RATIONALE FOR CREATING ALTERNATIVES TO CENSUS ESTIMATES OF BOSTON'S POPULATION

City of Boston Planning Department Research Division

INTRODUCTION

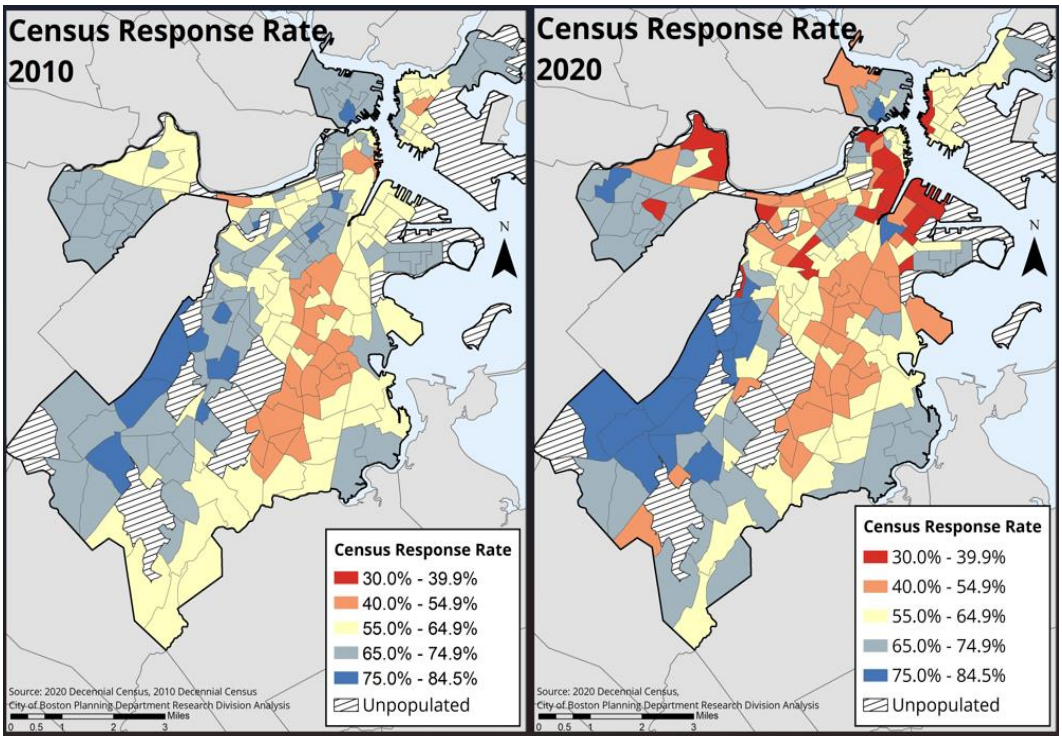
COVID-19 pandemic disruptions caused the Census Bureau to undercount Boston's 2020 population by approximately 25,000 people, and perennial difficulties in counting Boston's highly mobile young adult population has exacerbated Boston's undercounted population by an additional 15,000 people in the 2024 American Community Survey. Unless these problems are resolved, Boston's population will continue to be undercounted by the Census Bureau until the 2030 Census, and any Boston planning efforts will inadequately address their intended purpose because of this estimated 40,000 missing people.

PROBLEMS WITH THE 2020 CENSUS

The 2020 Census showed a lower population for Boston (675,647) than prior population estimates (692,600 in 2019), and there are serious concerns that both the group quarters and household populations were undercounted due to problems related to the COVID-19 pandemic. In mid-March, colleges and universities evacuated their campuses before the April 1, 2020 Census count due to the pandemic, but Census guidelines required these students to be counted in Boston. Boston successfully challenged the 2020 Census Group Quarters

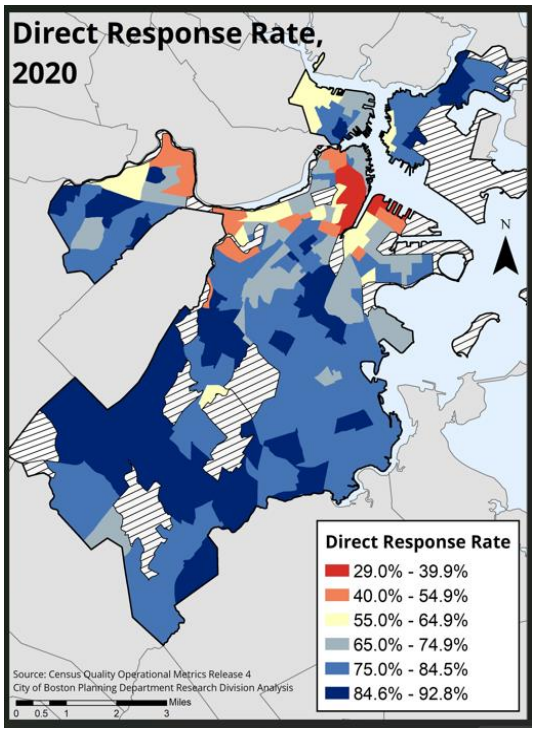
count using data from colleges and universities and the Suffolk County Sheriff's Department showing an undercount of 6,290 dormitory and correctional facility residents. This additional group quarters population would bring Boston's 2020 population to 681,937.

Low household self-response rates in the 2020 Census due to the pandemic likely led to undercounting of household population as well. The maps below show the household self response rates in 2010 and in 2020.

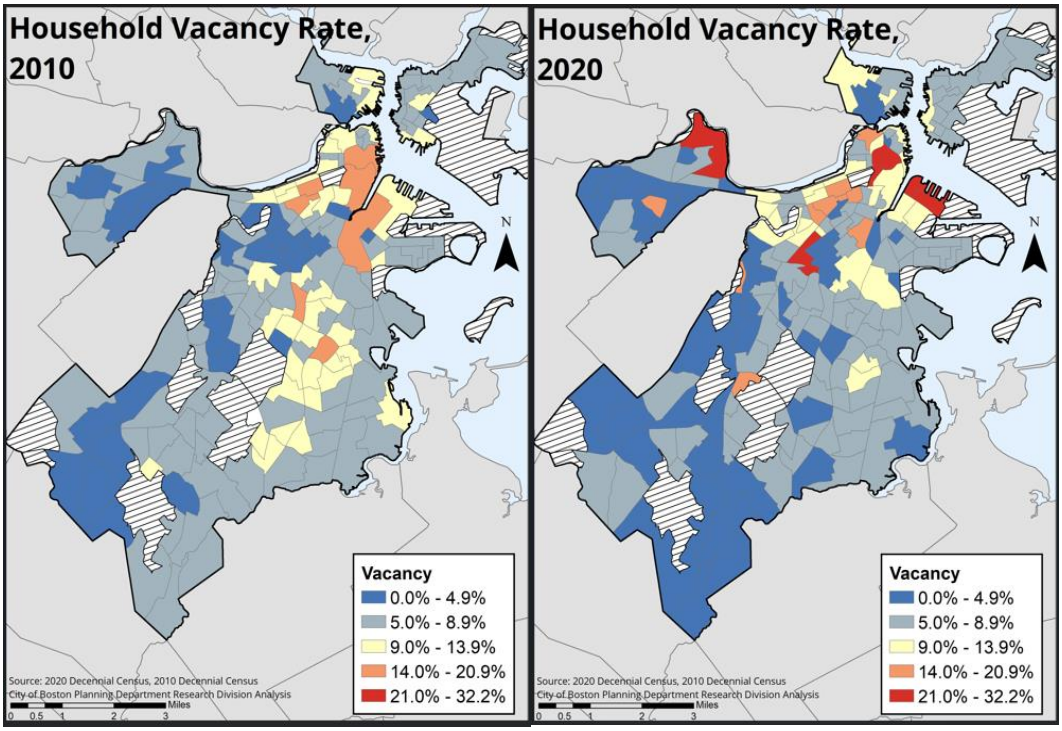


Even after follow-up operations in 2020, some Census tracts in Allston, Downtown, and South Boston Waterfront had direct household responses from less than half of the housing units.[1]

[1] The Non-response Follow-up (NRFU) operation reached out to households that did not submit a census questionnaire between August 11 and September 30, 2020. Census takers knocked on the doors of addresses that did not self-respond to the 2020 Census to complete a questionnaire or verify whether the address was vacant. With occupied housing units, the NRFU had three possible outcomes. (1) An interview with someone in the household to complete a census questionnaire. (2) An interview with a proxy: If census takers couldn't get a response directly from a household after three visits, they tried to get information about the address from a proxy such as a neighbor, landlord, or building manager. (3) Administrative records: If they couldn't reach the household, the Census Bureau attempted to use high-quality, existing records about the household. It is clear that in a pandemic year for highly mobile neighborhoods these follow-up methods were unlikely to capture the full population.



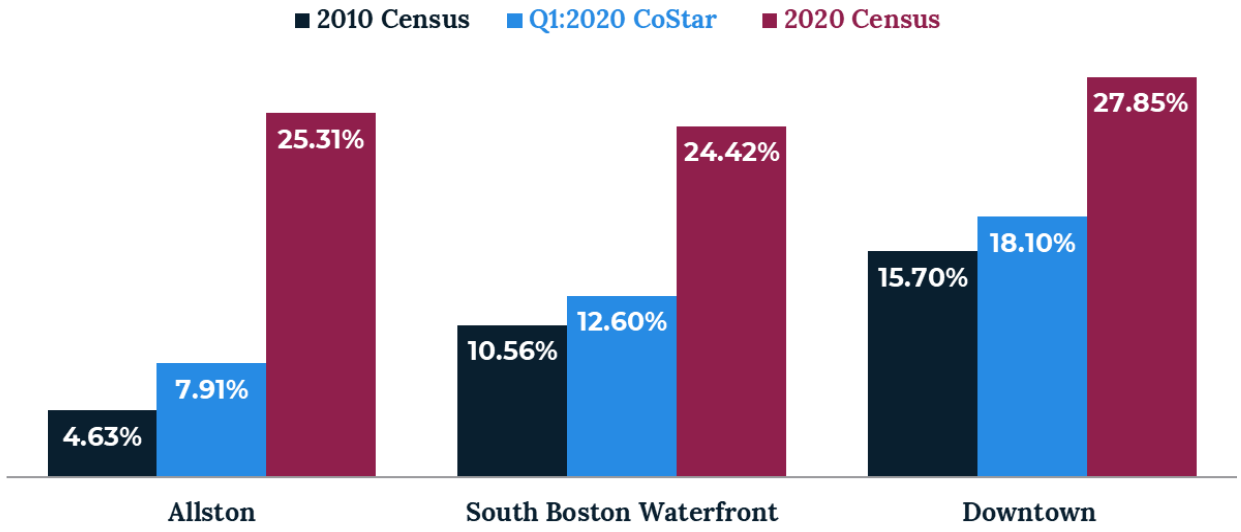
The 2020 Census assigned high vacancy rates to tracts with low response rates. The maps below show significantly higher vacancy rates in the 2020 Census compared to the 2010 Census in tracts with low rates of direct household responses (a household member provided information) to the 2020 Census.



In contrast to the 2020 Census vacancy data, CoStar real estate data on multi-family buildings with 5+ units show low vacancy rates in Boston at the time of the 2020 Census (April 1, 2020). The Q1 2020 multi-family vacancy rate for Boston was just 6.0%. Note that Census Bureau guidelines indicated that people who left their Boston apartments temporarily in the two weeks between the pandemic lockdown in mid-March and Census day on April 1st should be counted as living in Boston on April 1st.

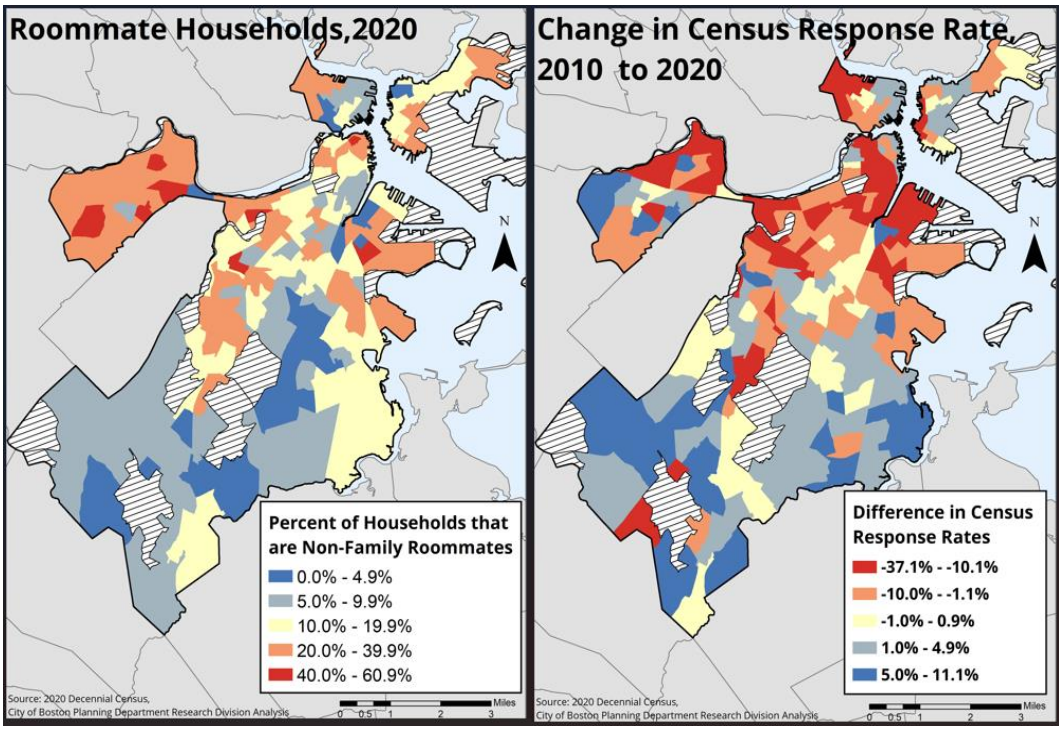
The 2020 Census showed much higher vacancy rates for certain tracts than either the 2010 Census or the contemporaneous real estate data. At 2010 Census tract vacancy rates, 2020 Census count of households would have been higher: 512 additional households in tract 606.03 & 606.04 (South Boston Waterfront), 353 additional in tracts 303.02 & 701.02 (Downtown), and 196 additional in tract 8.06 (Allston).

VACANCY RATES

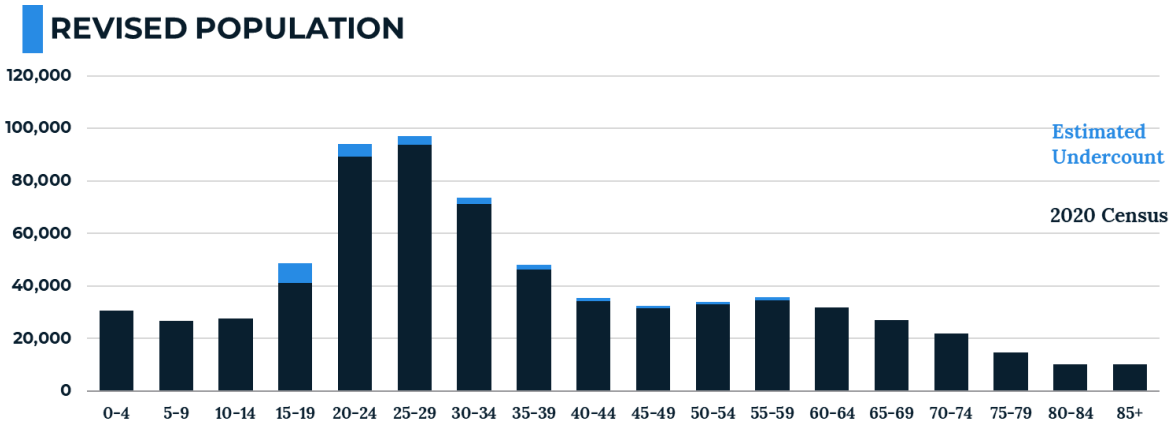


Source: CoStar, 5+ unit buildings only, 2010 and 2020 Decennial Census, Tracts 606.03 and 606.04, City of Boston Planning Department Research Division. Note: Submarkets in Allston, Downtown, and South Boston Waterfront are represented by Census Tracts 8.06; 303.02 and 701.02; and 606.03 and 606.04, respectively.

Who may have been missed? The 2020 Census had lower self-response rates in areas with high shares of roommate households, common among young adults.

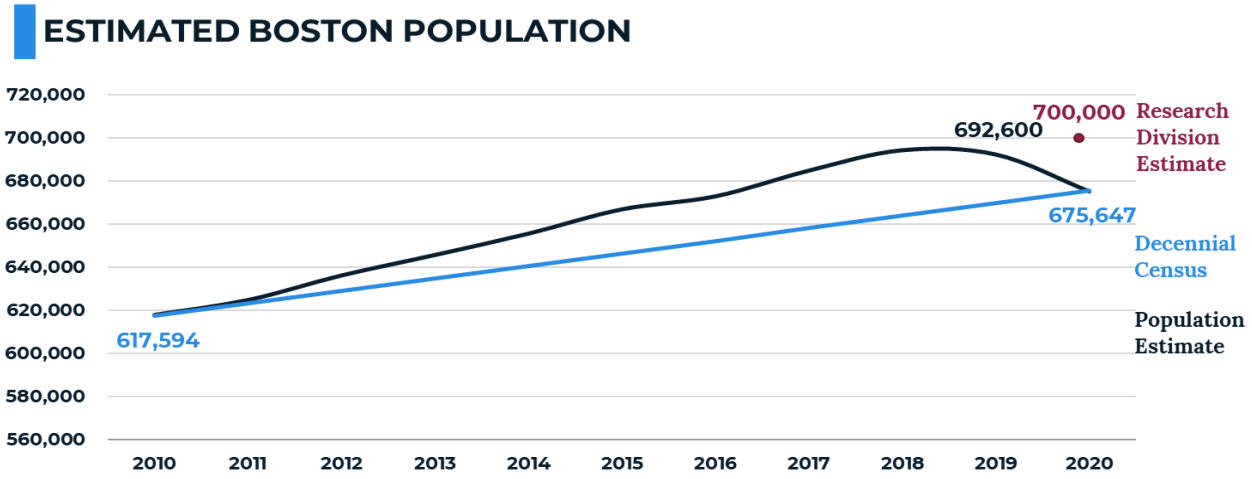


The Planning Department's Research Division created a 2020 population estimate for Boston that incorporates undercounted group quarters and household populations. The undercounted population is estimated to be primarily in the 15-34 age groups. The revised population by age group is shown in the graph below.



Source: U..S Census Bureau, 2020 Decennial Census and City of Boston Planning Department Research Division.

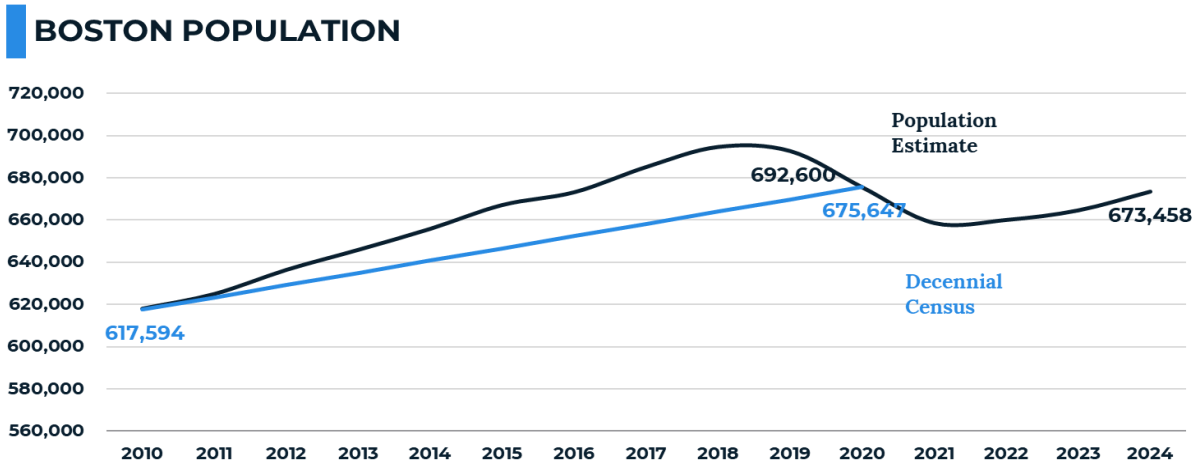
Adjusting for the undercount of the group quarters and household populations brings Boston's population in 2020 to almost 700,000. The graph below shows the Boston Planning Department's Research Division estimate for 2020, which is consistent with the 2019 annual Census population estimate (prior to the pandemic disruptions).



Source: US Census Bureau, 2010 and 2020 Decennial Censuses, 2010-2020 annual population estimates; City of Boston Planning Department Research Division 2020 population estimate.

The 2021-2024 Annual Estimates of the Resident Population suggest that Boston's population fell significantly and has yet to recover, but is this accurate?

PROBLEMS WITH POST-PANDEMIC POPULATION ESTIMATES



Source: 2010 & 2020 Decennial Census & Vintage 2019 & 2024 Population Estimates, City of Boston Planning Department Research Division Analysis.

College, housing, and other data suggest a brief decline in Boston's population, followed by recovery in the fall of 2021:

1) Boston's 2020 population was undercounted in the Decennial Census due to COVID-19 mitigation policies,

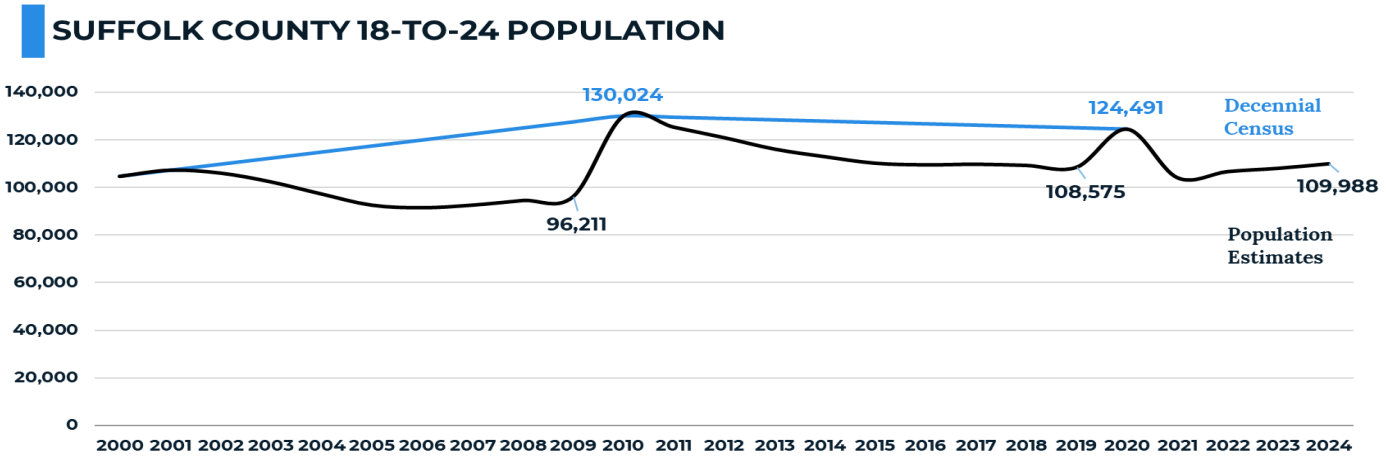
2) Hybrid college instruction, changing workforce policies, and reduced immigration decreased the resident population from April 2020 to September 2021,

3) By September 2021 Boston's population recovered as college enrollment returned to full in-person operations and more workers were required to work in-person.

The following sections will go through the data underlying the Research Division's concerns about decreasing Census Bureau's annual population estimates this decade and the methodology for revised estimates of Boston's population.

DIFFICULTY IN COUNTING YOUNG ADULTS, ESPECIALLY STUDENTS - EVIDENCE FROM COLLEGE DATA

Even before the pandemic the Census Bureau's annual population estimate methodology using administrative data consistently undercounted Suffolk County's 18-24 population[2]. In the graph below, one can see that in 2009 the Census Bureau estimated only 96,211 18-24 year olds in Suffolk County whereas the 2010 Census count found 130,024 - suggesting that the Census estimate methodology undercounted 18-24 year olds in Suffolk County by ~30,000 residents (~23%). The 2010 Census reset the population of young adults but the estimates then began to decrease again, as they did in the 2000s, as the young adults who were 18-24 in 2010 aged out of the cohort or migrated out of the city. It is true that many college students do not remain in Boston after completing their educational experience. However, this student population is replaced with new or rising students each year, resulting in an 18-24 age cohort in which the majority of the population remains stationary and does not age. The Census methodology fails to account for this ever repopulating cohort of young adults in a city with many institutions of higher education.



Source: US Census Bureau, 2000, 2010, & 2020 Decennial Censuses, 2000-2024 annual population estimates for Suffolk County, Boston Planning Department Research Division Analysis.

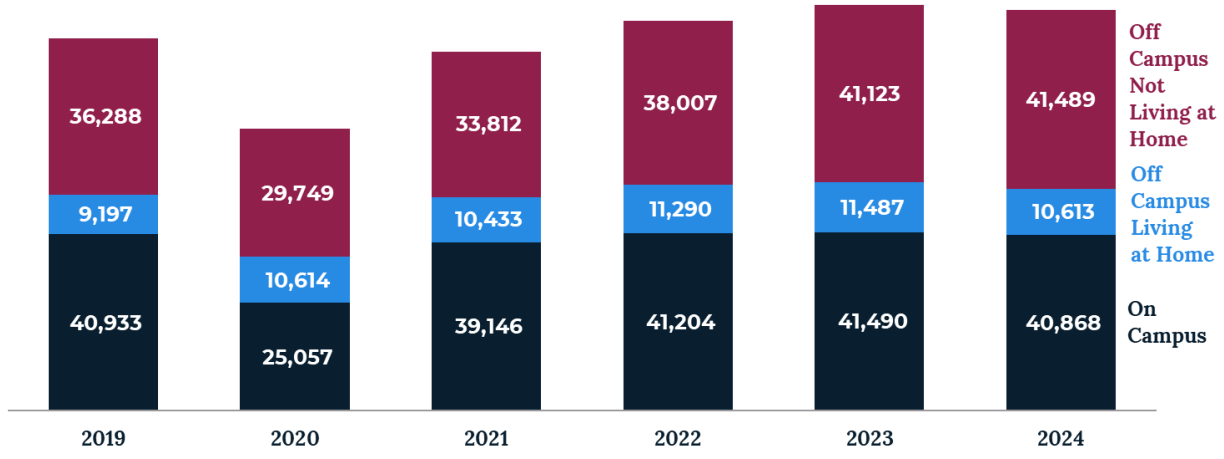
Despite pandemic related undercounts, the 2020 Census counted 124,491 18-24 year olds in Suffolk County - almost 16,000 (15%) more than the 2019 estimate. Accounting for the pandemic-related

[2] We report the Suffolk County Annual Estimate of the Resident Population because these data are the Census Bureau's preferred estimate, and they are released by age. Detailed age data are not reported for Boston, which receives only a total population estimate. These estimates are preferred by the Census Bureau because they use administrative data and differ from the American Community Survey's sample data that reports margins of error.

undercount of group quarters and household population sets the 2020 population at ~12,000 higher, bringing the discrepancy with the 2019 estimate to ~28,000, almost the same gap as in 2009-2010.

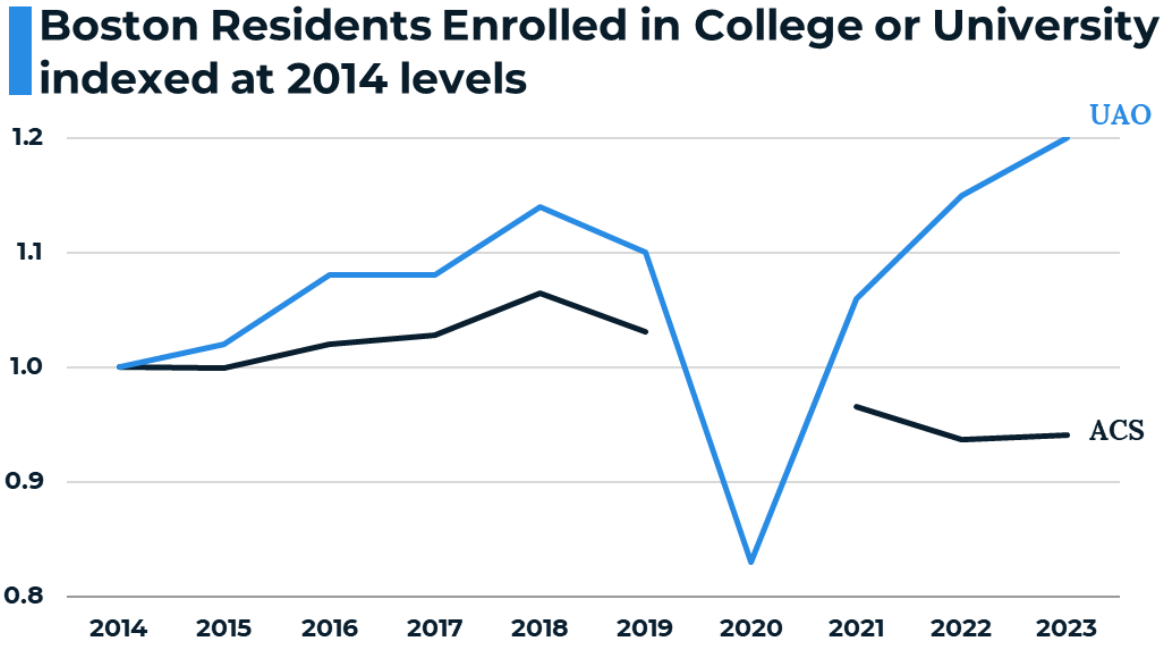
While the estimation of the college-age population has been a long standing issue, pandemic disruptions in 2020-2021 exacerbated the problem. Data from colleges suggest the Boston student population fell in fall 2020 when many college campuses were not operating at full capacity, but then rebounded in fall 2021 when most colleges resumed normal operations. The graph below gives the fall enrollment of college students living in Boston and attending Boston colleges. The data submitted to the City by colleges and universities show the Boston resident enrollment largely rebounded in fall 2021 and by fall 2022 was higher than in 2019.

COLLEGE STUDENTS LIVING IN BOSTON



Source: University Accountability Ordinance data, Research Division Analysis, Note: does not include Community College students or Boston residents enrolled in colleges located outside of Boston.

The American Community Survey estimates of college-enrolled Boston residents for 2021 and 2022 do not reflect the rebound of college students living in Boston in the fall of 2021. The 2023 ACS reports a number of college students in Boston that is 5.1 percent below 2014 levels while the University Accountability Ordinance data (reported directly by colleges to the City of Boston) reports a number of college students in Boston that is 19.9 percent above 2014 levels. This discrepancy amounts to a possible undercounting of Boston college students in 2023 by approximately 20,000 students.



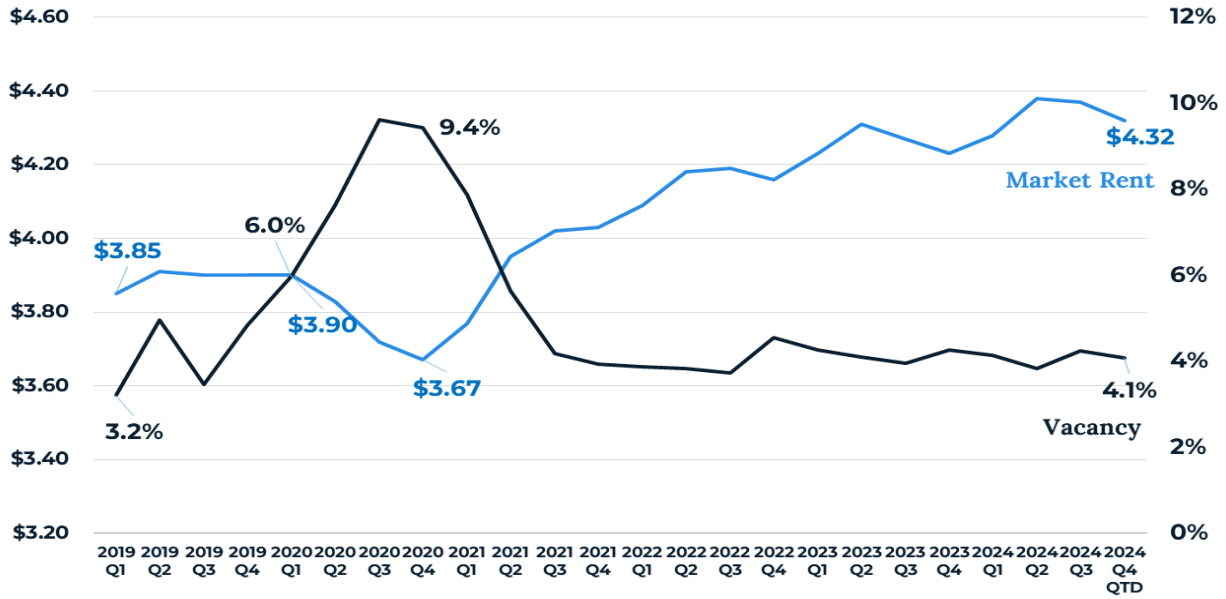
Source: UAO and ACS 2014-2023, City of Boston Planning Department Research Division Analysis. Note: ACS data are from monthly surveys and no data are available for 2020; UAO data are from Fall enrollment of the given year.

REBOUNDING RESIDENTIAL DEMAND - EVIDENCE FROM REAL ESTATE MARKET

Residential vacancy and rent data suggest Boston's household population may have fallen in 2020, but rebounded by fall 2021. The graph below shows the vacancy rate and market asking rents for apartments in buildings with five or more units.

MULTIFAMILY MARKET ASKING RENT AND VACANCY

Market Asking Rent (per square foot) and Vacancy Rate



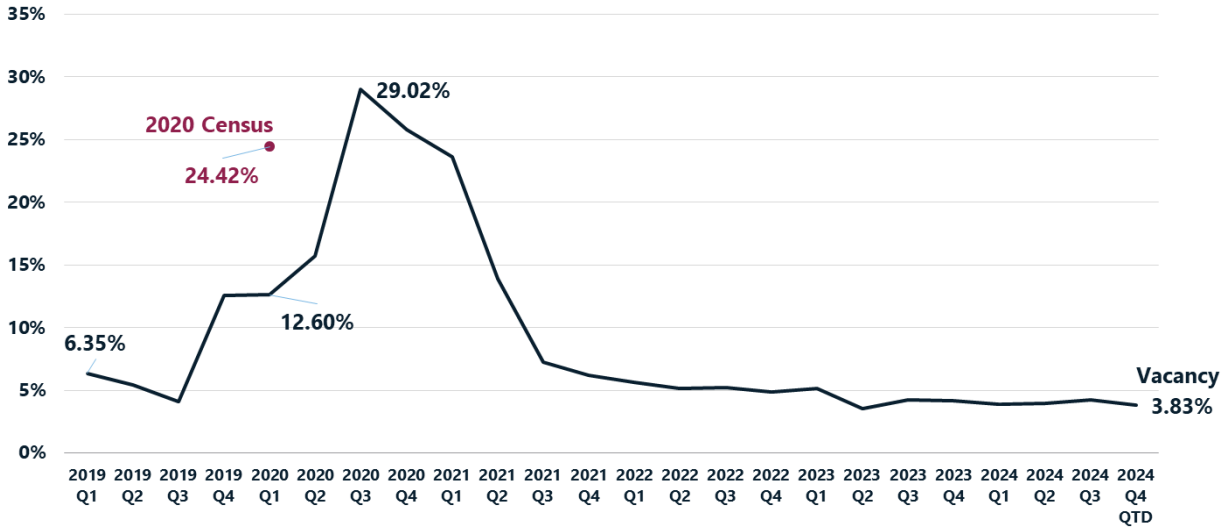
Source: CoStar, buildings with 5+ units, nominal dollars.

Low vacancy rates and increasing rents despite the growing number of housing units suggest a growing household population. Vacancy rates in large multi-family buildings (5+ units) show increased vacancies in 2020 and 2021 that had largely resolved by 2022. The average monthly vacancy rate in 2022 was 3.6%, nearly the same as the pre-pandemic level. This low vacancy rate is not consistent with the Census estimates of a declining population, especially given the robust rate of housing construction over that past few years. Approximately 15,100 new housing units have been built in the four years from the end of 2019 to the end of 2023. Despite this new construction, vacancy rates have returned to low pre-pandemic levels and rents have been rising, suggesting strong residential demand not consistent with a falling population.

880 net new units of housing came online in the South Boston Waterfront in post-Census 2020. Despite this housing growth, vacancy rates have fallen.South Boston Waterfront tracts recovered to pre-pandemic vacancy levels by Q3 2021, and recent vacancy rates are below 4%.

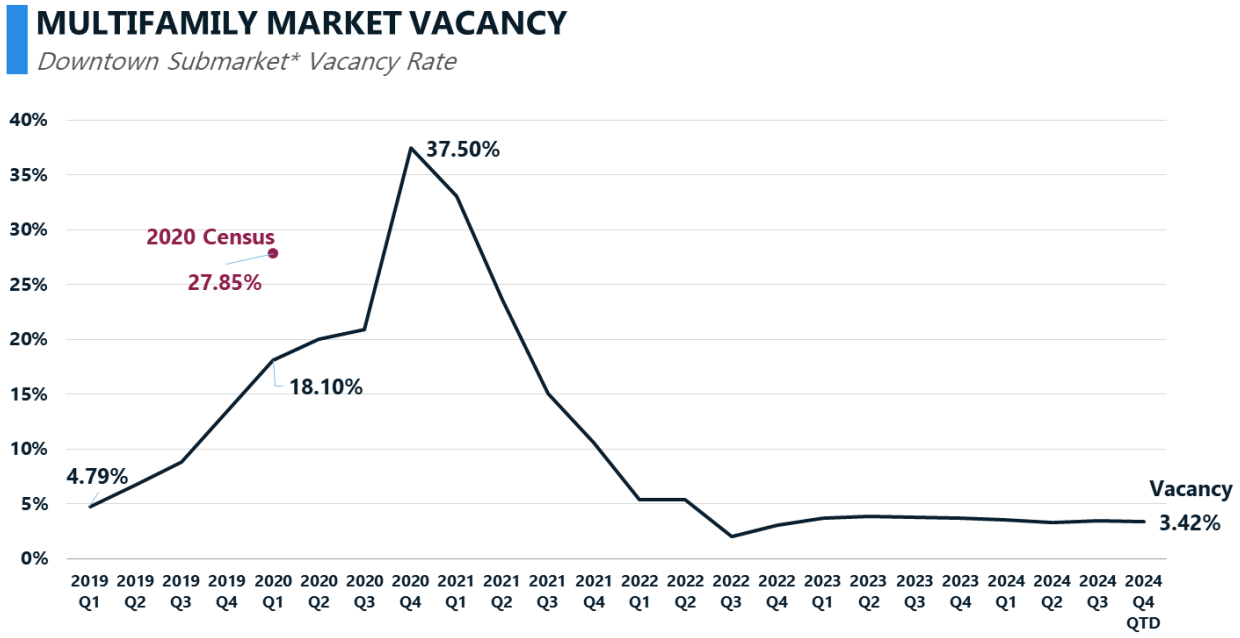
MULTIFAMILY MARKET VACANCY

South Boston Waterfront Submarket Vacancy Rate*



Source: CoStar, 5+ unit buildings only, and 2020 Decennial Census, Tracts 606.03 and 606.04, City of Boston Planning Department Research Division.

Despite the construction of 433 net new units of housing since April 1, 2020, vacancy rates have fallen in Downtown Boston tracts. Downtown tracts recovered to pre-pandemic vacancy levels by Q1 2022. Recent vacancy rates are below 4%.



Source: CoStar, 5+ unit buildings only, and 2020 Decennial Census, Tracts 303.02 and 701.02, City of Boston Planning Department Research Division.

Across the city, new housing construction, rising rents, and low vacancy rates point to strong residential demand that has fully recovered from the pandemic and that points to a growing population.

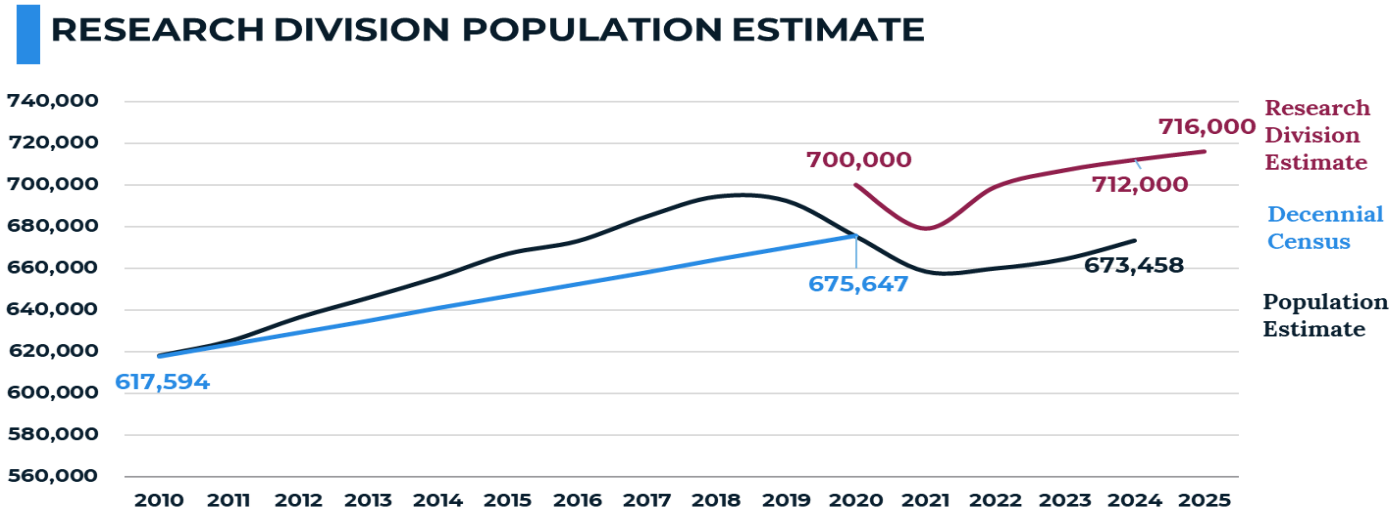
ADDRESSING ISSUES WITH POST-CENSUS ESTIMATES OF BOSTON'S POPULATION

Census estimates showing a declining population for Boston are not consistent with other data sources and raise ongoing concerns about the accuracy of Census estimates of Boston's population. The 2020 Census undercounted both household and group quarters populations due to the pandemic disruptions. The post-census annual population estimates and American Community Surveys show further population decline. The 2023 estimate is 3.2% lower than the official 2020 Decennial Census count of 675,647, suggesting a persistent loss of approximately 21,814 residents from 2020. However, other data about housing, college enrollment, and employment show population rebound after September 2021. The disconnect between Census population estimates and actual population is a significant problem for the City's planners and

policy makers. The problem is likely to get worse as 5-year American Community Survey data, on which planners rely for neighborhood-level data, transition to full post-Census, post-pandemic cohorts. The 2019-2023 ACS data show some neighborhoods shrinking (despite evidence to the contrary), but the 2020-2024 ACS data are likely to show even more population loss unless steps are taken to rectify the data limitations.

ALTERNATE POST-CENSUS POPULATION ESTIMATES

The Planning Department Research Division has developed alternative population estimates for Boston, by age group and by neighborhood. The Research Division has created revised citywide total population estimates through January 2024 as shown in the graph below. Boston's population was undercounted in the 2020 census, then fell during the pandemic but rebounded by 2022 - a recovery the Census estimates have not yet captured.



Source: US Census Bureau, 2010 and 2020 Decennial Censuses, 2010-2020 Annual Population Estimates; City of Boston Planning Department Research Division 2020-2025 population estimate.

Based on compelling evidence from multiple data sources, the Research Division estimates that Boston's population in 2024 was ~712,000, showing a complete recovery from the short-term population loss caused by the onset of the pandemic. This alternate estimate is significantly higher than the 2024 Census Annual Estimate of the Resident Population of 673,458.

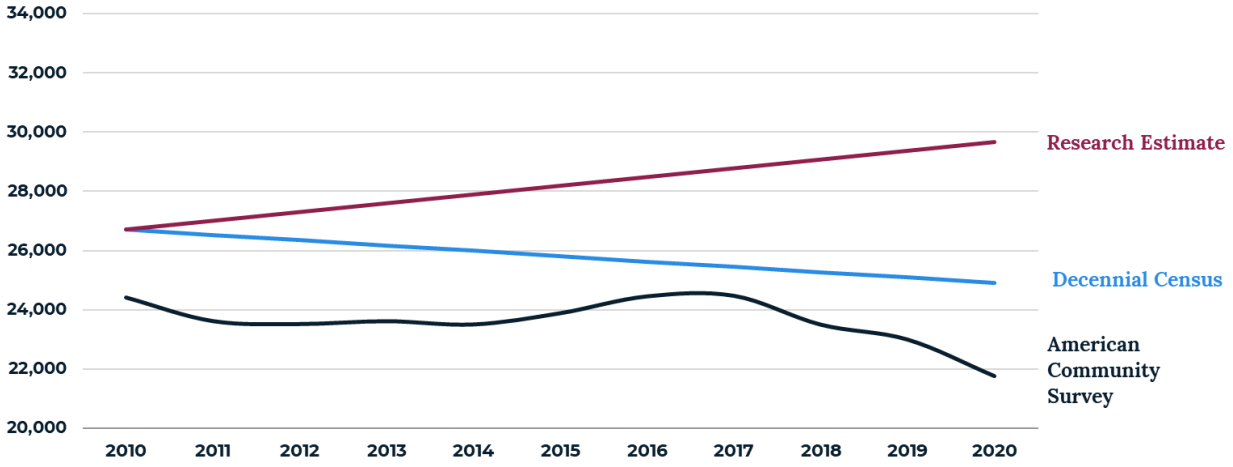
ALLSTON CASE STUDY

The Planning Department Research Division has created alternate population estimates for Boston's neighborhoods to help planners and policymakers. The Allston neighborhood is a good case study of the need for these alternate population estimates. The Census Bureau's American Community Surveys, which are controlled by the Annual Estimate of the Resident Population, have been significantly undercounting Allston's population for many years. Allston's household population is particularly hard to count since 40 percent of the adult household population are living in a roommate household without family members or romantic partners[3]. These households are highly changeable from month to month and may be less likely to complete surveys. In addition, comparison to the 2020 Census is problematic because the definition of residency differs between the decennial census and the ACS. The 2020 Census defined residency as where a person lives and sleeps most of the time. According to the ACS, a person is considered a resident if he or she has been or will be staying at an address for more than two months of the year, meaning anyone residing at an address for less than two months is not included in the survey data. Many households in a neighborhood like Alston have a highly mobile population that is similar to single-room occupancy of years gone by.

The Decennial Census, with its increased resources for counting each individual, has done a better job of counting mobile student populations in areas such as Allston. The 2010 Census counted 26,713 Allston residents, at a time when the American Community Surveys (2008-2012) were only estimating an Allston population of 24,425 - a possible undercount of 2,288 or 8.6 percent. Despite the challenges of conducting a census during a pandemic, the 2020 Census counted 24,904 Allston residents. The group quarters challenge adjustment brought Allston's population to 27,533 and adjusting for the undercounted household population brings Allston's 2020 population to 29,668. The American Community Surveys of the time (2018-2022) were only estimating an Allston population of 21,762 - an undercount of 7,906 or 27 percent.

[3] U.S. Census Bureau, 2019-2023 American Community Survey, B09021, Research Division Analysis

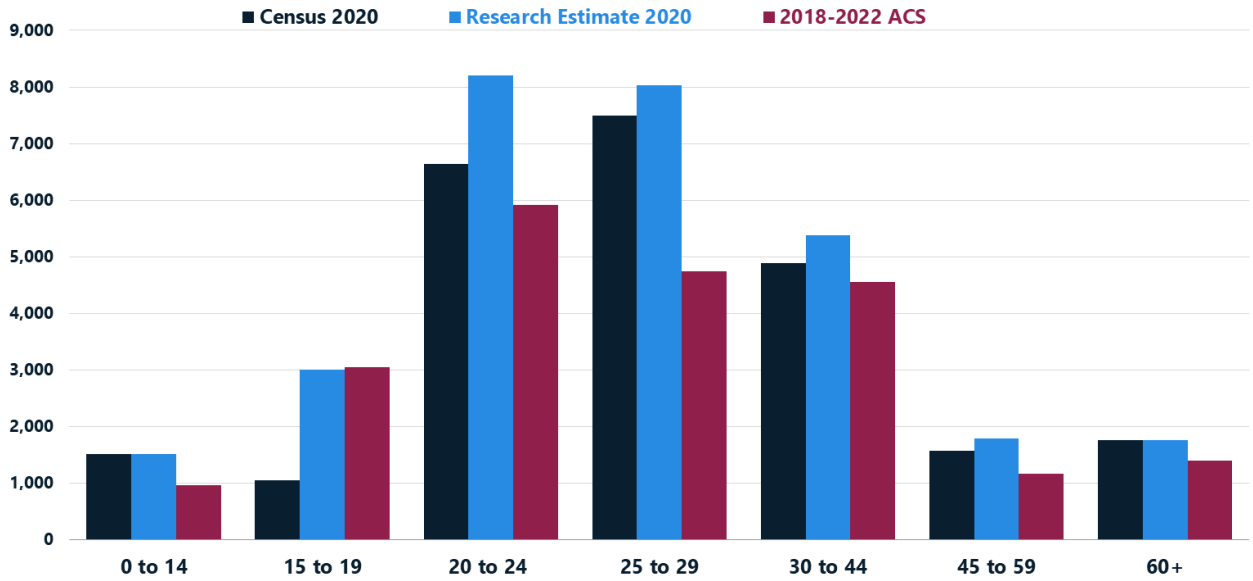
ALLSTON POPULATION: DECENNIAL CENSUS, ACS, & RESEARCH DIVISION ESTIMATE



Source: Research Division Estimates, U.S. Census Bureau 2010 and 2020 Decennial Census & 2010-2022 5-Year ACS, City of Boston Planning Department Research Division Analysis.

The Research Division broke down the alternate 2020 population estimate for Allston by age group, showing that the 2020 Census and the 2018-2022 ACS significantly underestimated the young adult population in Allston.

ALLSTON'S 2020 POPULATION ESTIMATE BY AGE: DECENNIAL CENSUS, COB RESEARCH DIVISION, AND 5-YEAR ACS

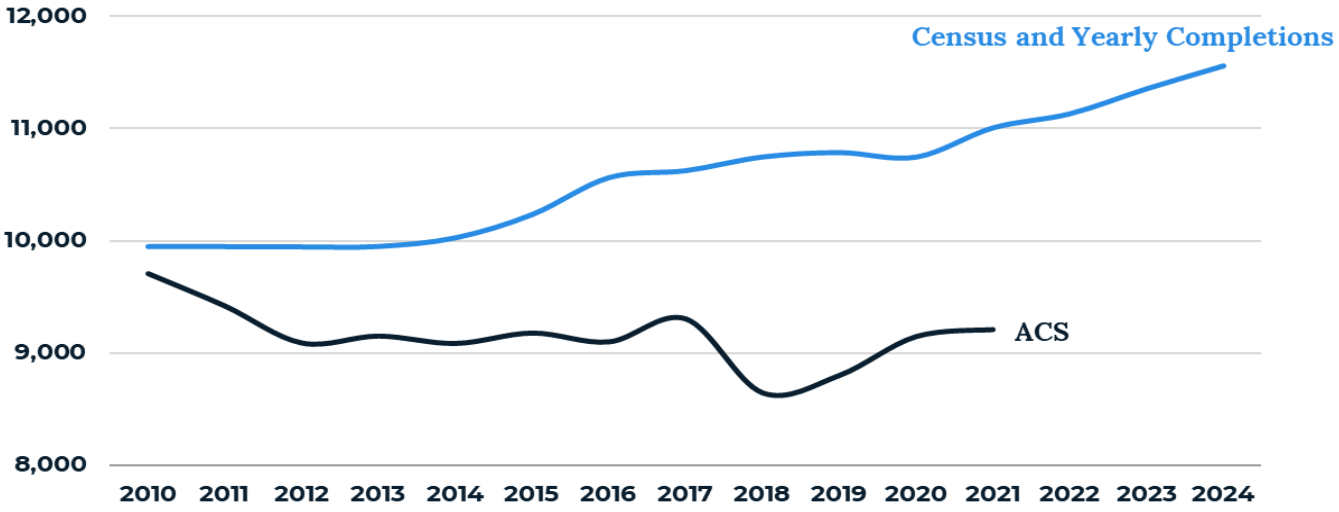


Source: 2020 Decennial Census, 2018-2022 5-Year ACS, City of Boston Planning Department Research Division Analysis.

The Research Division believes that the population of Allston, as previously shown for the city, dipped after the Census through the 2020-2021 school year when college campuses and many offices were not operating at full in-person capacity. The Research Division believes that Allston's population recovered by September 2021 when the colleges returned to full on-site operations. Since then, Allston's population has grown further.

One indication of Allston's growing population is the growth in housing. The ACS has increasingly underestimated the amount of housing in Allston. The 2010 Census counted 9,949 housing units in Allston, at a time when the American Community Surveys were only estimating Allston housing units of 9,704 - an undercount of 2.5 percent. Subsequent ACS estimates of Allston's housing vary significantly - showing growth over some periods but improbable decline over other periods. The 2020 Census counted 10,748 housing units in Allston. The American Community Surveys of the time were only estimating Allston housing at 9,142 - an undercount of 1,606 or 15 percent. In an indication of continued growth, data from the Mayor's Office of Housing show that at the end of 2024 Allston had 11,760 units of housing. The most recent population estimate for Allston from the ACS is based on ~2,600 fewer housing units than we know Allston now actually has.

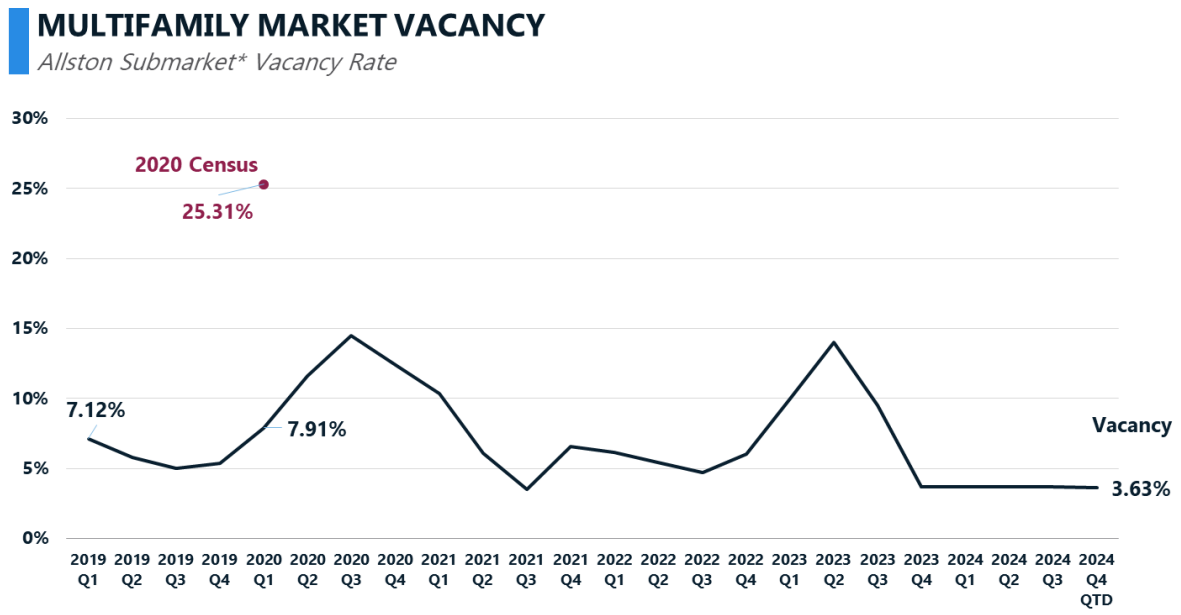
Total Housing Units in Allston: ACS and Census Combined with Yearly Completion



Source: U.S. Census Bureau 2010 and 2020 Decennial Census & Mayor's Office of Housing (completions), and 2009-2022 5-Year ACS, City of Boston Planning Department Research Division Analysis.

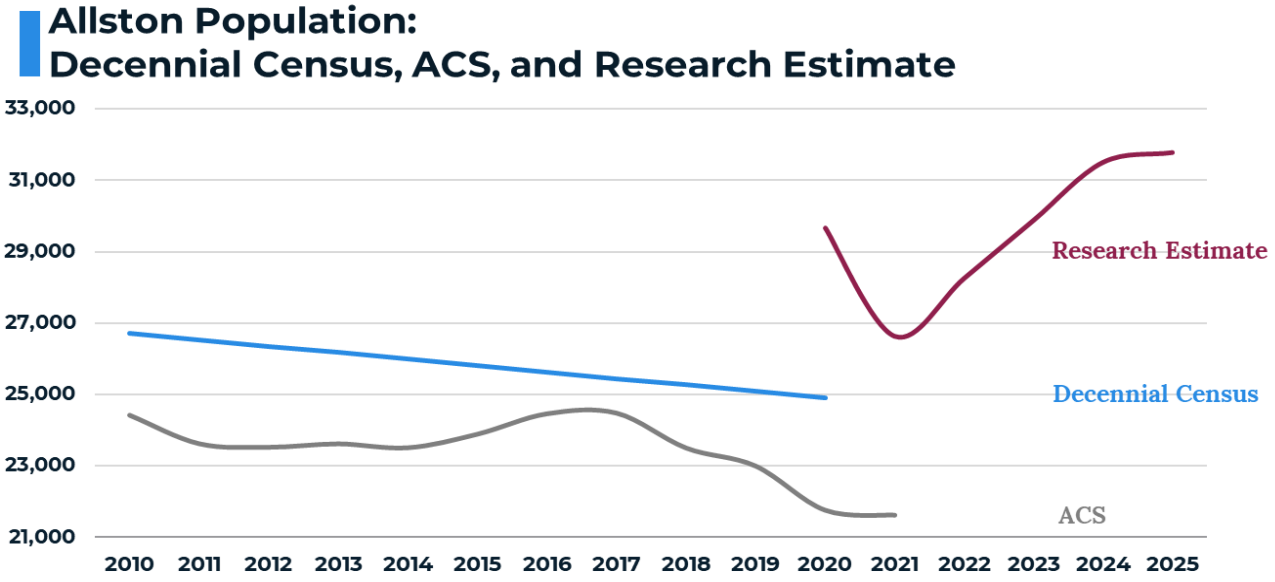
Real estate data on multi-family buildings show that vacancy rates in Allston were lower than the 2020 Census estimates for April 1, 2020. CoStar real estate data showed 7.9% vacancy rate for Q1 2020 in Allston tract 8.06, but the 2020 Census assigned a 25% vacancy rate for April 1, 2020. The

Census appeared to count housing units as vacant because there was no household response to the Census questionnaire, even though real estate data show these housing units were occupied in the weeks leading up to April 1, 2020. The majority of the household population in tract 8.06 are college or university students. Vacancy rates peaked during the 2020-2021 school year but then recovered. Allston tract 8.06 recovered to pre-pandemic vacancy levels by Q2 2021, and recent vacancy rates are below 4%, showing strong residential demand.



Source: CoStar, 5+ unit buildings only, and 2020 Decennial Census, Tract 8.06, City of Boston Planning Department Research Division.

Data submitted by colleges and universities to the City of Boston suggest that the number of students living in Allston, either on-campus or off-campus, had fully recovered pre-pandemic levels by the fall of 2022. Based on real estate and college enrollment data, the City of Boston Planning Department Research Division has created estimates of Allston's population in 2025. These population estimates show 14.5 percent growth in population 2020 to 2025, consistent with the 7.6 percent growth in housing units and 468 additional dorm beds over the same time period.



Source: 2020-2025 Research Division Estimates, U.S. Census Bureau 2010 and 2020 Decennial Census & 2010-2023 5-Year American Community Survey, City of Boston Planning Department Research Division Analysis.

CONCLUSION

Due to the pandemic as well as the inherent difficulties in counting and estimating a highly mobile young adult population, the Census has not been able to provide accurate population estimates for Boston. The 2020 Census and recent annual population estimates are significant undercounts for the city as a whole and particularly for neighborhoods with large student populations. These data limitations are obstacles to effective planning and policies for all of Boston's residents.

The Planning Department Research Division will continue engaging with the Census Bureau to address these issues. In the interim, the Research Division has created customized alternative population estimates for Boston by age and by neighborhood for use by City planners and policymakers. These population estimates will be updated annually.