlestown, downtown Boston and West Cambridge, as well as in suburban tracts in Franklin, Hopkinton, Needham, Wellesley and Winchester.
- In percentage terms, real household income grew by more than 20 percent in 271 tracts, including some located in Boston's Jamaica Plain and South Boston neighborhoods, some in nearby Cambridge, Somerville, and Arlington, and some in farther flung locales, such as Newton, Portsmouth (NH) and Waltham.
- In contrast, real median household incomes fell in over a third of the region's census tracts, with declines exceeding 10 percent in over 20 percent of

the region's tracts (**Map 2**). Tracts with the largest declines were located in such different Boston neighborhoods as Brighton, Dorchester, and Roxbury, as well as in such outlying cities as Brockton, Framingham, and Lowell.

- While incomes rose in 76 percent of the tracts that were in the highest quartile for household income in 1990, they increased in only half (52 percent) of the tracts that were in the lowest quartile for income in 1990.[4]
- High-income tracts also had higher rates of income growth. Overall, between 1990 and 2016, real median incomes grew by 11.6 percent in census tracts where the real median household income in 1990 was above $100,000 (in 2014 dollars). In contrast, they grew by only 0.5 percent in tracts where the real median income was below $50,000 in 1990.

MAP 2

INCOME GROWTH HAS VARIED WIDELY ACROSS NEIGHBORHOODS



Source: Joint Center for Housing Studies, Boston Neighborhood Change Interactive Map.

3. GROWING AND MORE CONCENTRATED POVERTY

Since 1990, the number of poor people in metro Boston has risen sharply, as has the number of people living in high-poverty census tracts (areas where at least 20 percent of the population lives in poverty). In particular:

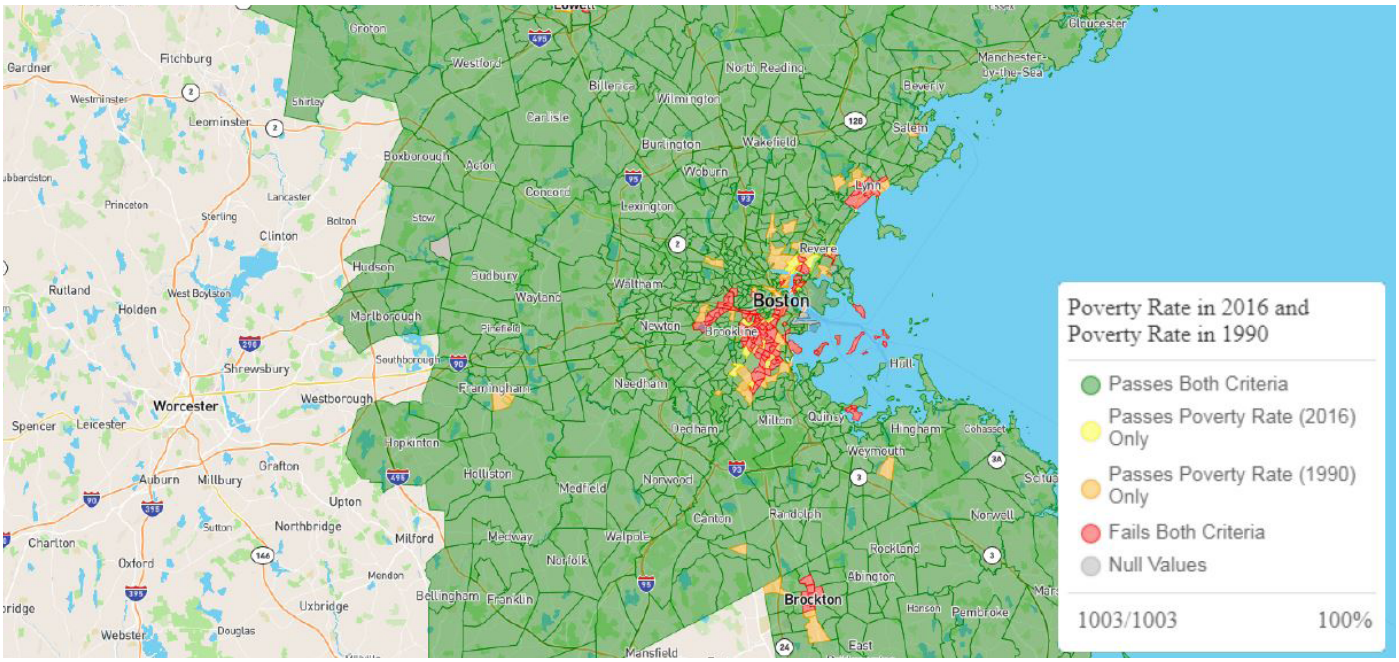
- Between 1990 and 2016, the number of people living in poverty in the Boston metro area rose by 41 percent, increasing from 332,000 to 467,000 individuals. The region's increase was slightly less than the 48 percent increase for the nation as a whole.
- Between 1990 and 2016, the number of poor people living in high-poverty census tracts increased by 48 percent, rising from 122,500 to 181,200 individuals. As a result, 39 percent of the metro area's poor lived in such tracts in 2016, up slightly from 37 percent in 1990.
- As a result of the increase, the region's poverty rate rose from 8 percent of the population in 1990 to about 10 percent in 2016. However, the Boston metro area poverty rate was still significantly lower than the national rate of 15 percent rate. Moreover, Boston's poverty rate was the 7th lowest among the nation's 100 largest metros, trailing only the Washington DC, Bridgeport, Honolulu, San Jose, Ogden (UT), and Minneapolis metro areas.

Poverty remains highly concentrated in the Boston region, and the increase in poverty mostly occurred in or near tracts that were already high-poverty or low-income areas. Most notably:

- The number of high-poverty census tracts increased from 133 in 1990 to 167 in 2016.[5] While many of these tracts are located in Boston and some nearby communities, several are located in farther-flung areas, including substantial parts of the region's older, smaller industrial cities, particularly Lawrence, Lowell, and Lynn (**Map 3**).
- Many of the tracts that have become high-poverty since 1990 are located next to areas that were high-poverty as of 1990, in places such as Dorchester, Brighton, Haverhill, Lawrence, and Lynn. But some are in places that previously did not include a high-poverty neighborhood, such as Framingham, Malden, Stoughton and Weymouth. In all, the number of cities and towns that included a high-poverty neighborhood increased from 13 in 1990 to 20 in 2016.
- Still, 84 percent of high-poverty tracts in 2016 were located in six cities—Boston, Brockton, Chelsea, Lawrence, Lowell, or Lynn—compared to 91 percent in 1990. In addition, these six cities had 46 percent of the region's poor population in 2016 and 86 percent of poor living in high-poverty neighborhoods. These figures are down only marginally from 1990 when these areas were home to 51 percent of the Boston region's population living in poverty and 93 percent of the poor living in high-poverty neighborhoods.

MAP 3

THE NUMBER OF HIGH-POVERTY NEIGHBORHOODS HAS GROWN, EXPANDING INTO ADJACENT TRACTS



Source: Joint Center for Housing Studies, Boston Neighborhood Change Interactive Map.

4. RISING HOUSING COSTS

Home prices and rents are high and have risen significantly in most tracts across the Boston metro area.

- Between 1990 and 2016 the real median home value in the Boston metro area rose 26 percent, from $291,200 to $368,300.[6] The median home value in greater Boston was 120 percent greater than the national median of $167,300 in 2016 (a slightly smaller difference than in 1990 when it was about 123 percent greater). Moreover, only nine metro areas had median home values higher than those in greater Boston.[7]

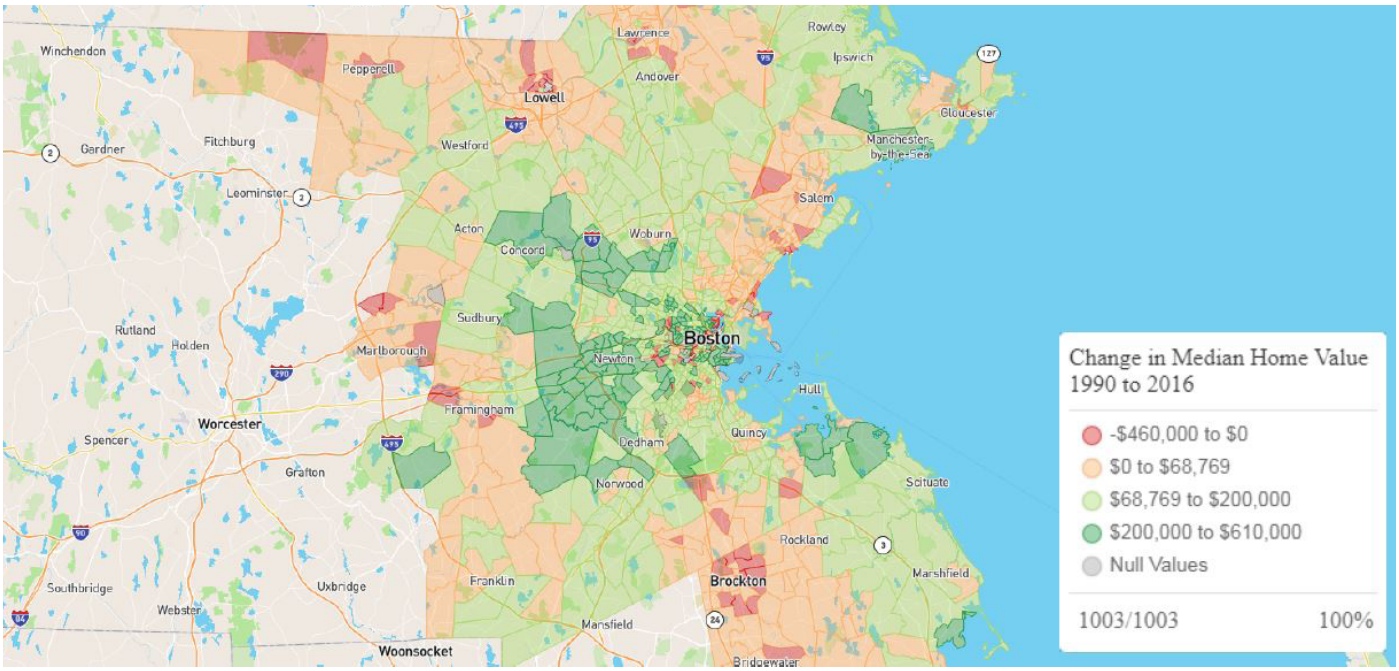
- The real median home value increased in 88 percent of Boston-area census tracts between 1990 and 2016 (and in 99 percent of tracts between 2000 and 2016). Real home values grew the most in the urban core cities of Boston, Cambridge, and Somerville, and in many affluent suburban communities to the west of Boston as well as some on the North and South Shores.
- The 12 percent of tracts in the region where real home values fell between 1990 and 2016 were located primarily in southern New Hampshire, particularly in Rochester and Derry, and in some older Massachusetts cities, notably Brockton and Lowell (**Map 4**).

In general, increases were greatest in tracts with high home values in 1990 and smallest in tracts with low home values in 1990. Prices rose 32 percent in 1990–2016 among tracts in the highest quartile for median home values in 1990, compared to just 12 percent growth among tracts in the lowest quartile. However, there were 59 tracts where home values were below the region's median in 1990 but where median home price increases exceeded 50 percent in 1990–2016—more than twice the region-wide change in home prices. Almost all these tracts are located in Boston (particularly South Boston, Roxbury, and northern Dorchester), Cambridge, or Somerville.

- On the rental side, median rents at the tract level have not increased as sharply as home prices, partly because this measure includes rents reported by all renters rather than just current market-rate rents paid by recent movers. The real median rent in the region's median tract rose by 11 percent between 1990 and 2016, increasing from $1,100 to $1,300. Real median rents increased in 73 percent of the region's census tracts. In percentage terms, the largest increases occurred in tracts in urban core areas such as South Boston, Charlestown, Jamaica Plain, East Cambridge, and Brookline. The smaller number of tracts where real median rents dropped were spread throughout the region, including many tracts in the region's outlying areas. As a result of these changes, there is less low-cost housing, particularly in high-cost neighborhoods. Illustratively:
- Throughout the region, less than one in three units (31 percent) rented for less than $1,000 in 2016, down from 44 percent in 2000. Moreover, in 2016, real median rents were less than $900 in only 10 percent (93 tracts) of Boston metro tracts, down from 13 percent in 1990 and 22 percent in 2000. While 30 percent of these tracts were in Boston, including many in Roxbury and Dorchester, the rest were spread among both the region's older industrial cities and some lower-density outlying areas, particularly in such southeastern Massachusetts communities as Carver, Middleborough and Plympton, and in several locales in southern New Hampshire, including tracts located in Atkinson, Candia, Hampstead and Rochester.
- Across the entire region, the share of homes valued under $300,000 (in real terms) dropped from 39 percent in 1990 and 47 percent in 2000 to just 31 percent in 2016. Moreover, in 2016, the real median home value was below $300,000 in 26 percent of the region's tracts, down from 56 percent in 1990. Tracts with lower median home values today are located primarily in the region's older industrial cities, in large parts of southern New Hampshire, in parts of Boston's Dorchester and Mattapan neighborhoods, and in several smaller communities near Brockton in southeastern Massachusetts.
- In high-cost neighborhoods (where median home values in 2016 exceeded $450,000), the share of modestly priced homes (with real home values below $300,000) dropped from 17 percent in 1990 to 8 percent in 2016. In contrast, the share of homes worth more than $500,000 in high-cost neighborhoods increased from 38 percent in 1990 to 64 percent in 2016. All told, the share valued at $500,000 or more rose from 18 percent in 1990 to 29 percent in 2016.

MAP 4

HOME PRICES HAVE INCREASED SIGNIFICANTLY IN MOST BOSTON NEIGHBORHOODS



Source: Joint Center for Housing Studies, Boston Neighborhood Change Interactive Map.

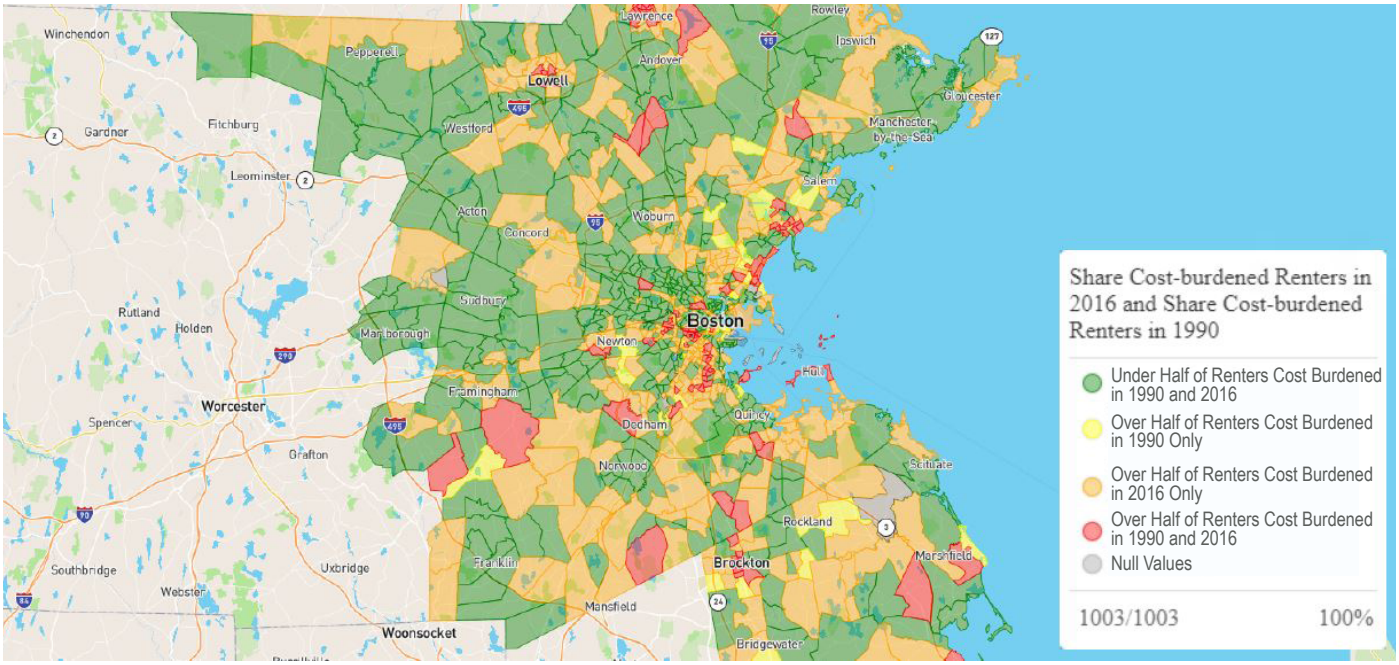
5. More Cost-Burdened Renters and Homeowners

In general, while incomes have risen, their growth has been slower than the increase in rents and house prices. As a result, a growing number of households are considered cost-burdened because they pay 30 percent or more of their income for housing.[8] Most notably:

- 47 percent of the approximately 689,800 renter households in the Boston metro area were cost-burdened in 2016, up from 39 percent in 1990 (when 251,200 of the region's 637,600 renters were cost-burdened) and 37 percent in 2000 (when 240,000 of the region's 656,400 renters were cost-burdened). Between 2000 and 2016, when the cost-burden rate increased sharply, real median rents rose by 18 percent while the real median income of renter households declined by nearly 7 percent.[9] As a result, the share of renter households with cost burdens increased in nearly 72 percent of tracts between 1990 and 2016 and about 80 percent of tracts between 2000 and 2016.
- The share of tracts where the renter cost-burden rate exceeded 50 percent skyrocketed from 15 percent of all tracts in 1990 to 46 percent of all tracts in 2016 (**Map 5**). The tracts where at least half the renters were cost-burdened in 2016 are located throughout the region. The majority are places where median household incomes were below the region's median in 2016.
- The growth in high renter cost-burden tracts occurred throughout the region, particularly along the North hore from Chelsea to Gloucester and in southeastern Massachusetts from Brockton to Plymouth and beyond. Rates increased by 9 percentage points on average in tracts where median household incomes were between $50,000-$100,000 in 1990, compared to a 6-percentage-point increase for tracts with lower incomes and a 7-percentage-point increase in higher-income tracts.
- Cost-burden rates for the region's homeowners lso grew, rising from 18 percent of all homeowner households in 2000 to 37 percent in 2010 (at the height of the Great Recession) before falling to 29 percent in 2016.[10] More than half of homeowners were cost-burdened in about 5 percent of the region's tracts, most of them in or near Dorchester, Brockton and Lawrence. Less than 20 percent of homeowners are cost-burdened in about 8 percent of tracts, which are spread throughout the region.

MAP 5

RENTER AFFORDABILITY HAS DETERIORATED THROUGHOUT THE REGION



Source: Joint Center for Housing Studies, Boston Neighborhood Change Interactive Map.

6. Gentrification and Stagnation in Low-Income Tracts in Metropolitan Boston

The preceding analyses point to the emergence of two types of change in low-income neighborhoods in the region, both of concern to policymakers. First are "gentrified" areas: formerly low-income, urban tracts where significant ocioeconomic changes have occurred. Second are "non-gentrified" areas: low-income tracts that not only have not gentrified but, in many cases, have become poorer. Because there is no single accepted definition of gentrification and the socioeconomic changes that characterize gentrification are difficult to quantify, we looked at several metrics used by various scholars.[11]

For the purposes of this brief, we adopt a widely-used measure that considers tracts to have "gentrified" if:

- Median household incomes in 1990 were below the metro-wide median, and
- Median house prices or rents grew by more than the metro-wide medians between 1990 and 2016, and
- The share of residents who were college-educated also grew by more than the metro-wide median percentage point increase.

Using these criteria, we find that between 1990 and 2016, 167 of 485 low-income tracts in 1990 had gentrified by 2016. Brief discussions of both the "gentrified" and "non-gentrified" tracts follow.

Gentrified Tracts

- Many of the gentrified tracts were located in the city of Boston, particularly in South Boston, East Boston, Charlestown, and parts of Dorchester, Roxbury, Mission Hill, and Jamaica Plain. Many tracts in Cambridge and Somerville also gentrified in 1990–2016, as did tracts in several outlying areas including Gloucester, Malden, Quincy, and Waltham (Map 6).
- On average, home values in the gentrified tracts grew 47 percent, rents rose by 39 percent, incomes increased by 29 percent, and the share of adults with a bachelor's degree grew by 27 percentage points. The increases in all these metrics far exceeded the metro-wide average (See Appendix A).

Median rents in gentrified neighborhoods went from just under $1,080 in 1990 (which was below the Boston metro area's median rent of $1,140 in that year) to nearly $1,470 in 2016 (which was well above the region's median rent of $1,270 in that year).

The real median home price in gentrified neighborhoods also increased sharply, rising from $292,000 in 1990 (slightly more than the region's median of $291,000) to $425,000 (significantly more than the region's median of $368,000).

Minorities made up lower shares of population in low-income tracts that gentrified, and minority shares increased at a much slower pace relative to low-income tracts that did not gentrify. In gentrified tracts, the share of minorities rose 13 percentage points, from 19 percent to 32 percent. The bulk of this increase was due to a 10-percentage-point increase (from 5 to 15 percent) in the share of Asians/others living in these tracts. The share of Hispanics living in these tracts rose by 3 percentage points, while there was no change in the share of blacks living in the gentrified tracts. While the overall share of whites living in all gentrified tracts fell, it rose in a small number of particular gentrified tracts, many of them located in the city of Boston.

Non-Gentrified Low-Income Tracts

The 318 non-gentrified tracts are mainly located in large parts of Boston's Dorchester, Mattapan, and Hyde Park neighborhoods; in most or all of Brockton, Chelsea, Lawrence, Lowell, Lynn, Revere, and Rochester; and in parts of Framingham and Marlborough.

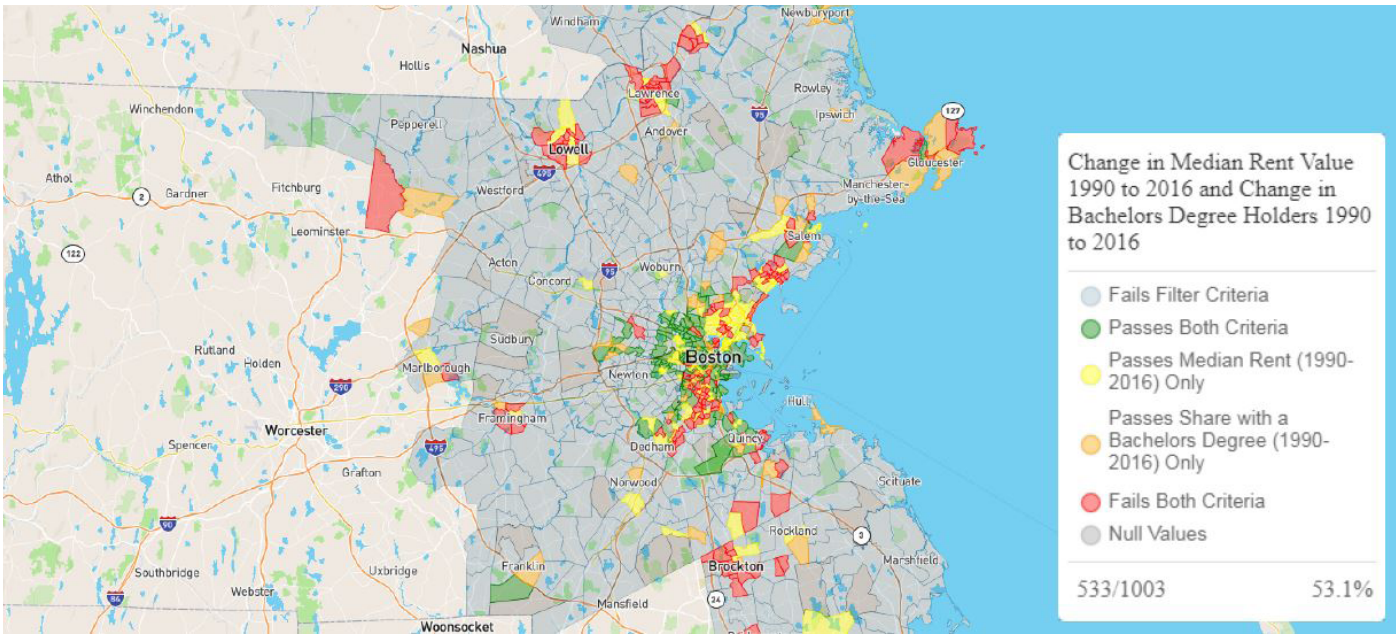
- Most non-gentrified tracts (281 of 318) failed to gentrify because the share of adults with a bachelor's degree grew by less than the region's median. Nearly as many tracts (276 of 318) failed to gentrify due to lack of home price or rent growth, while 141 tracts had both below-median educational gains and below-median price and rent growth.
- Real rents and home values both grew by less than the region's median (in percentage terms) in 178 of the 318 initially non-gentrified tracts, while in 98 other tracts either home prices (78) or rents (28) increased by less than the region's average.
- In 1990, 24 percent of the residents of the non-gentrified tracts were minorities, and this share increased to 46 percent in 2016. In contrast, in gentrified tracts the minority share rose from 19 percent to 32 percent over this period. Most of this growth in the minority share of population in non-gentrified neighborhoods was the result of a 13-percentage-point increase in the Hispanic population. However, the shares of blacks and Asians also rose by 3 and 6 percentage points, respectively. (As noted above, the comparable figures for the gentrified tracts were 3 percentage points for Hispanics, no change for blacks, and 10 percentage points for Asians/others.)

Moreover, there were signs of growing economic distress in the majority of low-income tracts that did not gentrify between 1990 and 2016. Most notably:

- On average, the median income in non-gentrified low-income tracts declined 2 percent between 1990 and 2016. In contrast, median incomes in the region as a whole increased by 9 percent in this time.
- Only 23 percent of the adult population had a bachelor's degree in the typical low-income non-gentrified tract in 2016, compared to 43 percent for the typical tract in the metro region. Additionally, in non-gentrified tracts, the median increase in share with a bachelor's degree grew just 8 percentage points between 1990 and 2016, compared to the 15-percentage-point median increase for the region.

MAP 6

MANY, BUT NOT ALL LOW-INCOME NEIGHBORHOODS SHOWED SIGNS OF GENTRIFICATION



Notes: The map shows all gentrifiable census tracts that have median household incomes below the metro-wide median in 1990. The map was created using the JCHS Neighborhood Change Database, using a pass/fail map with two criteria and one filter. The first criterion shows tracts with above-the-median change in median rents from 1990 to 2016 (from $118 to $1,800); the second criterion shows tracts with above-the-median growth in the share of adults with a bachelor's degree from 1990 to 2016 (from 15 to 67 percentage points). The filter restricts neighborhoods to those with median household incomes below the median in 1990 (from $15,000 to $74,213). The map does not identify the 29 tracts that gentrified due to above-median growth in home prices from 1990 to 2016 (but did not have above-median rent growth) as defined in the accompanying text.
Source: Joint Center for Housing Studies, Boston Neighborhood Change Interactive Map.

Conclusions

The Boston metropolitan area has experienced significant economic and social change since 1990, but that change has varied widely across cities, towns, and neighborhoods. Most notably, a closer examination shows a growing gap in incomes, home prices, and rents between the region's most and least affluent areas. The largest increases in incomes, home prices, and rents occurred in tracts where incomes and home prices already were high in 1990. In contrast, the most modest increases generally occurred in places where incomes were lowest in 1990. Moreover, growth in poverty across the region also was concentrated in or near already high-poverty or low-income areas. In a few places, particularly several parts of Boston and some nearby cities (notably Cambridge and Somerville), rents, home prices and the share of college-educated adults also increased significantly, signaling a host of socioeconomic changes related to gentrification. A small number of these areas, particularly in parts of the city of Boston, also were among the few tracts where the share of population that is white also increased.

Overall, racial and ethnic diversity increased in tracts across the region, with the minority share of population rising in 94 percent of the region's tracts and majority-minority tracts more than doubling between 1990 and 2016. Growth among minority groups however, was uneven across the region. Most of the growth in Hispanics and blacks was concentrated in a small number of tracts, many of them in older urban areas. In contrast, the Asian/other minority population increased in a much wider set of areas that included more suburban locations.

The share of households burdened by housing costs also rose in 72 percent of all tracts between 1990 and 2016. In addition, the share of tracts where more than half of all renters were cost-burdened rose from 15 percent in 1990 to 46 percent in 2016. Still, the tracts with the highest shares of cost-burdened renters and owners continue to be in those places with the lowest household incomes.

In summary, the Boston metropolitan area has experienced significant economic and social change since 1990 that in many ways have been positive, but not shared evenly across neighborhoods. Rather, some have become even poorer while others have changed dramatically. This analysis and the attached maps and mapping tools used to create the images not only showcase the wide diversity of change across the region's neighborhoods but also serve as a reminder that such changes are often quite localized and nuanced.

Endnotes

1. Census tracts are small geographical statistical subdivisions of roughly 4,000 people defined by the US Census Bureau before each decennial census. The boundaries of census tracts can change over time, reflecting shifts in population distributions. (See https://www.census.gov/geo/reference/gtc/gtc_ct.html.) The tracts used in this analysis were standardized to 2010 boundaries using Brown University's longitudinal tract database (LTDB). (See John R. Logan, Zengwang Xu, and Brian Stults, "Interpolating US Decennial Census Tract Data from as Early as 1970 to 2010: A Longitudinal Tract Database," The Professional Geographer 66, no. 3 (2014): 412–20.) While the Boston metropolitan area has a total of 1,003 tracts, this analysis focuses on a subset of 987 tracts that had at least ten housing units in 2010 and 2016.

2. All dollar values in this report have been inflation-adjusted to constant 2014 dollars.

3. This is the median change among all US census tracts. If you looked at the median tract in the US each year, declines would be about 4.5 percent.

4. Percentages for this analysis are based on the subset of 987 tracts that had at least ten housing units in 2010 and 2016.

5. High-poverty tracts are not all alike. For example, in most high-poverty tracts (60 percent), the share of adults age 25 or older with a bachelor's degree was less than 25 percent, but in 13 high-poverty tracts (8 percent), several of which were located in Cambridge, and Boston's Allston and Fenway neighborhoods, shares with a degree averaged over 75 percent, suggesting poverty rates in those places were high because of high concentrations of students reporting low or zero income. Such places are characteristically different from other high-poverty tracts, with median home values 73 percent higher on average and more racial homogeneity. However, these tracts do not account for the growth in high-poverty tracts in the Boston metro area.

6. Note that at the tract level, the median increase in median home value was 23 percent. Also, these data are user-reported home values from census surveys, not transaction-based home prices, and, in the case of the 2016 5-Year ACS, are from a collection of 5 years of surveys, 2012-2016, so home prices and appreciation rates may not match other transaction-based home price indices.

7. Self-reported home values were highest in San Jose and San Francisco, followed by Urban Honolulu, Los Angeles, Oxnard, New York, San Diego, Bridgeport, and Washington, DC.

8. Cost burdens as discussed here differ slightly from the standard Joint Center for Housing Studies cost-burden calculations. In contrast to our standard definition, cost-burden calculations in this brief consider renters that pay exactly 30 percent of their income as cost burdened. In addition, due to data limitations, this definition excludes from the calculation entirely renters who pay no cash rent (normally counted as unburdened) and renters with zero or negative income (normally counted as burdened).

9. Renter cost burdens in 2016 are down slightly from the 48 percent rate reached in the wake of the recession in 2010.

10. Housing costs included in owner burden calculations include mortgage payments, property taxes, and home insurance.

11. Our study focused on definitions from three sources in particular: Lei Ding, Jackelyn Hwang, and Eileen E Divringi, "Gentrification and Residential Mobility in Philadelphia," Regional Science and Urban Economics 61 (2016): 38-51; also New York University Furman Center, "Focus on Gentrification," in State of New York City's Housing and Neighborhoods in 2015 (2016), 4-24; and Lance Freeman, "Displacement or Succession? Residential Mobility in Gentrifying Neighborhoods," Urban Affairs Review 40, no. 4 (2005): 463-91.

APPENDIX TABLE A:

CHARACTERISTICS OF GENTRIFIED AND NON-GENTRIFIED CENSUS TRACTS IN METRO BOSTON

	Low-Income Gentrified Tracts	Low-Income Non-Gentrified Tracts	Boston Metro Area
Median 1990			
Median Rent	1,080	1,050	1,140
Median Home Value	292,000	252,000	291,000
Median Income	59,900	57,140	74,260
Share with a Bachelor's Degree (Percent)	27	15	26
Share of Renters with Cost Burdens (Percent)	41	44	39
Share White (Percent)	87	87	94
Share Minority (Percent)	13	13	6
Black	3	2	1
Hispanic	4	5	2
Asian/Other	4	2	2
Median 2016			
Median Rent	1,470	1,110	1,270
Median Home Value	425,000	288,000	368,000
Median Income	75,080	51,930	79,620
Share with a Bachelor's Degree (Percent)	55	23	43
Share of Renters with Cost Burdens (Percent)	47	53	49
Share White (Percent)	67	52	80
Share Minority (Percent)	33	48	20
Black	5	5	2
Hispanic	7	14	5
Asian/Other	12	8	8
Median Change 1990–2016			
Median Rent	310	60	120
Median Home Value	120,000	31,000	68,000
Median Income	13,910	-1,030	4,950
Share with a Bachelor's Degree (Percent)	25	8	15
Share of Renters with Cost Burdens (Percent)	5	9	8
Share White (Percent)	-10	-19	-11
Share Minority (Percent)	10	19	11
Black	0	1	0
Hispanic	2	7	2
Asian/Other	8	5	5

Notes: There are some small differences between the numbers reported in the table and those discussed in the text. Some differences are the result of rounding. Other differences result from alternative ways of calculating similar trends. For example, the median change in the share of minorities among gentrified tracts shown in the table (10 percentage points) differs slightly from the change in the share of minorities across all gentrified tracts reported in the text (13 percentage points).
Source: JCHS Neighborhood Change Database.

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