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State of New York City's Housing and Neighborhoods in 2014



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founding board member of the NYU Furman Center.

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Part 1: Focus on Density

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Focus on Density

In 2010, New York City's population and employment reached all-time highs, marking a significant rebound since the fiscal crisis of the 1970s. Yet the city's housing stock has not kept pace with its growing population, as geographic and regulatory constraints have made new construction challenging. As a result, housing has become increasingly unaffordable for many New Yorkers. Despite the city's notorious housing affordability challenges, however, New York City remains a highly desirable place to live, and people continue to move to the city. In an effort to accommodate future growth and alleviate rent pressures, the city is planning a number of rezonings to add density and spur new construction. Many of these plans have met public apprehension about the effect that denser neighborhoods might have on residents' quality of life. This friction highlights the need for a closer examination of residential density in New York City.

In this year's *State of New York City's Housing and Neighborhoods* report, we examine the evolution of density in New York City's neighborhoods, whether this evolution has been accompanied by changes in New Yorkers' quality of life, and how the city might accommodate future population growth. First, we provide a historical look at how density in New York City has changed over time by looking backward at shifts in New York's population since 1970. Next we describe how density has evolved at the community level and influenced the neighborhood map we see today. We then turn to the built environment and its role in mediating this geography of density. We conclude by exploring several scenarios for accommodating future population growth and consider what implications such growth would have for the density of New York's neighborhoods.

1. Compared to 1970, the typical New Yorker in 2010 experienced a lower level of density in their neighborhood despite a substantial rebound in population.

After a stark population loss of nearly one million people during the 1970s, New York City started growing again in the 1980s. Figure 1.1¹ tracks these changes in New York City's population over time. The city's population increased by 3.5 percent in the 1980s and 9.4 percent in the 1990s. By 2000, the city's population slightly topped the level of 1970. The population continued to grow during the first decade of the 21st century, increasing by 2.1 percent between 2000 and 2010.

With the geographic boundaries of the city fixed, changes in raw population density mechanically mirrored these changes, rising from about 26,100 people per square mile in 1970 to 27,000 people per square mile by 2010. However, raw population density levels can be misleading, as they fail to account for the presence of commercial and sparsely populated areas. Raw density does not reflect the density levels most New Yorkers experience where they live.

¹ According to tabulations from the Neighborhood Change Database, New York City had a population density of about 26,500 people per square mile in 2000. Due to a minor difference in land area, this estimate shows approximately 100 more people per square mile than the U.S. Census Bureau's estimate in 2000, which we report in Figure 1.1 and in Part 3 of this report.

We can better capture the density experienced by a typical New Yorker by using a population-weighted measure that accounts for the fact that many more New Yorkers reside in fairly high-density neighborhoods than in low-density neighborhoods. We define “neighborhoods” as Census tracts—small areas of land generally encompassing 2,000 to 8,000 people. In 2010, there were 2,217 tracts in New York City. From this point on in this section, when we describe the population density of New York, or other cities or metropolitan areas, we present the median tract density experienced by city residents, or “experienced density.” Specifically, for every person in the city, we find the population density of her Census tract. The median represents the population density in the middle, which the “typical” resident experiences.²

A) New York City’s population growth since 1980 has been concentrated in lower-density areas.

Figure 1.2 shows that even though more people lived in the city in 2010 than ever before, the typical New Yorker lived in a lower density neighborhood than the typical New Yorker in 1970. Specifically, the typical resident in 2000 lived in a tract with almost 5,000 fewer people per square mile than in 1970, and this changed little by 2010. The population growth since 1980 has been concentrated in lower density areas of the city.

Figure 1.3 illustrates this reshuffling of New York’s population from high-density to low-density tracts between 1970 and 2010. Broadly speaking, the proportion of the city’s population living in tracts with a population density in excess of 70,000 people per square mile of land shrank, while the proportion living in less dense areas grew. The biggest increase occurred in tracts with between 50,000 and 60,000 people per square mile, where one in 10 New Yorkers resided in 2010. This level of density corresponds with the average density of the East Harlem sub-borough area in Manhattan.³

² More formally, to find the median neighborhood density experienced by city residents, we compute the raw population density, population per square mile of land for each Census tract, and then find the median tract density, weighting each tract by its population. When presenting neighborhood-level population densities, we always use the standard population density measure, persons per square mile of land, not the median density experienced by city residents.

³ In 2010, a population density of 7,000 people per square mile was roughly equivalent to the average density of the South Beach/Willowbrook and Tottenville/Great Kills sub-borough areas in Staten Island; 20,000 people per square mile was about the average density of Hillcrest/Fresh Meadows and South Ozone Park/Howard Beach in Queens; the sub-borough area with the highest population density, the Upper East Side, housed nearly 109,000 people per square mile.

Figure 1.1: Population and Population Density in New York City

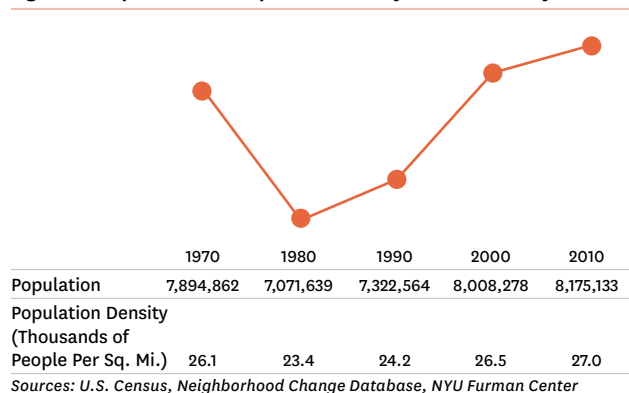


Figure 1.2: Median Neighborhood (Tract) Population Density Experienced by New York City Residents

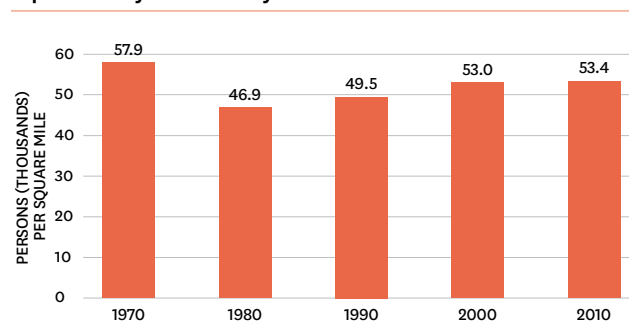
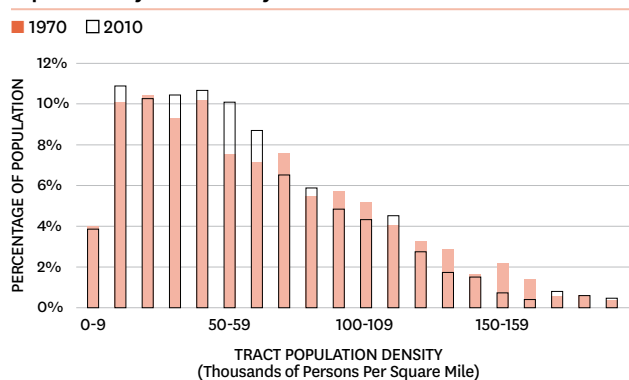


Figure 1.3: Distribution of Neighborhood (Tract) Population Density Experienced by New York City Residents



B) While recent growth made slow changes to the geography of density, the rapid exits of the 1970s still leave their mark.

Map A in Figure 1.4 depicts the density of the city's 55 sub-borough areas in 2010.⁴ Unsurprisingly, Manhattan's neighborhoods (except East Harlem, Clinton/Chelsea/Midtown, and Financial District/Greenwich Village/Soho) and the western edge of the South Bronx made up the densest areas of the city with more than 65,000 people per square mile of land in 2010. Pockets of high density also appeared notably in a swath of Brooklyn neighborhoods from Bensonhurst to Bushwick and the Queens neighborhoods of Astoria, Jackson Heights, Elmhurst/Corona, and Rego Park/Forest Hills. Table 1.1 lists the densest ten sub-borough areas in the city for 1970 and 2010. In 1970 the densest sub-borough area was Central Harlem with over 111,000 people per square mile; by 2010 Manhattan's Upper East Side was the densest with about 109,000 people per square mile.

Several neighborhoods experienced substantial increases in density between 1970 and 2010, even as the typical New Yorker lived in a less densely populated neighborhood. Table 1.2 and Figure 1.4 portray changes in the population density of sub-borough areas over this 40-year period and during notable decades. Population grew with the construction or conversion of housing units in the Manhattan neighborhoods of Chelsea/Clinton/Midtown and Greenwich Village/

Financial District. Other neighborhoods that experienced sizable increases in density (in excess of 10,000 people per square mile of land) include Stuyvesant Town/Turtle Bay in Manhattan, Kingsbridge Heights/Moshulu in the Bronx, and the Queens neighborhoods of Elmhurst/Corona and Jackson Heights. Many low-density areas saw substantial growth, from Staten Island to Throgs Neck/Co-op City in the Bronx and Flushing/Whitestone in Queens. These changes in the geography of density illustrate how it was possible for the typical city resident to reside in a lower-density neighborhood in 2010 than in 1970 despite citywide population growth.

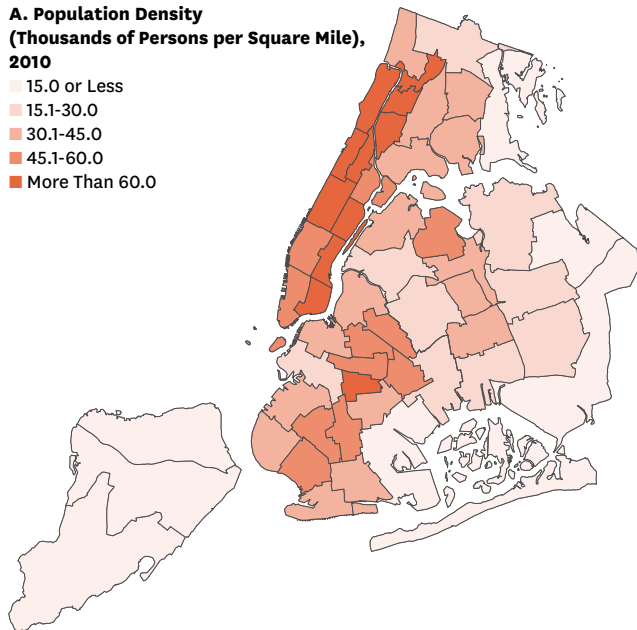
Over this 40-year span, the most striking declines in density occurred in the South Bronx, portions of North and Central Brooklyn, and the Manhattan neighborhoods of the Lower East Side and East and Central Harlem. These neighborhoods suffered dramatic population losses during the 1970s (shown in Map C in Figure 1.4). Though many of these neighborhoods increased in population during the 2000s (including the South Bronx, Central Harlem in Manhattan, and Bushwick and Bedford-Stuyvesant in Brooklyn), these increases were not enough to counteract the substantial losses of the 1970s. Except for southern and central Manhattan neighborhoods where density increased, few of the city's other neighborhoods saw much change during the 2000s.

⁴ Sub-borough areas partition the city into 55 broad neighborhoods that are much larger than Census tracts. Because sub-borough areas are groupings of Census tracts, they show less variation in population density. Sub-borough areas are similar in size and delineation to the city's 59 community districts with a few exceptions. As in the case of Census tracts, we only describe the population density of sub-borough areas using the standard measure persons per square mile of land—not the median density experienced by residents. See the Methods chapter for more detail about sub-borough areas.

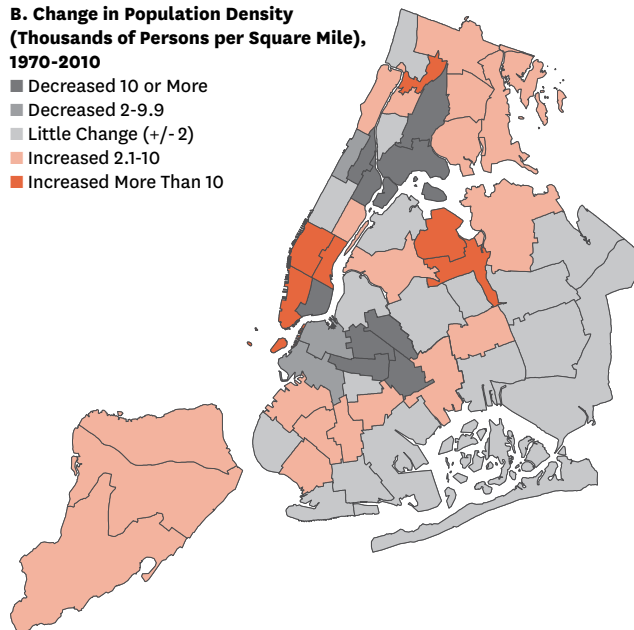
Figure 1.4: Changing Population Density, New York City, 1970-2010

**A. Population Density
(Thousands of Persons per Square Mile),
2010**

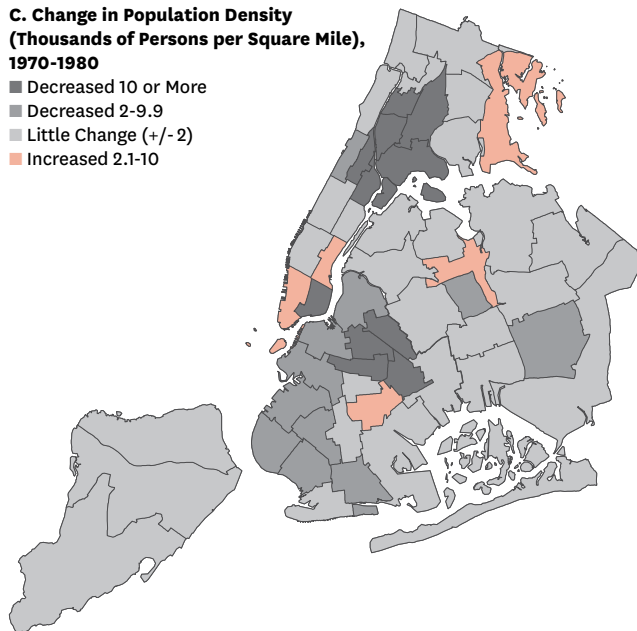
- 15.0 or Less
- 15.1-30.0
- 30.1-45.0
- 45.1-60.0
- More Than 60.0

**B. Change in Population Density
(Thousands of Persons per Square Mile),
1970-2010**

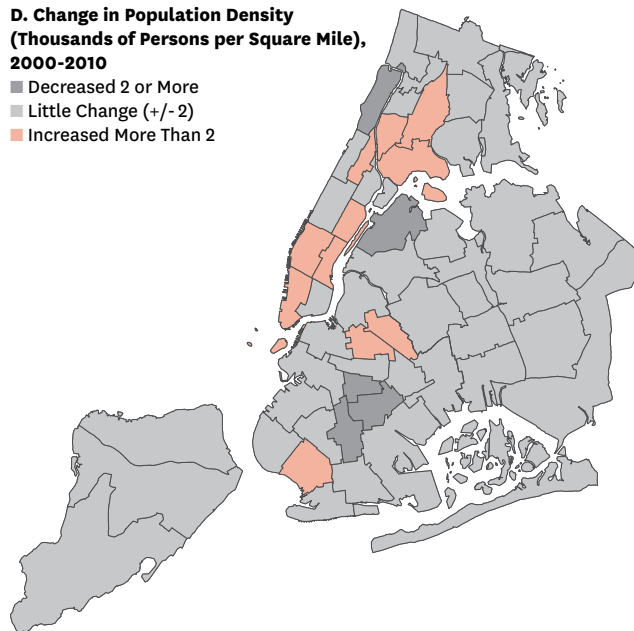
- Decreased 10 or More
- Decreased 2-9.9
- Little Change (+/- 2)
- Increased 2.1-10
- Increased More Than 10

**C. Change in Population Density
(Thousands of Persons per Square Mile),
1970-1980**

- Decreased 10 or More
- Decreased 2-9.9
- Little Change (+/- 2)
- Increased 2.1-10

**D. Change in Population Density
(Thousands of Persons per Square Mile),
2000-2010**

- Decreased 2 or More
- Little Change (+/- 2)
- Increased More Than 2



Sources: U.S. Census, Neighborhood Change Database, NYU Furman Center

Table 1.1: Most Densely Populated Neighborhoods, New York City, 1970 and 2010

Highest Population Density in 1970

Rank	SBA	Population Density (Thousands of Persons per Sq. Mi.)
1	308 Central Harlem	111.4
2	302 Lower East Side/Chinatown	104.8
3	306 Upper East Side	99.4
4	104 University Heights/Fordham	85.5
5	307 Morningside Heights/Hamilton Heights	78.9
6	304 Stuyvesant Town/Turtle Bay	77.0
7	203 Bedford Stuyvesant	74.0
8	103 Highbridge/South Concourse	69.5
9	208 North Crown Heights/Prospect Heights	69.0
10	105 Kingsbridge Heights/Mosholu	66.0

Highest Population Density in 2010

1	306 Upper East Side	109.0
2	302 Lower East Side/Chinatown	94.4
3	304 Stuyvesant Town/Turtle Bay	92.0
4	104 University Heights/Fordham	88.9
5	308 Central Harlem	82.0
6	105 Kingsbridge Heights/Mosholu	79.1
7	307 Morningside Heights/Hamilton Heights	75.4
8	103 Highbridge/South Concourse	70.2
9	310 Washington Heights/Inwood	66.5
10	305 Upper West Side	65.7

Sources: U.S. Census, Neighborhood Change Database, NYU Furman Center

Table 1.2: Neighborhoods With Largest Changes in Population Density 1970-2010, New York City

Rank	SBA	Population Density (1,000s of Persons per Sq. Mi.) 1970	Population Density (1,000 of Persons per Sq. Mi.) 2010	Difference in Population Density	Percentage Change in Population Density
SBA's With Biggest Increases in Population Density					
1	301 Greenwich Village/Financial District	30.3	50.4	20.0	66%
2	304 Stuyvesant Town/Turtle Bay	77.0	92.0	15.0	19%
3	404 Elmhurst/Corona	25.9	40.1	14.1	55%
4	403 Jackson Heights	31.9	45.1	13.2	42%
5	105 Kingsbridge Heights/Moshulu	66.0	79.1	13.1	20%
6	303 Chelsea/Clinton/Midtown	35.4	47.1	11.7	33%
7	306 Upper East Side	99.4	109.0	9.6	10%
8	409 Ozone Park/Woodhaven	23.0	30.1	7.1	31%
9	214 Flatbush	47.9	54.6	6.7	14%
10	207 Sunset Park	29.7	35.4	5.8	19%
SBA's With Biggest Decreases in Population Density					
1	308 Central Harlem	111.4	82.0	-29.4	-26%
2	102 Morrisania/Belmont	59.2	36.9	-22.2	-38%
3	216 Brownsville/Ocean Hill	63.6	46.2	-17.4	-27%
4	101 Mott Haven/Hunts Point	49.5	32.1	-17.4	-35%
5	203 Bedford Stuyvesant	74.0	58.4	-15.6	-21%
6	309 East Harlem	64.8	50.8	-14.0	-22%
7	208 North Crown Heights/Prospect Heights	69.0	55.3	-13.6	-20%
8	204 Bushwick	63.1	51.1	-12.0	-19%
9	302 Lower East Side/Chinatown	104.8	94.4	-10.4	-10%
10	206 Park Slope/Carroll Gardens	34.9	26.5	-8.4	-24%

Sources: U.S. Census, Neighborhood Change Database, NYU Furman Center

2. New York City and its metro area remain far more dense than other large U.S. cities and metro areas.

New York is by far the most populous city in the U.S., and its typical resident experiences levels of neighborhood density far exceeding those of typical residents in other cities. Changes in population density for the next 10 largest cities were mixed over the last four decades, while their surrounding metropolitan areas typically became much less dense.

A) Except for New York City, no major U.S. city saw both population growth and a decrease in experienced density since 1970.

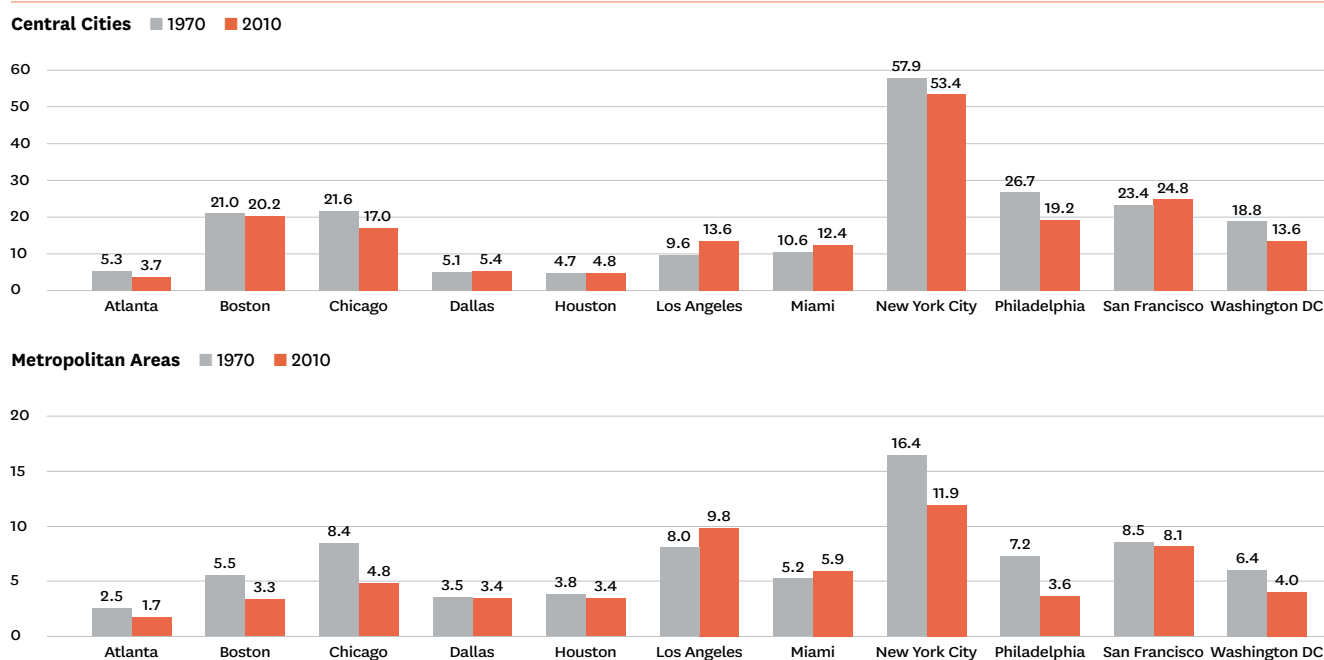
Figure 1.5 shows that density levels in New York City remain exceptional among large U.S. cities. In 2010, the population density experienced by the typical resident was more than twice that of the second densest city, San Francisco. In fact, in 2010, only 20.3 percent of New York City's residents lived in a tract with a density level at or below that experienced by the typical resident of San Francisco in 2010. Unlike New York, a few large central cities saw increases in density for their typical inhabitant between 1970 and 2010. Los Angeles, Miami, and San Francisco showed increases in excess of one percentage point, while Dallas and Houston showed marginal

increases. The typical resident of the six remaining central cities, including New York City, experienced reductions in population density. However, New York City is unique among this group because its median experienced density decreased even as its population increased. In Atlanta, Boston, Chicago, Philadelphia, and Washington DC, declining population at least partially explains decreases in experienced density.

The bottom panel in Figure 1.5 focuses on changes in the population density of metropolitan areas.⁵ Metropolitan area population density outside the city boundaries is substantially lower than inside the city limits, leading the typical metropolitan area resident to experience much lower densities than the median central city resident. Mirroring central city residents, the typical New York metropolitan area resident saw a decrease in the population density of their tract between 1970 and 2010. The trend of decreasing experienced density in the metropolitan area was common nationwide. Looking beyond the New York metropolitan area, the experienced neighborhood density of the typical resident increased between 1970 and 2010 in only two metropolitan areas: Los Angeles (by 1,800 residents per square mile) and Miami (by 700 residents per square mile).

⁵ In this analysis, we define metropolitan areas as core-based statistical areas set by the U.S. Office of Management and Budget.

Figure 1.5. Median Neighborhood Density Experienced by Residents of Large Central Cities and Metropolitan Areas, 1970-2010



Sources: U.S. Census, Neighborhood Change Database, NYU Furman Center

B) Despite having about one-fifth the population of the New York City metropolitan area, the San Francisco metropolitan area is most similar in terms of its variety of density levels.

Another way to compare the density levels of metropolitan areas is to divide their populations into groups by the population density of their Census tracts. We start by finding the density levels that, when used as cutoff points, divide the 2010 New York City metropolitan area population into five equally sized groups. For example, one in five people lived in tracts with density exceeding 56,700 people per square mile in 2010, while another one in five lived in tracts with less than 2,700 people per square mile. We then divide the comparison metropolitan area's populations into groups using the same neighborhood population density cutoff points. Figure 1.6 shows the proportion of each metropolitan area's population that falls in each of the five bins.

Much of the broader New York City metropolitan area population lives at density levels comparable to those experienced in other large metropolitan areas. However, the large proportion of New York metropolitan area residents living in very high-density tracts, with more than 56,700 people per square mile, is unparalleled. Virtually no one in Philadelphia, Miami, Houston, Dallas, or Washington DC lived in a tract with the density levels experienced by the top fifth of New York metropolitan area residents in 2010. The San Francisco metropolitan area had the second highest proportion of its population in the highest-density tracts, though only one in 50 of its residents lived at this level of density.

The Atlanta metropolitan area is unique among these large metropolitan areas as fully two-thirds of its population lived in neighborhoods in the lowest-density category in 2010. While the Los Angeles metropolitan area is often described as sprawling, few of its residents lived in neighborhoods that fall in the lowest-density categories. About half of the population of Los Angeles lived in neighborhoods in the middle category, with density roughly similar to that of Staten Island or Rockaway/Broad Channel in Queens.

It is worth noting that these distributional differences do not solely reflect overall measures of density and population change across cities. For instance, the Boston metropolitan area had far more people living in both the two highest-density categories and the very lowest-density category than did either Dallas or Houston, despite all three cities having nearly equivalent median metropolitan density in 2010.

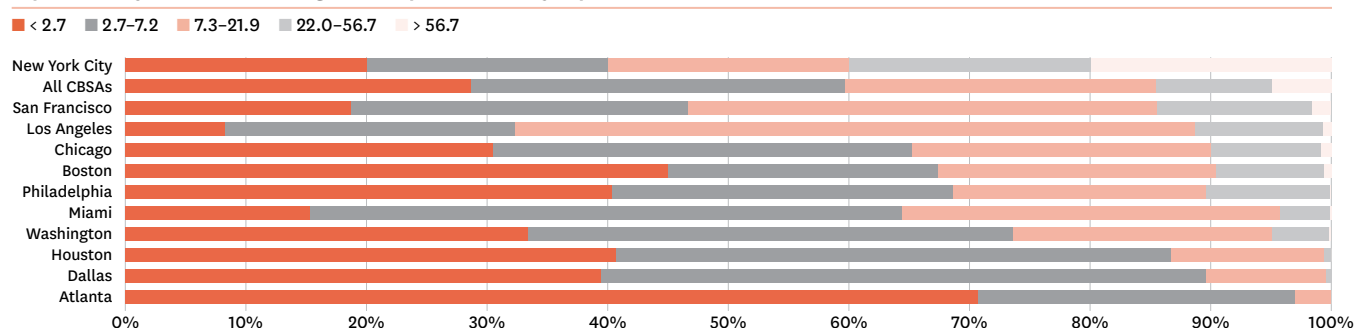
3. New York City's housing density continues to increase.

A neighborhood's population density can increase through the addition of housing units, an increase in the number of people per unit, or a combination of both. As we show below, increases in the number of housing units have been by far the predominant driver of increases in density in New York City since 1970—not the number of people per housing unit.

A) The addition of new housing units facilitated increases in New York City's population density since 1980.

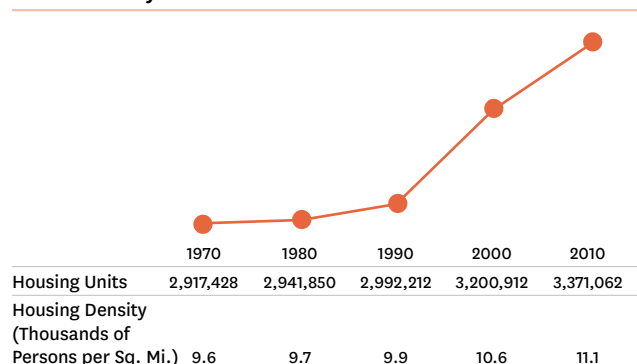
The lived experience of density is mediated by a city's structures. Crowded sidewalks may mask relatively spacious housing quarters, while tall buildings with little open space may contribute to a sense of density even when few people are around. Figure 1.7 presents the total number of housing units in the city in each decade since 1970. This number has increased during every decade, rising more than 15 percent since 1970 to reach 3,371,062 units in 2010, according to the U.S. Census. The pace of additions increased markedly after 1990, and the past two decades of growth in housing units accounted for nearly all of the increase since 1970. City-wide housing unit density (the number of housing units per square mile) has increased as a result, rising from around 9,600 units per square mile in 1970 to about 11,100 units per square mile in 2010.

Figure 1.6: Neighborhood Population Density (Thousands of Persons per Square Mile) Experienced by Residents of 10 Largest Metropolitan Areas by Population, 2010



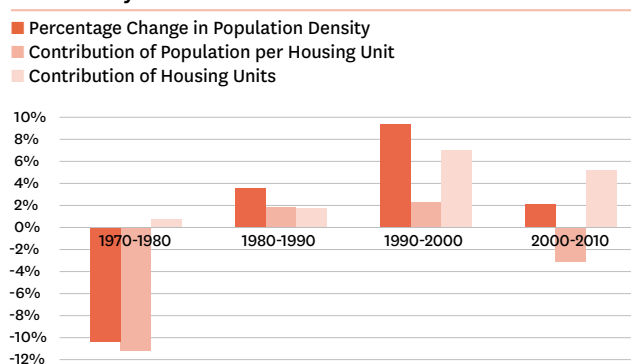
Sources: U.S. Census, Neighborhood Change Database, NYU Furman Center

Figure 1.7: Housing Units and Housing Unit Density in New York City



Sources: U.S. Census, Neighborhood Change Database, NYU Furman Center

Figure 1.8: Decomposition of Citywide Density Changes by Decade, New York City



Sources: U.S. Census, Neighborhood Change Database, New York City Department of Finance Final Tax Roll Files, NYU Furman Center

Figure 1.8 divides overall changes in density by decade since 1970 into the change in the number of housing units and the change in the average number of people living in those units. Since 1970, the increase in the number of units was by far the larger contributor to increased population density. The large drop in population density during the 1970s came entirely from a reduction in the number of people relative to the number of housing units in the city, which coincided with a large increase in the city's vacancy rate. This is unsurprising given the long-lived nature of housing and relative rarity of demolition in any city. In fact, according to the U.S. Census Bureau, the number of housing units in the city increased slightly during the 1970s even as the

population declined. The growth in density in the 1980s was due in equal measure to increases in the housing stock and increases in the average number of people per housing unit. By the 1990s, the large increase in population density occurred primarily as a result of growth in new housing units (through construction and conversion from non-residential uses) and only secondarily due to a small increase in the number of people per unit. Although the increase in population density during the 2000s was much less pronounced, continued increases in the housing stock drove the increase in density. In fact, while the number of housing units increased by more than five percent in this period, the number of people per unit actually declined.

The maps in Figure 1.9 depict the geography of changes in housing density. The first panel depicts sub-borough level changes in housing unit density, revealing substantial variation underlying the citywide housing density shifts shown in Figure 1.8. The South Bronx and Central Harlem saw decreases in housing unit density consistent with the decline in population density seen in Map B of Figure 1.4. The East Bronx and Northern Queens both saw increases in housing unit density of between 2,000 and 4,000 units per square mile—modest changes when compared to the dramatic declines in housing unit density in Central Harlem and the South Bronx. The most substantial increases in the city all occurred in Manhattan south of 110th Street, where the increase in unit density surpassed 4,000 units per square mile in all sub-borough areas except the Lower East Side.

Table 1.3 focuses on the neighborhoods that lost more than 1,000 housing units per square mile of land during the 1970s. Morrisania/Belmont and Mott Haven/Hunts Point had the most dramatic losses, in excess of 30,000 units per square mile. This same decade also saw a decline in the number of people per housing unit, reflecting an increase in vacancy during this period. The simultaneous loss of units and increase in vacancies underpin these neighborhoods' staggering declines in population. While some of the housing stock in these areas had been built back by 2010, it was built at lower density levels than before the population loss of the 1970s.

B) The highest amounts of residential space per person in New York City are found in the high-density neighborhoods of Manhattan.

To a person on the sidewalk, the density of the built environment may be better captured by the total bulk of residential space than by the specific number of housing units. Map B in Figure 1.9 represents this aspect of density by showing the square footage of residential space per square mile of land in each sub-borough area. In 2010, this density of total residential space was by far highest in Manhattan, with a belt of higher built density in central Brooklyn and in the west Bronx. Staten Island and eastern Queens had the lowest density of residential square footage.

In 2010, the highest-density neighborhoods of Manhattan also had the highest amounts of space per person in the city. The combination of this high population density with relatively spacious units results in a built density unparalleled in the rest of the city (see Map B of Figure 1.9). Larger housing units (adjusted for number of occupants) are expected to some degree, given the higher-income residents of these neighborhoods, whose residents outbid others for central locations with shorter walks or subway rides to work. Notably, the higher per-square-foot prices and rents in these central areas have not totally counteracted this demand for larger units.

The final two panels in Figure 1.9 seek to capture how densely people live within their homes. Map C examines the number of people per housing unit in 2010 regardless of unit size. Jackson Heights and Elmhurst/Corona in Queens, Sunset Park and Borough Park in Brooklyn, and Mott Haven/

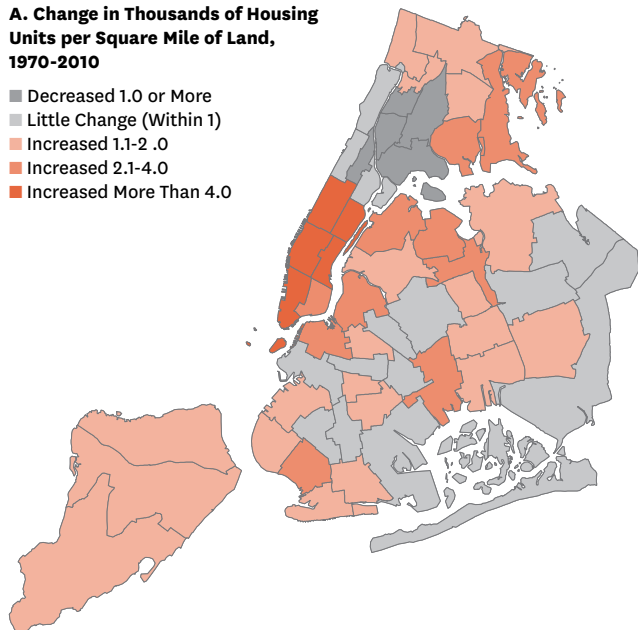
Table 1.3: Neighborhoods With Largest Declines in Housing Unit Density 1970-2010, New York City

	Change in Housing Units per Square Mile		Change in Population per Square Mile		Change in Population per Unit	
	1970-1980	1970-2010	1970-1980	1970-2010	1970-1980	1970-2010
102 Morrisania/Belmont	-35,363	-22,555	-142,664	-97,249	-0.63	-0.42
101 Mott Haven/Hunts Point	-30,650	-21,095	-121,023	-84,308	-0.43	-0.26
103 Highbridge/South Concourse	-10,897	-4,364	-29,401	1,423	-0.03	0.26
204 Bushwick	-10,134	-1,914	-51,204	-30,301	-0.46	-0.52
216 Brownsville/Ocean Hill	-9,709	-2,304	-61,013	-45,116	-0.72	-0.82
308 Central Harlem	-8,906	-8,892	-55,191	-42,482	-0.59	-0.36
104 University Heights/Fordham	-7,309	-4,453	-17,203	5,145	0.04	0.36
203 Bedford Stuyvesant	-5,422	4,181	-57,587	-35,790	-0.86	-0.89
302 Lower East Side/Chinatown	-5,216	4,217	-28,149	-18,096	-0.22	-0.38
309 East Harlem	-4,688	-992	-38,276	-32,374	-0.54	-0.60
208 North Crown Heights/Prospect Heights	-4,139	2,219	-40,054	-30,328	-0.58	-0.68
201 Williamsburg/Greenpoint	-3,023	12,070	-26,248	-3,964	-0.36	-0.62
206 Park Slope/Carroll Gardens	-1,791	1,806	-29,967	-33,781	-0.52	-0.76

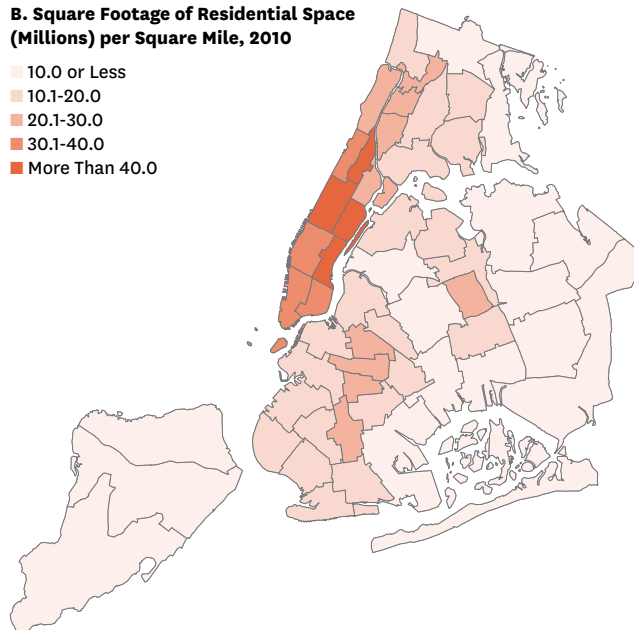
Sources: U.S. Census, Neighborhood Change Database, NYU Furman Center

Figure 1.9: Built Density in New York City**A. Change in Thousands of Housing Units per Square Mile of Land, 1970-2010**

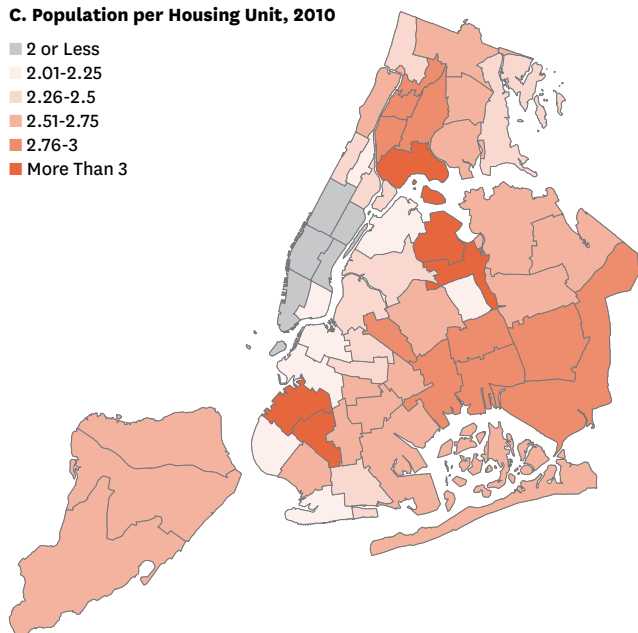
- Decreased 1.0 or More
- Little Change (Within 1)
- Increased 1.1-2.0
- Increased 2.1-4.0
- Increased More Than 4.0

**B. Square Footage of Residential Space (Millions) per Square Mile, 2010**

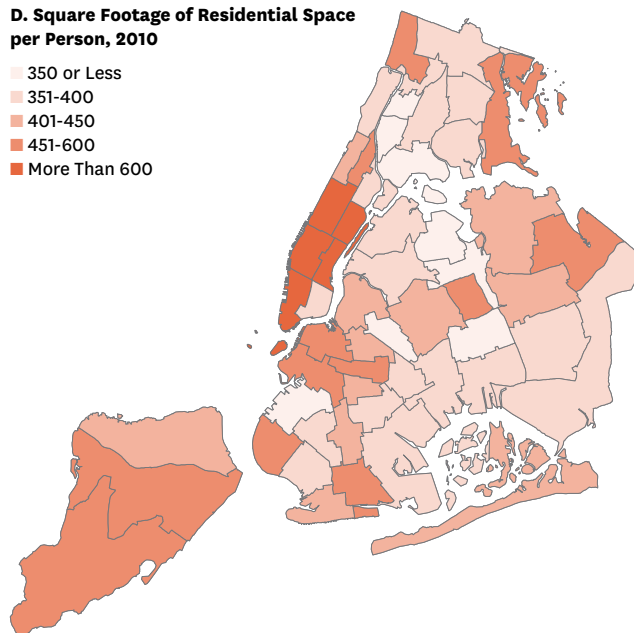
- 10.0 or Less
- 10.1-20.0
- 20.1-30.0
- 30.1-40.0
- More Than 40.0

**C. Population per Housing Unit, 2010**

- 2 or Less
- 2.01-2.25
- 2.26-2.5
- 2.51-2.75
- 2.76-3
- More Than 3

**D. Square Footage of Residential Space per Person, 2010**

- 350 or Less
- 351-400
- 401-450
- 451-600
- More Than 600



Sources: U.S. Census, Neighborhood Change Database, New York City Department of Finance Final Tax Roll Files, NYU Furman Center

Melrose in the Bronx are the only neighborhoods in the city that averaged more than three people per unit in 2010. Manhattan below Harlem generally had less than two people per unit on average. Map D shows the average square footage per person in each neighborhood, to give a better sense of the average living space neighborhood residents may enjoy. Residents of Riverdale/Fieldston and Throgs Neck/Co-op City

in the Bronx, northeastern Queens, and Staten Island—where commuting by car is more common—inhabited more than the average residential space in their homes in 2010. This is unsurprising, as prices and rents per square foot are cheaper farther from the main job centers in Midtown, the Financial District, and Downtown Brooklyn, and median incomes in these three areas are higher than the city median.

4. Population density in New York City is associated with certain positive neighborhood amenities and largely unrelated to many negative attributes.

Community residents often resist higher levels of density, voicing concerns about congestion and livability. But are denser neighborhoods associated with lower quality of life? We compare a number of indicators of neighborhood conditions and amenities across sub-borough areas with different levels of density.⁶ In New York City, greater density does not seem to negatively correlate with these indicators of New Yorker's quality of life. As compared to other New Yorkers, residents in higher-density neighborhoods enjoy shorter commutes and more retail options, while experiencing similar levels of crime and having access to similar quality schools. However, these relationships might be different when neighborhoods experience large increases in density over a short period of time.

A) Educational proficiency and measures of public safety do not strongly relate to density in New York City.

Education

While there were wide disparities across New York City neighborhoods in educational outcomes during the 2013-2014 school year, these disparities did not strongly correlate with neighborhood density, as Figure 1.10⁷ shows. The city's highest rates of proficiency on standardized tests given to students in third through eighth grade appeared in some of the highest-density neighborhoods in Manhattan and the lowest-density neighborhoods in Staten Island. Schools in higher-density neighborhoods actually had more teachers per pupil (lower student-teacher ratios) in the 2012-2013 school year, though the differences were fairly small.

6 In Figures 1.10 through 1.13, we divide sub-borough areas into five generally equally sized groups, or quintiles, of population density in 2010 (as measured by persons per square mile). In each figure, the indicator of neighborhood condition is the most recent version of that indicator available, and often represents conditions after 2010 when population density was last measured.

7 Performance is for the 2013-2014 school year, measured in 2014. The student-teacher ratio is for the 2012-2013 school year.

Public Safety

Figure 1.11 presents average crime rates of sub-borough areas in 2013 by quintile of population density in 2010.⁸ The lowest-density neighborhoods had the lowest average crime rates, most notably for violent crimes. Property crime did not increase with density, as neighborhoods in each of the four higher density categories had similar average crime rates. It appears that once a neighborhood density reaches a certain, fairly low, threshold of population density, there is no longer any correlation between density and crime.

There is no clear prediction for the relationship between vehicle collisions with pedestrians and population density. As with crime, the average collision rate was lowest in the least-dense neighborhoods in 2013. Collision rates increased as population density increased but then dropped off for neighborhoods in the highest density quintile, possibly reflecting a more subtle interaction between more cars and pedestrians but also slower driving speeds.

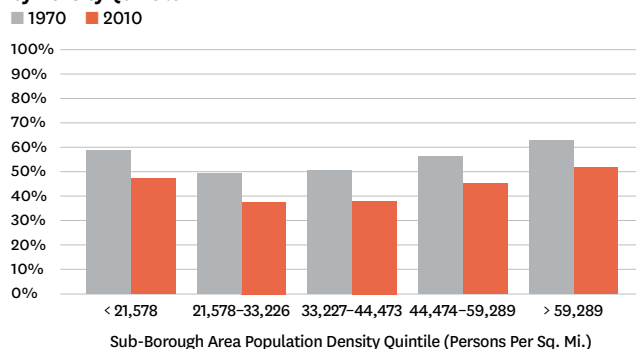
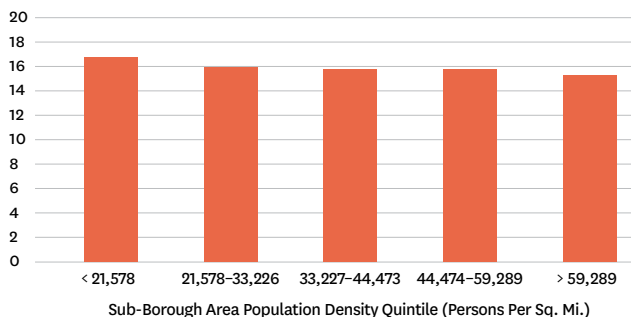
B) New York City's dense neighborhoods have slightly more retail options and shorter commute times.

Retail Goods and Services

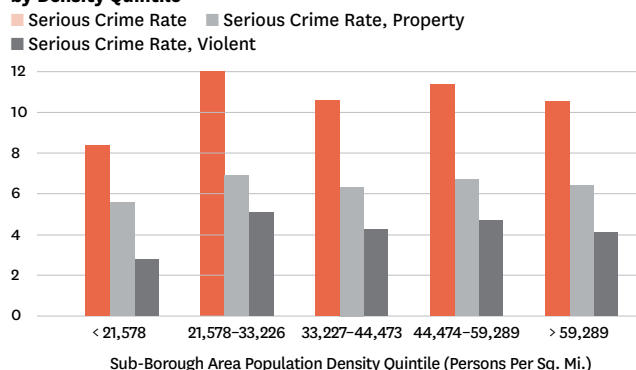
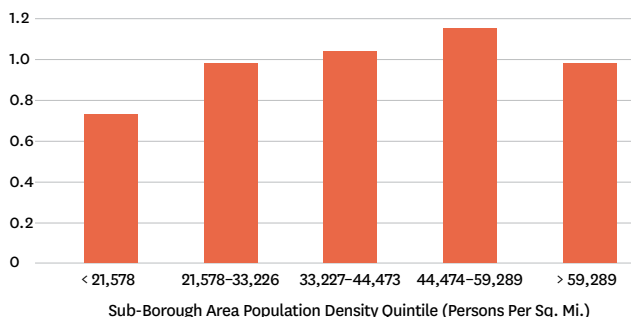
Figure 1.12 presents the number of frequently patronized retail establishments, or those serving everyday needs, relative to the combined resident and worker population by sub-borough area in 2010.⁹ The highest-density neighborhoods had the greatest retail availability: 5.7 establishments per 1,000 people, compared to 4.5 establishments per 1,000 people in the lowest density neighborhoods. The overall relationship of retail establishments to population density in the city was relatively consistent, however, in sub-borough areas with a density greater than the lowest quintile.

8 We present crime and retail establishments as a rate per 1,000 residents and non-resident workers. Including non-resident workers more accurately captures a neighborhood's ambient population and permits more accurate comparisons of these indicators across neighborhoods. For more information about this approach and how it applies to crime rates in particular, see Neighborhood Services and Conditions in Part 2.

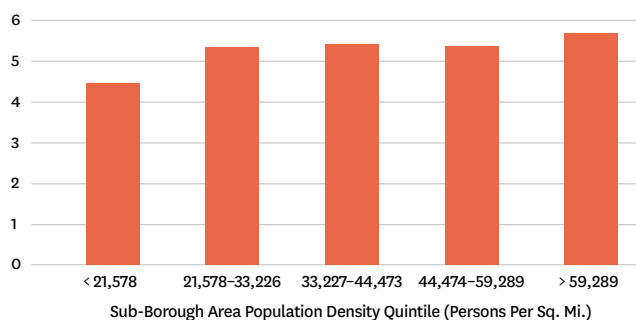
9 We define frequently patronized retail establishments as the following (NAICS codes in parentheses): hardware stores (44413); grocery stores (4451); specialty food and beverage stores (44521, 44522, 44523, 44529); beer and wine stores (4453); pharmacies, cosmetics, and health-related stores (44611, 44612, 44615, 446191); gasoline stations (44711); book stores (4512); department and general merchandise stores (4521, 4529); florists (4531); stationers (45321); gift stores (45322); pet stores (45391); banks and credit unions (52211, 52213); video rental stores (53223); fitness centers (71394); restaurants and bars (7221, 7222, 7224); barbers, salons, and other personal care services (81211, 81212, 81213, 812199); laundries and dry cleaners (81231, 81232).

Figure 1.10: Density and School Quality, New York City, 2013**Mean Percentage of Students Performing at Grade Level by Density Quintile****Mean Student-Teacher Ratio by Density Quintile**

Sources: New York City Department of Education, U.S. Census, Neighborhood Change Database, NYU Furman Center

Figure 1.11: Density and Public Safety, 2013**Mean Crime Rates (Per 1,000 Residents and Non-Resident Workers) by Density Quintile****Mean Pedestrian Collision Rate (Per 1,000 Residents and Non-Resident Workers) by Density Quintile**

Sources: New York City Police Department, U.S. Census, Neighborhood Change Database, NYU Furman Center

Figure 1.12: Mean Retail Establishments (Per 1,000 Residents and Non-Resident Workers) by Density Quintile

Sources: National Establishment Time Series, U.S. Census, Neighborhood Change Database, NYU Furman Center

These moderate-density neighborhoods had about the same number of establishments per resident and non-resident worker as sub-borough areas in the top quintile of population density.

Commuting Time

As shown in Panel A of Figure 1.4, the highest-density neighborhoods in New York City were primarily in or near the city's commercial centers. Although the high desirability of these central locations leads to their greater density, higher density can also support more efficient public transit investments that further reinforce this pattern. As Figure 1.13 shows, the typical worker living in one of the lowest-density sub-borough areas spent about 43 minutes commuting in 2011-2013. Meanwhile, her counterpart residing in one of the highest-density sub-borough areas got to work, on average, in a comparatively speedy 35 minutes.

5. Looking to the future: The next 15 years of growth appears unlikely to raise density much beyond what the typical New Yorker experienced in 1970.

After reversing population losses during the 1970s and growing steadily between 1980 and 2010, the city's population is likely to grow further. In 2013, the New York City Department of City Planning projected that the city's population will grow by approximately 578,000 people between 2010 and 2030 to reach a new high of 8.82 million.¹⁰ As explored above, changes in neighborhood population density varied widely, and we expect this trend to hold as the city continues to grow over the next decade and a half.

To assess how New Yorkers' experience of density may change in the future, we consider a scenario of how the growing population might spread across the city's neighborhoods. We add the projected 578,000 new residents to the city's tracts according to each tract's share of citywide population growth between 2000 and 2010, assuming that new population growth would follow the same trends seen in the previous decade. Tracts that grew more over that period would receive more of the population growth projected between

2010 and 2030.¹¹ Figure 1.14 shows how this growth scenario might affect the neighborhood population density that the typical New Yorker might experience by 2030.

If the projected population growth were to mimic the pattern observed during the 2000s, the typical city resident would live in a neighborhood with a population density of about 58,300 people per square mile in 2030. This is marginally higher than the median experienced density in 1970 of around 57,900 people per square mile. If the projected population growth were instead to be spread more uniformly across the city's neighborhoods, the median experienced density would increase less.

6. Conclusion

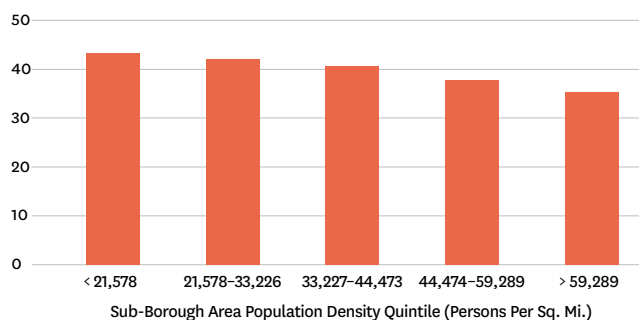
The renewed attractiveness of New York City since the 1970s means population will likely keep increasing, and so will population and housing density. In 2010, few other U.S. cities had any neighborhoods that matched the density experienced by the typical New Yorker. Yet, by recent historical standards, today's density levels are not extreme. In recent years, the typical New Yorker lived in a lower-density neighborhood than the typical New Yorker in 1970, as population growth in the city since 1980 was focused in moderate-density neighborhoods. Further, while great disparities in education and crime across neighborhoods exist, these differences are not generally associated with density levels.

High density cities like New York are playing an increasingly important role in the economy as drivers of productivity and innovation. This means the accessibility of the city to new residents is important both for New Yorkers and the nation. We have demonstrated that significant numbers of new residents can be accommodated without elevating density to levels above what the city has historically experienced, and that high-density neighborhoods do not perform lower on key quality of life indicators. City officials will need to ensure that neighborhoods have sufficient infrastructure to accommodate their new residents.

¹⁰ New York City Department of City Planning, *New York City Population Projections by Age/Sex & Borough, 2010-2040* (2013), http://www.nyc.gov/html/dcp/pdf/census/projections_report_2010_2040.pdf.

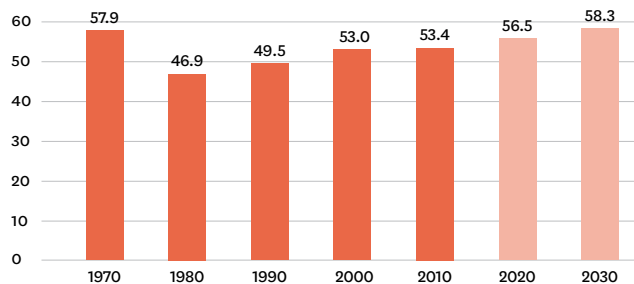
¹¹ Mathematically, we calculate the tract's share of the citywide population growth between 2000 and 2010, and then multiply it by the projected increase of 578,000 people to estimate the population growth in that tract. For example, if a tract's population growth between 2000 and 2010 accounted for one percent of the city's population growth during that decade, we would assign one percent of the projected population increase (5,780 people) between 2010 and 2030 to that tract.

Figure 1.13: Density and Mean Travel Time to Work (Minutes), New York City, 2013



Sources: U.S. Census, Neighborhood Change Database, NYU Furman Center

Figure 1.14: Median Neighborhood (Tract) Population Density Experienced by New York City Residents Projected Through 2030
Assuming Projected Growth of 578,000 People Is Distributed According to Tract Population Growth Between 2000–2010



Sources: U.S. Census, Neighborhood Change Database, NYU Furman Center

About the NYU Furman Center

Established in 1995, it is a joint center of the New York University School of Law and the Robert F. Wagner Graduate School of Public Service. Its mission is to:

Provide objective academic and empirical research on the legal and public policy issues involving land use, real estate, housing, and urban affairs in the United States;

Promote frank and productive discussions among elected and appointed officials, leaders of the real estate industry, leaders of non-profit housing and community development organizations, scholars, faculty, and students about critical issues in land use, real estate, and urban policy;

Present essential data and analysis about the state of New York City's housing and neighborhoods to those involved in land use, real estate development, community economic development, housing, urban economics, and urban policy;

Train the next generation of urban policy leaders by creating an environment where students meaningfully contribute to the Center's interdisciplinary projects and research.

Ingrid Gould Ellen, Paulette Goddard Professor of Urban Policy and Planning, is the Center's Faculty Director.

Mark Willis is the Center's Executive Director and Resident Research Fellow. The Center's staff regularly collaborates with faculty and researchers from the School of Law, the Wagner School of Public Service, the Faculty of Arts and Sciences, and many other research organizations at NYU and beyond.

The NYU Furman Center is named in honor of NYU Law alumnus Jay Furman, class of '71, an international real estate investor and developer. Mr. Furman provided generous financial support to endow the Center, and remained very involved in the Center's work as a constant source of support, ideas, and inspiration. This year's *State of New York City's Housing and Neighborhoods in 2014* report is dedicated to him.

The NYU Furman Center received the prestigious MacArthur Award for Creative and Effective Institutions in 2012. This distinguished award recognized the Center's excellence in providing objective, policy-relevant research and analyses to address the challenges facing New York City and other communities across the nation.

The NYU Furman Center launched the Moelis Institute for Affordable Housing Policy in 2010 to improve the effectiveness of affordable housing policies and programs. The Institute is named for NYU Law alumnus Ron Moelis, class of '82, an affordable housing developer who provided financial support.

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