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Boston Housing and Jobs Linkage Nexus Study

Final Report

to

Mayor's Office of Housing
City of Boston

Submitted by:

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Executive Summary

Boston established its Development Impact Project (DIP) Exaction policy in 1983 to collect exactions, also known as linkage fees, to mitigate the impact of large scale development projects on: (1) the need for and availability of affordable housing; and (2) job opportunities for low-income and moderate-income residents. Boston's current linkage fees are $13 per square foot (PSF) for affordable housing and $2.39 PSF for jobs, for a combined rate of $15.39 PSF. This report provides an updated nexus study to quantify the impact of future non-residential development on the demand for affordable housing and need for employment and training services in Boston and the linkage fee rates to mitigate these impacts. It also reviews the history of Boston's linkage policies, provides a macroeconomic profile of economic, demographic and housing conditions in the city, considers potential policy changes and recommends new linkage fee rates and policies.

Macroeconomic Profile. Boston had steady job growth from 2010 to 2019 followed by pandemic-induced decline for 2020 and 2021. Total payroll employment, increased by 121,501 jobs or 22%, from 2010 to 2019 before declining by 7.5% in 2020—a loss of 50.121 jobs. Health care and information technology were key drivers of growth over this period, accounting for eight of 15 high-growth industries and 65% of their new jobs from 2010 and the first half of 2021. Just under 30 million SF of new development of commercial or mixed-use buildings over 50,000 square feet occurred from 2011 to 2021. A large pipeline of potential future projects of 65.7 million SF indicates strong confidence in Boston's economy and future demand for non-residential real estate. Strong growth and real estate demand in the Life Science industry has resulted in a boom in the lab development pipeline, with many new lab projects being proposed and existing planned office projects being converted to lab space.

Boston's population grew by 9.4% from 2010 to 2020 to almost 675,000, a faster rate than the state (7.4%). The city's population is quite diverse with 28% foreign born and about 45% identifying their race/ethnicity as White Only, 22% as Black or African American Only, 20% Hispanic and 10% Asian Only. Significant racial disparities exist in household income and poverty rates: the median household income for White Households, at $108,291 is over twice that of Black, Latino and Asian households, at $47,800, $43,337 and $52,326, respectively. Poverty rates for Black, Latino and Asian households, at 21%, 27% and 28%, respectively, are well above the 10% rate for the White, Non-Latino households. With 42% of Boston households housing cost-burdened and 24% severely cost-burdened, there is a large need for affordable housing.

In 2020, Boston had a labor force of 413,366 residents and a labor force participation rate of 69.8%. The city's labor force is highly educated and concentrated in higher skilled occupations but with significant racial disparities. Almost half (49.9%) of Boston's labor force was employed in management, business, science, or art occupations in 2020. However, two-thirds of White workers and almost 59% of Asian workers held jobs in these higher paying occupations, compared to 31.4% for Black/African American workers, 30.4% for Hispanic or Latino workers. Similarly, over two-thirds (67.3%) of White residents 25 or older had a bachelor's degree or higher in 2020 compared to 19.8% and 25.7% for Black and Latino adults, respectively. Consequently, a gap exists between the type of jobs being created in many of Boston's high growth industries and the occupational profile of Boston's less educated labor force and particularly for Black, Latino and multi-racial workers.

Affordable Housing Demand. Based on projected new development of 14,861,000 square feet over the next ten years and the likely mix of tenant industries, 31,794 new jobs are estimated to be generated in Boston by this development. Information on the occupations and earnings of these new employees, in combination with data on the distribution of households by size and number of workers and survey results on the share of employees who moved to or sought housing in Boston when they obtained a job in the city was used to estimate the demand for 4,003 new affordable housing units from the projected new development and employment. This analysis projected the following need for new affordable units by household income level:

- 205 units for extremely low-income households at less than 30% of Area Median Income (AMI);
- 958 units for low-income households at 305 to 60% of AMI;
- 331 units for moderate-income households at 60% to 80% of AMI; and
- 2509 units for middle-income households at 80% to 120% of AMI.

Development Costs and Needed Subsidy. A separate analysis of the development costs and needed subsidy for rental and homeownership units was conducted based on 2,593 ownership units and 1,410 rental units[1]. Development costs were estimated based on the costs for recent comparable affordable housing projects built in Boston. For rental projects, the needed subsidy was calculated as the difference between total development costs and the amount of debt and equity that could be supported by the housing cash flow using affordable rents at 30% of household income and comparable operating costs. For ownership projects, the needed subsidy was calculated as the difference between total development costs and the affordable purchase price based on home mortgage payments, insurance and property taxes at 30% of household income and a 5% down payment. The results of this analysis are:

- Total development costs of $ 2.121 billion; and
- Total needed subsidy of $895.1 million with $127.3 million for the extremely low-income units, $412.5 million for the low-income units, $124.5 million for the moderate-income units and $230.9 million for the middle-income units.

The housing linkage fee needed to provide the full $895.1 million in subsidy is $80.20 per square foot on new non-residential development. However, low- and moderate-income housing development leverages public subsidies from federal and state sources in addition to those provided by local government Overall, the total City funds including NHT and other funds accounted for 14.7% of rental projects, and 58.9% of ownership projects. Applying this percentage to the required subsidy would result in a $21.88 housing linkage fee.

Training Needs and Financing Gap. New DIP development over the next ten years is expected to create almost 10,000 jobs in low- and middle-skill occupations that are the most accessible to low-income and moderate-income workers. Based on an analysis on occupational demand and training supply by the major industries in new development projects, the funding gap to train

[1] This mix is based on all of the extremely low-income and low-income units developed as rental units, 75% of moderate-income units built as rental and 25% as ownership, and 100% of the middle-income units built as ownership units.

Boston residents for 40% and 50% of these jobs was estimated, along with costs for related education and employment services, including English for Speakers of Other Languages (ESOL), Adult Basic Education (ABE), skill upgrading after employment to help workers advance into higher paying positions and stipends to offset lost income while attending training programs. High and low supply estimates for employment and training services was made to account for planned program expansions and the pandemic's impact on participation levels. The estimated total employment training funding gap with 40% resident employment ranged from $35.3 million to $45.4 million for the high and low-supply scenarios, with resulting warranted linkage fee rates of $3.16 to $4.07. At 50% resident employment, the estimated funding gap is $47.3 million to $60.4 million for the high-supply and low-supply scenarios, with resulting warranted linkage fee rates of $4.19 to $5.32.

Impact on Economic Competitiveness and Investment. An important consideration in adjusting Boston's linkage fees is the potential impact of a fee increase on attracting new tenants and the financial feasibility of new development. Boston's current combined linkage fee is below that of Cambridge ($33.34) and 10% above Somerville's rate of $13.98. The maximum combined rate of $85.52, on the other hand, is over two and one-half times Cambridge's fee and six time the rate in Somerville. Higher linkage fees will increase development costs, which can impact project economics in several ways, depending on several factors. Consequently, linkage fee increases were analyzed for their potential impact on tenant rents, developer returns and equity investor returns. If the maximum rate is fully passed on to tenants, it would increase rents by 6.5% to 8.8%, depending on property type and location, erasing Boston's rental advantage over East Cambridge by one-third and eliminating its advantage over Mid-Cambridge. Without any increase in rents, increased development costs would reduce developer returns by up to 32 basis points, potentially making some lab and office projects infeasible. The maximum fee has a larger impact on equity investor returns, reducing them by up to 2.64 percentage points, which would make it difficult for developers to secure the investment capital to undertake projects. Smaller fee increases in the range of $5 and $20 are unlikely to impact Boston's competitiveness in attracting tenants and generating new office and lab development, as they would have a small impact on rents, developer returns and equity investor returns.

Recommendations. Recommendations to simplify, update and improve Boston's linkage policies include: (1) changing the payment schedule to a single payment at certificate of occupancy; (2) eliminating the separate fee payment schedule for projects in the Downtown District; and (3) eliminating the 100,000 SF exemption.

Boston should set higher linkage fees for lab development projects, as their higher rents and returns allow them to make a larger contribution to mitigating impacts. The following proposed fees are based on doubling the total linkage fee rate to $30.78 for lab projects and a 50% increase to $23.09 for projects with other primary uses:

- **Increase the jobs linkage to $3.62** with elimination of the 100,000 SF exemption. If the exemption is not eliminated, the comparable fee level is $4.75
- **Increase the housing linkage fee to $26.78 for projects with a primary lab use** with elimination of the 100,000 SF exemption. If the exemption is not eliminated, the comparable fee level is $35.66.

- **Increase the housing linkage fee to $19.09 for projects with a primary** hotel, office, retail, institutional or other use subject to linkage payment with elimination of the 100,000 SF exemption. If the exemption is not eliminated, the comparable fee level is $25.41.

A final recommendation is that the City and its Office of Workforce Development continue its efforts to establish a consortium to strengthen the training system and improve access to job in the life science industry. This work is critical to creating a pipeline of low- and moderate-income Boston residents to gain jobs within this fast growing industry

Introduction

The City of Boston is experiencing a large increase in commercial development that is expanding the City's job base with the potential to increase local demand for housing including affordable housing for low-income, moderate-income and middle-income households. The City commissioned a study to assess the impact of this new development on affordable housing demand and the potential for a "linkage fee" to be paid by development projects to mitigate the cost to develop this housing. This report provides a nexus study to assist Watertown in deciding whether to establish a linkage fee and, if established, the appropriate fee level and policies. The report quantifies the impact of future non-residential development on the demand for affordable low, moderate, and middle-income housing in Watertown. It then analyzes the proportionate housing linkage fee rate to mitigate these impacts. Finally, it reviews linkage fees in other Massachusetts communities, several policy options and recommends linkage fee options and policies for implementation of a new housing linkage fee.

I. History and Overview of Boston's Linkage Program

Boston has a long standing policy, first approved in 1983, to collect Development Impact Exactions, also known as linkage fees, to address and mitigate the impact of large scale development projects on: (1) the need for and availability of affordable housing; and (2) job opportunities for low- and moderate income residents. To address these dual impacts, Boston levies two separate exactions: a Housing Exactions and a Jobs Exaction. The applicable types of development projects and uses are the same for both exactions but their fee level and payment options are different. This section summarizes Boston's current Development Impact Exaction policies, discusses how the policy and fee levels have changed over time and highlights key policy issues for the city to review and reconsider in conjunction with the Nexus Study.

Current Development Impact Exaction Policy

Boston's Development Impact Exaction Policy is defined under Article 80 of the city zoning code, which addresses development project review, in Section 80B-7. This policy requires housing and jobs exaction contributions for any real estate development that meets the definition of a "Development Impact Project" (DIP). Four characteristics establish a real estate project as a DIP subject to exactions:

1. The project cannot be built "as-of-right" and requires some forms of zoning relief;
2. The project involves either more than 100,000 square feet of new construction, addition to an existing building or renovation of an existing building;
3. Includes the proposed use of more than 100,000 square feet of gross floor area for uses defined as a Development Impact Use (explained below); and
4. Is not wholly owned by a government agency.

Since virtually all projects over 100,000 square feet require zoning relief, Development Impact Exactions apply to any new construction or renovated non-government owned real estate projects with over 100,000 square feet of "Development Impact Uses." The definition of Development Impact Use (DIU) is very broad and covers 40 distinct uses that fall within seven categories:

- Office;
- Retail Businesses;
- Public Services;
- Other Service Uses;
- Institutional;
- Educational; and
- Hotel/Motel.

The major building uses not subject to Development Exactions are wholesale businesses, storage, industrial uses, and parking.
A complete list of the 40 business/use types under Development Impact Use definition is included in Appendix A.

Housing Exactions are currently paid at a rate of $13.00 per gross square foot for the project square footage above 100,000 square feet. Thus, the first 100,000 square feet of any Development Impact Project is exempt from paying the Housing Exaction (and the Jobs Exaction as noted below). For Institutional Master Plans and Planned Development Areas, the exemptions applies to their overall amount of development in the plan rather than to each individual building projects. Exaction obligations can be met through either payment of a cash grant (Housing Contribution Grant) or by building low or moderate income housing units with cost at least equal to the required Housing Contribution Grant. In practice, virtually all Housing Exactions have been met through the grant option. Grants are paid in seven equal annual installments with the first payment due at the earlier of the Certificate of Occupancy date or 24 months after construction starts. All Housing Contribution Grant payments are allocated to the Neighborhood Housing Trust (NHT), a separate legal trust overseen by seven trustees that include the Boston Collector-Treasurer, five trustees appointed by the Mayor and the City Council President or her or his designee. The NHT awards the funds obtained from Housing Exaction grant receipts to help finance affordable housing developments, through a periodic RFP process.

Job Exactions are currently paid at a rate of $2.39 per project gross square foot above 100,000 square feet. Exaction obligations can be met through either payment of a cash grant (Job Contribution Grant) or creation of a job training program with a cost at least equal to the required Job Contribution Grant. In practice, almost all Job Exactions have been paid through the grant option. Grants are paid in two equal installments with the first payment due at building permit issuance and the second payment one year later. All Job Contribution Grant payments are allocated to the Neighborhood Jobs Trust (NJT), similar to the NHT as a separate legal trust overseen by three trustees-- the Boston Collector-Treasurer, the Director of the Office of Jobs and Community Services and a City Council member appointed by the Mayor. The NJT awards the funds obtained from Job Exaction Grants to finance job training, education and employment programs through a periodic RFP process.

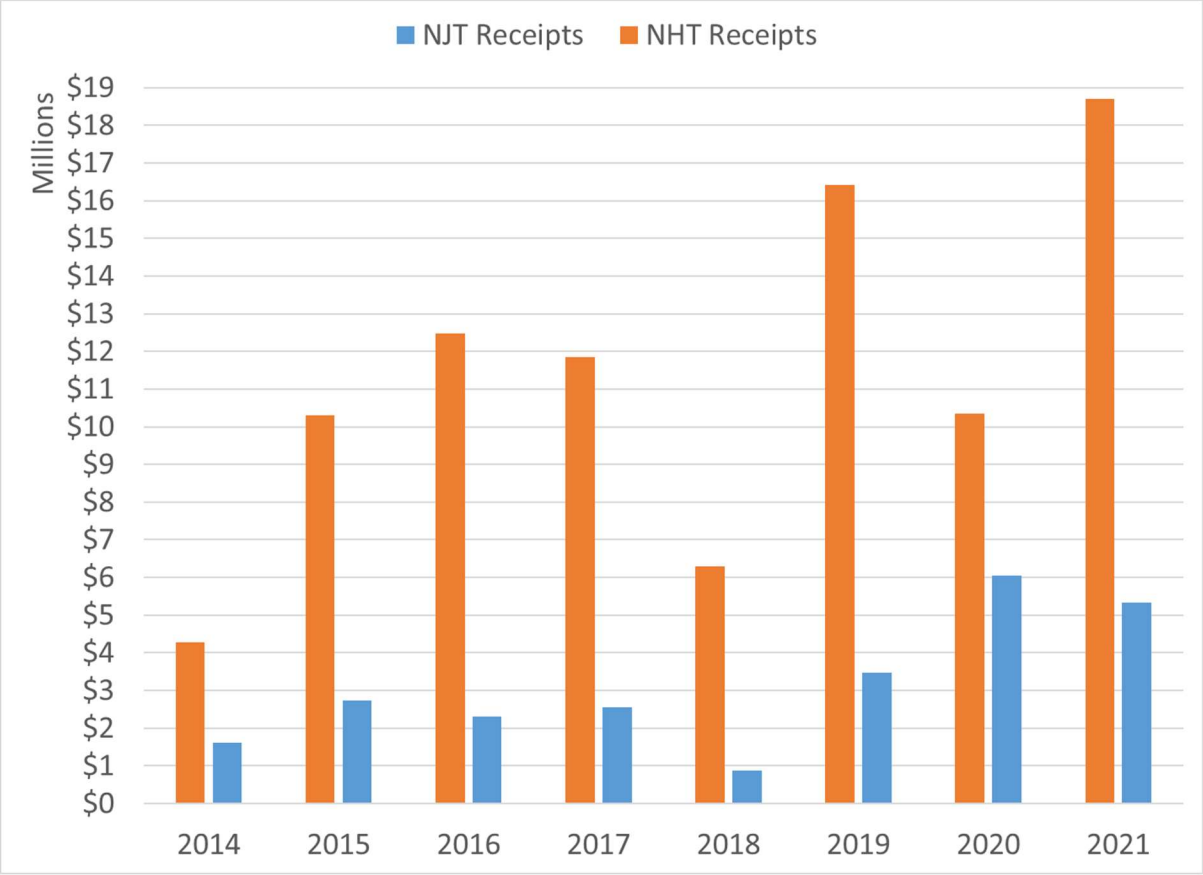
The recent home rule petition (Chapter 365 of the Acts of 2020) changed how the housing and job exaction rates can be adjusted. Previously, the housing and job exaction rates had been set by special state statutes and could be adjusted for inflation every three years by a vote of the BPDA Board of Directors. The new policy allows the Zoning Commission to set the exaction rates from time to time based on the recommendation of the BPDA. These changes to the exaction rates require a new nexus study that shall include an analysis of the following: (1) economic trends, such as real estate development activity, commercial rents per square foot, employment growth and inflation rates; (2) housing trends measured in terms of vacancy rates for affordable housing available to low- and moderate-income residents, and production statistics for new dwelling units; and (3) employment trends such as unemployment rates and statistics on the availability and use of job training programs. Additionally, exaction rates are adjusted automatically every July 1st based on an inflation index[2].

Combined exactions have generated combined over $14 million annually, on average, between FY 2014 and 2021. Detailed figures in **Figure 1-1** and **Table 1-1** on Neighborhood Jobs Trust receipts and Neighborhood Housing Trust receipts show how receipts have varied year-by-year and over

[2] This index is based on 50% of the change in consumer price *index* for all urban consumers or "CPI-U" and 50% of the change in the housing component of said CPI-U for the Boston metropolitan area.

time reflecting the cyclical nature of development projects and the growth of the exaction rate over time (See Figure 1-1). However, there is a clear trend toward higher payments over the period.

Figure 1-1. Annual Exaction Receipts, Neighborhood Jobs Trust and Neighborhood Housing Trust, FY 2014 to 2020



Source: City of Boston and ConsultEcon, Inc.

Table 1-1. Neighborhood Housing and Jobs Trusts Receipts by Fiscal Year 2014 through 2021

Fiscal Year	NJT Receipts	NHT Receipts
2021	$5,330,447	$18,708,913
2020	$6,041,567	$10,343,431
2019	$3,479,548	$16,409,443
2018	$883,465	$6,291,678
2017	$2,558,693	$11,839,721
2016	$2,296,442	$12,464,118
2015	$2,721,978	$10,294,821
2014	$1,621,030	$4,276,432
Total, 2014 to 2021	**$24,933,170**	**$90,628,558**
Average Annual	*$3,116,646*	*$11,328,570*

Source: City of Boston and ConsultEcon, Inc.

Evolution of Boston's Exaction Policy and Rates

Over the past thirty years, Boston's development impact exaction policies have changed through the addition of the jobs exaction, several increases in the exaction rate and other changes. **Table 1-2** provides a timeline of the major policy and rate changes for both the housing and jobs exactions. Boston established the initial housing exaction at $5 per square foot through city council action in 1983, following the recommendations of a mayoral Housing Linkage Advisory Group. In 1986, the jobs exaction was adopted by the City Council, following a report and recommendations by Jerome Kayden, Karl Case and Robert Pollard. The Neighborhood Housing Trust and Neighborhood Jobs Trust were established in 1986 and 1987, respectively, to oversee the allocation of exaction revenue to mitigate development impacts. Legal authority to levy the housing and jobs exactions was codified in state law during 1987 with passage of Chapter 371 of the Acts of 1987. This state law also provided a mechanism for increasing the exaction rates over time through application of the CPI formulas cited earlier. Two additional legal actions occurred in 1996, when the exaction policies were incorporated in Article 80 of Boston Zoning Code, and 2001 when the state legislature, through Chapter 170 of the Acts of 2001 authorized increases in the housing and jobs exaction levels to $7.18 and $1.44, respectively. This act also allowed the payment period for housing exactions by "neighborhood" projects outside the central business district from 12 years to seven years. These legislative changes implemented recommendations from an April 2001 report issued by the Linkage Commission appointed by Mayor Menino. After the 2001 authorized rate increase, the BPDA board made four further increases in the exaction rates by applying the CPI escalation formula, with the most recent change in 2020. These actions brought the housing and jobs exaction rates to the current levels of $13.00 and $2.39, respectively.

Table 1-2. Timeline for Boston's Linkage Program and Housing and Jobs Exactions

Year	Action
1983	Mayor White appoints Housing Linkage Advisory Group
1983	Advisory Group recommends $5 per square foot (psf) housing exaction
1983	Article 26 approved establishing housing exaction
1984	Housing exaction takes affect at $5 psf
1986	Kayden, Case and Pollard skills gap report
1986	Article 26A adds jobs exaction
1986	Jobs exaction takes affect at $1 psf
1986	Neighborhood Housing Trust established
1987	Neighborhood Jobs Trust established
1987	State law (Chapter 371 of the Acts of 1987) provides strong legal authority for exactions
1996	Exactions Incorporated into Article 80
2000	BRA increases fees to $5.49 and $1.09
2001	Menino Commission recommends increase in fees to $7.18 and $1.44
2001	Chapter 170 of the Acts of 2001 updates authority and level of linkage fees
2002	Exactions increased to $7.18 and $1.44
2006	Exactions increased to $7.87 and $1.57
2013	Exactions increased to $8.74 and $1.67
2020	Chapter 365 of the Acts of 2020 provides Boston's Zoning Commission the authority to periodically set new exaction rates
2021	Exactions increased to $13.00 and $2.39

Development Impact Exaction Policy Issues

As Boston looks to update its development impact exaction rates, it faces several common policy issues that cities have addressed in different ways. These core issues, beyond the critical question of the appropriate and warranted exaction rate are fourfold:

- **Applicable projects for exactions**. This policy defines the uses and scale of real estate development projects that are subject to exactions and what zoning status triggers exaction payments. Boston currently applies exactions to a very broad set of uses but has a fairly highly project size threshold at 100,000 square feet and only applies the requirement to projects seeking zoning relief. With the large growth in life science lab development, there may be a need to update applicable uses and their definition to ensure that lab space in its multiple forms are subject to exactions. The city may want to consider lowering the project threshold size and applying it "as-of-right" development. This study includes an analysis of new non-residential development over 50,000 square feet to explore that option.
- **Exaction variation by use**. Housing and job impacts vary by the type of use and business type since the density and wage levels vary considerably across uses and industries. Consequently, some cities and counties have exaction rates that vary by use. Offsetting the benefit of tailoring rates more closely to impacts are the added complexity of this

policy, disincentives it may create for certain uses and how to address a project's change in uses over time.

- **Exemptions.** Boston currently exempts the first 100,000 square feet of any project from exaction payments, which reduces the exactions paid by each project by $1.564 million under current rates. This exemption amount might be eliminated reducing the overall rate needed to provide the desired revenue needed to mitigate impact. On the other hand, reducing the exemption would increase the financial cost of exactions on smaller development projects.
- **Exaction payment schedule**. Boston allows housing exaction obligations to be paid over a seven year period, which slows the receipt of funds needed to build affordable housing. This extended payment schedule might be shortened to pay exactions more quickly and accelerate the supply of needed housing subsidy funds.
- **Present value payment.** Developers have the option to pay exactions in one lump sum, based on a calculation of the present value of the seven year stream of exaction payments. This option is not widely used and there may be value in providing incentives for its greater use, to accelerate the available funds for both trusts. Another policy and administrative issue is how to set the appropriate discount rate used for these calculations.
- **Exaction rate adjustment over time.** The recent home rule petition now allows Boston's Zoning Commission to make changes based on the completion of a nexus study. The City might want to establish a specific time interval for conduction regular nexus studies and updating the exaction rates based on a review of the factors specified in the new legislations.

In addition to these policy issues, there may be administrative changes that can improve or streamline how the exactions are calculated, monitored and collected.

II. Boston Macroeconomic Analysis: Economy, Demographics & Housing

Introduction

This report provides a high-level review and analysis of Boston's economy, population and housing market to provide context for the Affordable Housing and Jobs Linkage analysis. It is organized in seven sections. First, an overview of Boston's jobs base and growth trends is provided, focusing on "payroll" employment among firms with employees, as these are the occupants and drivers of Boston's large development projects addressed in the Development Impact exaction policy. Non-residential development activity, the current project pipeline and their relationship to economic trends are addressed in the second section. The third and fourth sections focus on Boston residents with a summary of demographic and household characteristics in Section Four and a labor force profile in Section Five. Key housing market conditions and trends are presented in Section Six. In the last two sections, national trends that may impact Boston's economy, development activity and its relationship to addressing affordable housing and inclusive employment are discussed followed by overall conclusions on how these macroeconomic conditions are likely to influence future non-residential development and its impact on affordable housing and employment opportunities.

1.0 Boston's Economy and Employment Base

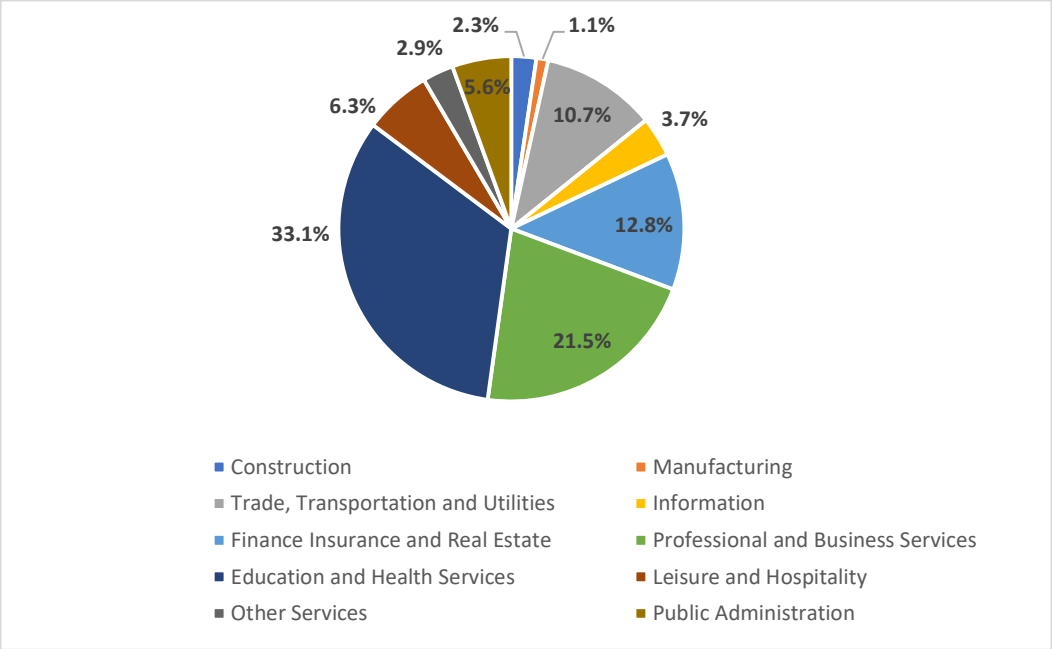
Boston's economy has a large and diverse base of jobs located within the city but has experienced significant losses since the Covid-19 pandemic. Based on estimates by the Boston Planning and Development Agency, combined payroll and non-payroll employment[3] totaled 851,468 in 2019 and declined by 6.9% to 792,420 in 2020. Payroll employment totaled 670,886 and 620,765, respectively, accounted for slightly more than 78% of total employment for 2019 and 2020 but declined at a slightly higher pace (7.5%) than total employment. During the first half of 2021, total payroll employment showed little change, averaging 620,593. However, based on more timely data, the BPDA shows 2.9% growth during 2021 to 639,188.

The balance of this section focuses on payroll employment since this is the basis for the occupancy and employment opportunities that occur in large development projects covered by Boston's Development Impact Exaction Policy (also known as "linkage"). This analysis is based on data provided from the Quarterly Census of Employment and Wages provided by the Massachusetts Department of Labor for the period 2010 to the first six months of 2021. As shown in **Figure 2-1,** Boston's payroll employment is concentrated in two sectors that accounted for almost 55% of total employment for the first half of 2021: Education and Health Care, and Professional and Business Services. The balance of employment is spread across seven other sectors with Finance, Insurance and Real Estate and Trade, Transportation and Utilities the next largest sectors with 12.8% and 10.7% of total payroll employment, respectively. However, annual wages paid (i.e., payroll) is even more concentrated than jobs with three sectors—Education and Health Care, Professional and Business Services and Finance, Insurance and Real Estate—together accounting for three-quarters of the city's entire wages paid in 2020. Professional and Business Services and Finance,

[3] Payroll employment represents jobs at employers that are covered by the unemployment insurance system. Non-payroll jobs represent self-employed workers, sole entrepreneurs without employees, contract and gig workers that occur outside of formal employment relationships.

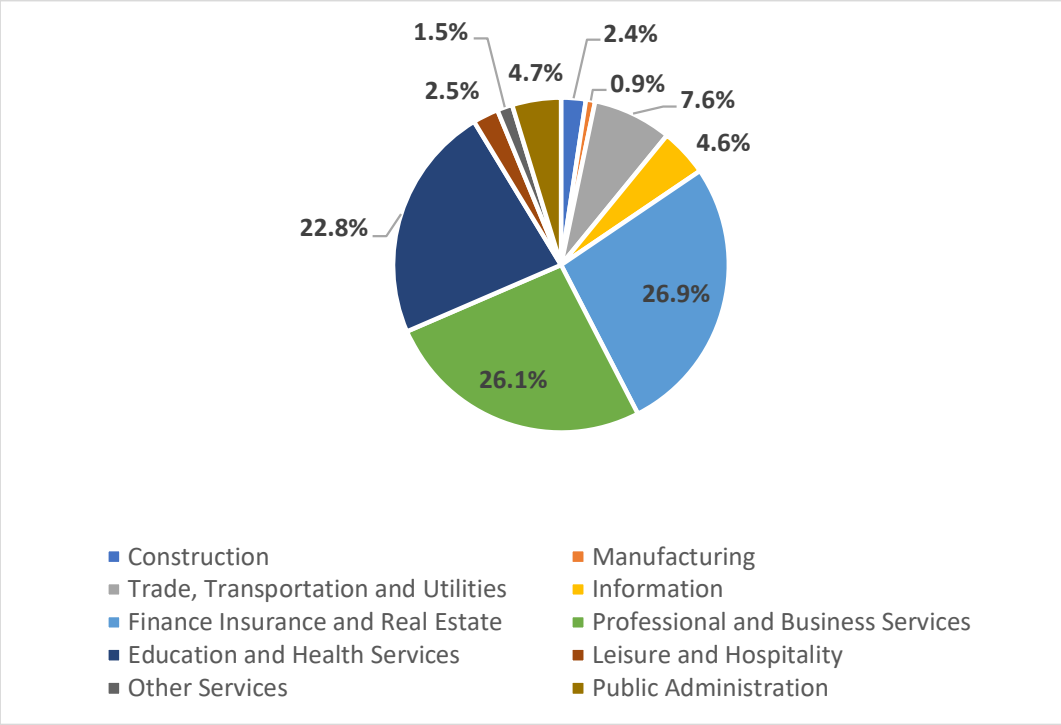
Insurance and Real Estate have a payroll share that is greater than their employment share- indicating that jobs in these sectors pay higher wages, on average, than other sectors in Boston.

Figure 2-1. Boston Payroll Employment by Sector, 2021 First Half



Source: Massachusetts Department of Labor and Workforce Development
Quarterly Census of Employment and Wages (QCEW)

Figure 2-2 Boston Annual Wages (Payroll) by Sector, 2020

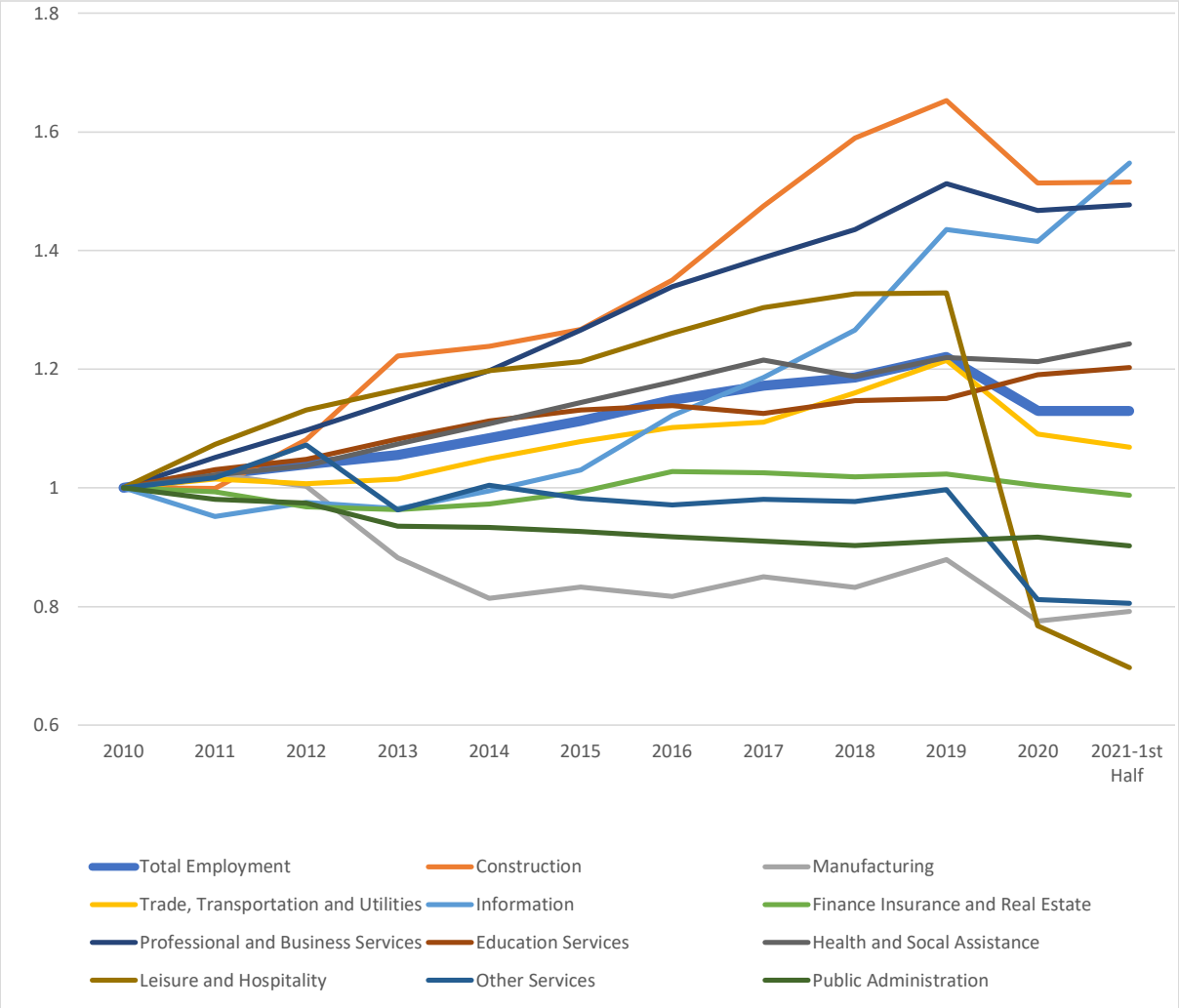


Source: Massachusetts Department of Labor and Workforce Development QCEW

Employment trends for Boston show steady overall job growth from 2010 to 2019 followed by pandemic-induced decline for 2020 and 2021. However, job growth varied considerably across sectors. To compare employment growth across sectors of varied size, an index was used that compares a sector's employment for a given year to its employment level in 2010. The index value for any year represents that sector's percentage growth in employment since 2010. **Figure 2-3** shows the index values for Boston's total payroll employment and its major sectors. Total payroll employment, represented by the large blue bar in the middle of the chart, increased by 121,501 jobs or 22%, from 2010 to 2019 before declining by 7.5% in 2020—a loss of 50.121 jobs. Five sectors had growth rates higher than overall employment through the first half of 2021:

- Construction – 52% adding 4,928 jobs
- Information – 55% adding 8,207 jobs
- Professional and Business Services- 48% , adding 43,048 jobs
- Education; 20%, adding 9,649 jobs
- Health Care and Social Assistance, adding 28,927 jobs.

Figure 2-3. Index of Boston Payroll Employment Growth by Sector, 2010 to 2021, First Half



Source: Massachusetts Department of Labor and Workforce Development Employment QCEW

Employment in the Finance, Insurance and Real Estate sector was stable over this period while Manufacturing and Other Services employment was steadily declining—dropping by 21% and 19%, respectively, from 2010 to the first half of 2021. Leisure and Hospitality, which grew steadily through 2019, was severely impacted by the pandemic and experienced steep job losses in 2020 and 2021.

Large and High Growth Industries. Boston has a diverse mix of industries within the sectors that comprise its employment base. In terms of impact on future development, it is important to understand the City's largest industries and those adding the most jobs, as these will likely drive demand for new real estate, tenants that occupy new development and the resulting composition of jobs. The industry- based mix of these new jobs informs employment opportunities for Boston's labor force and the earnings and need for affordable housing among residents employed in these developments.

Boston's largest industries[4], based on a threshold of 12,400 jobs or 2% of total employment, are listed in **Table 2-1**. Thirteen industries with 306,899 jobs meet this threshold and together represent 49.4% of Boston's total employment during the first half (six months) of 2021. Representing Boston's Education and Health Care Sector, the two largest industries, by far, are General Medical & Surgical Hospitals and Colleges and Universities—accounting for 117,496 jobs. Other major industries cut across Boston's diverse sectors, including Finance and Real Estate, Professional and Business Services, Health Care and Social Assistance, Education and Leisure and Hospitality. Two technology-based industries are included: Computer Systems Design; and Scientific Research & Development (largely life science firms).

Table 2-1. Boston's Largest Industries, 2021, 1st Half

Industry	2021 First Half Employment	Percent of Total 2021 First Half Employment	Employment Growth 2010 to 2021 First Half
General Medical & Surgical Hospitals	79,555	12.8%	9,693
Colleges and Universities	37,941	6.1%	6,193
Other Financial Investment Activities	23,580	3.8%	3,818
Restaurants & Other Eating Places	23,572	3.8%	-6,094
Computer Systems Design & Rel Services	22,164	3.6%	16,512
Management & Technical Consulting Svc	17,760	2.9%	6,458
Other Hospitals	17,610	2.8%	4,413
Individual and Family Services	16,020	2.6%	9,288
Legal Services	14,583	2.3%	-287
Insurance Carriers	14,530	2.3%	-403
Scientific Research and Development Svc	13,742	2.2%	6,103
Elementary Education	13,066	2.1%	NA
Employment Services	12,775	2.1%	3,320

Source: Massachusetts Department of Labor and Workforce Development Employment QCEW

Employment growth over the past decade varies across these major industries. While most added several thousand jobs since 2010, three industries reduced employment. Most notably, Restaurants and Oher Eating Places lost 6,094—reflecting the impact of the Covid-19 pandemic. Prior to the pandemic, restaurants were a fast-growing industry that added over 12,000 jobs between 2010 and 2019. Legal Services and Insurance Carriers are large industries with stable employment—each shed a few hundred jobs between 2010 and 2021 but maintained employment between 14,000 and 15,000 throughout the period. Since the employment services industries supplies employees to other businesses, this is not a single industry but represents jobs across a range of Boston industries. Its size and growth indicates the increasing use of temporary and contracted workers among employers.

Table 2-2 lists the 15 industries that added the highest number of jobs between 2010 and the first half of 2021, using a threshold of 2,000. As recent drivers of employment growth, these industries are key generators of demand and tenancy for new development projects. These 15 industries combined to add 94,365 jobs –exceeding Boston's overall net job growth of 71,208. Health care and information technology were key drivers of growth over this period, accounting for eight of

[4] Industries were defined as those at the four-digit NAICS code level.

the 15 high growth industries and 65% of their new jobs. The four IT industries (Computer Systems Design, Electronic Shopping, Software, and Data Processing) had very high growth rates over this period, combined to add 34,258 jobs and represented three of five industries with the highest absolute job growth. Three professional service industries (Management & Technical Consulting, Architecture & Engineering, and Accounting & Bookkeeping) were also important sources of growth, together adding 13,308 jobs. Scientific Research and Development Services—the largest component of Life Science industries—grew by 80% and added 6,103 jobs from 2010 to 2021. This figure understates the overall size and growth among Life Science industries. The BPDA Research Division identified five components with the city's Life Science industry cluster: 1) Pharmaceutical & Medical Manufacturing; 2) Colleges & Universities; 3) Hospitals; 4) Scientific Research & Development; and 5) Medical & Diagnostic Laboratories[5]. Total estimated Life Science Industry employment for all five of these components was 17,381 in the second quarter of 2021- an increase of 5,704 jobs, or 49% , since 2010 (See **Figure 2-3A**).

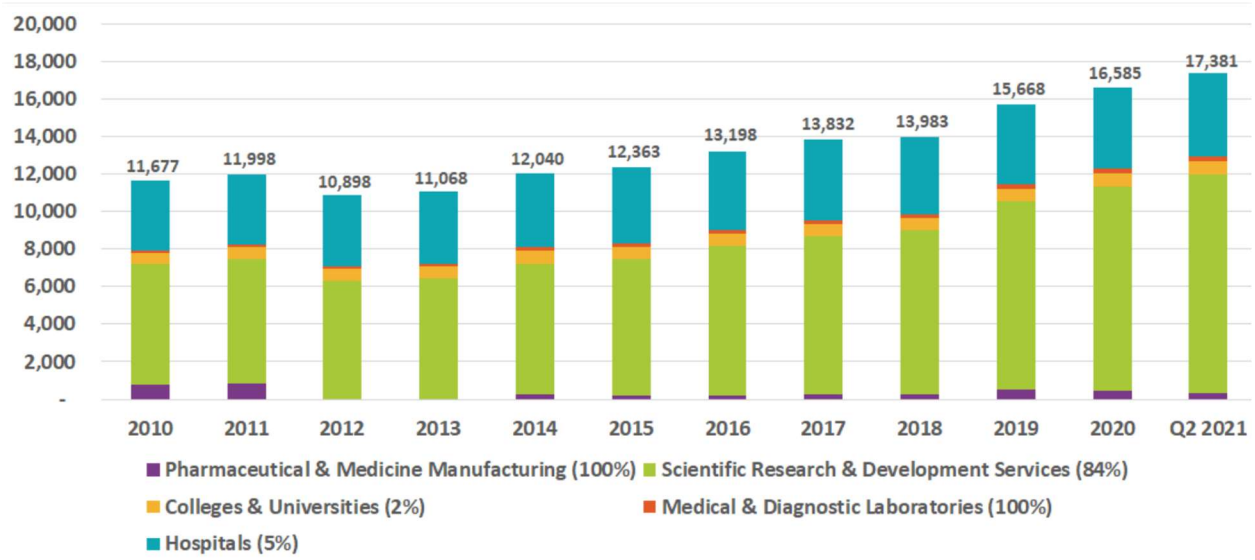
Table 2-2. Boston Industries with Largest Employment Growth 2010 to 2021, 1st Half*

Industry	Employment Growth 2010 to 2021 First Half	Percent Employment Growth 2010 to 2021 First Half
Computer Systems Design & Related Services	16,512	292.1%
General Medical & Surgical Hospitals	9,693	13.9%
Individual and Family Services	9,288	138.0%
Electronic Shopping & Mail-Order Houses	7,913	620.1%
Software Publishers	7,385	766.1%
Management & Technical Consulting Services	6,458	57.1%
Colleges & Universities	6,193	19.5%
Scientific Research & Development Services*	6,103	79.9%
Other Hospitals	4,413	33.4%
Architectural and Engineering Services	3,944	71-0%
Other Financial Investment Activities	3,818	19.3%
Offices of Physicians	3,471	44.0%
Accounting and Bookkeeping Services	3,406	50.7%
Employment Services	3,320	35.1%
Data Processing & Related Services	2,448	444.3%

*Includes life science/biotechnology firms.
Source: Massachusetts Department of Labor and Workforce Development Employment QCEW

[5] BPDA Research Division , *Boston's Economy 2022*, April 2022.

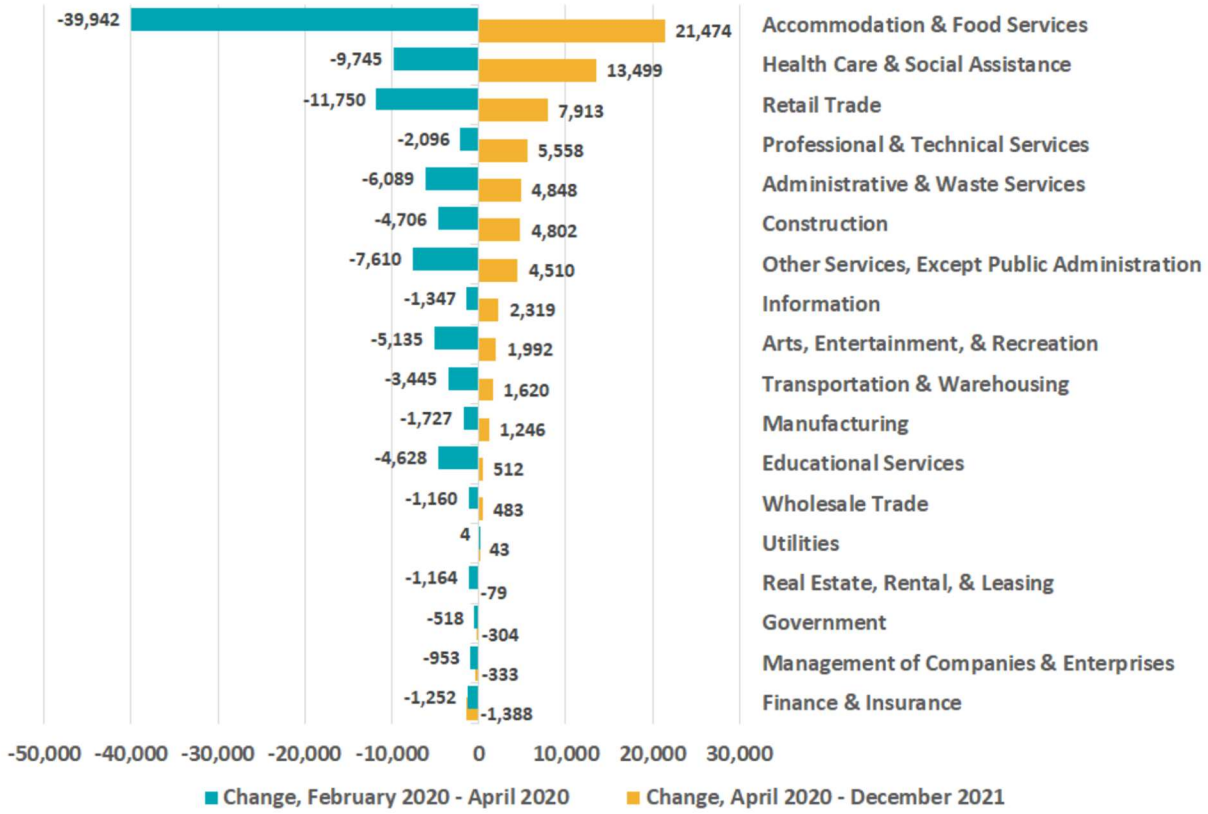
Figure 2-3A. Estimated Employment, Boston Life Science Industry Cluster, 2010 to 2021



Source: BPDA Research Division, *Boston's Economy 2022*, April 2022

Covid-19 Impacts. As noted earlier, the Covid-19 pandemic led to a large decline in Boston's payroll employment from 2019 to 2020. While the City's economy is rebounding, it has not regained all of the lost employment and recovery has varied considerably across sectors (see Figure 2-4). Recovery job growth in a few sectors, such as Health Care and Professional & Business Services, has exceeded the initial job loss, but for most sectors, the original job loss has not been regained. Accommodations & Food Services, Arts, Entertainment & Recreation. Transportation & Warehousing, and Education Services all have regained only a fraction of the jobs lost from the pandemic.

Figure 2-4. Change in Boston Payroll Employment, Crisis and Recovery



Source*:* BPDA Research Division, Boston's Economy 2022, April 2022

2.0 Non-Residential Real Estate Development

Boston's sustained pre-pandemic economic growth generated a strong real estate development market with substantial new non-residential construction from 2011 through early 2022. A large pipeline of projects also exists that includes those in construction, approved projects awaiting the construction stage and projects under review. **Table 2-3** summarizes the total square feet (SF) of development projects with 50,000 SF or more completed from 2011 to 2021 along with those under construction and in pre-construction stages.

Table 2-3. Boston Commercial and Mixed-Use Development Projects 50,000 SF or More by Project Status, April 2022

Project Status	Housing Units	Total SF	New/ Redeveloped Non-Res SF	Percent Non-Res to Total SF
Complete, 2011 through 2021	2,271	29,860,775	25,821,485	86%
Average Annual, 2011 through 2021	*206*	*2,714,616*	*2,347,408*	
Future Development				
In Construction	1,126	9,795,689	8,251,744	84%
Approved	7,585	30,618,748	22,456,587	73%
Under Review	3,338	25,272,575	21,388,844	85%
Total Future Development Potential	**12,049**	**65,687,012**	**52,097,175**	**79%**

Source: City of Boston and ConsultEcon, Inc.

Just under 30 million SF of new development of larger commercial or mixed-use buildings occurred during this period, with 86%, or 25.8 million as non-residential development. The pipeline of potential future projects is even larger at 65.7 million SF with 52.1 million SF (79%) in non-residential square footage—indicating strong confidence in Boston's economy and future demand for non-residential real estate. Moreover, over 8 million SF of non-residential development was under construction as of April 2022—3.5 times the annual average size of completed projects over the prior eleven years.

Based on BPDA's current pipeline, future commercial and mixed-use development will have a different mix of uses than the projects completed from 2011 to 2021 (see **Table 2-4**). While office projects account for the largest share of future development, their share drops to 32%, compared with 45% for completed projects. Far larger amounts of residential mixed-use development and Lab/R&D projects are in the pipeline than were completed during the last decade, at over 15.5 million SF and 10.7 million SF, respectively. The large growth in planned lab development reflects the region's fast-growing Life Sciences industry cluster and is occurring throughout the greater Boston areas.

Table 2-4. Completed and Potential Future Non-Residential Boston Development Projects by Use

Summary Land Use	Completed Projects, 2011 to 2021	Percent of Total		Future Projects 1/	Percent to Total
Commercial	2,534,504	10%		1,819,499	4%
Office	11,017,054	45%		16,134,346	32%
Hotel	3,475,042	14%		1,928,563	4%
Educational	2,646,439	11%		1,944,604	4%
Medical	2,105,180	9%		2,533,250	5%
Res Mixed Use	1,421,657	6%		15,484,525	31%
Parking Mixed use	705,456	3%		101,300	0%
Lab / R&D	720,353	3%		10,720,292	21%
Total Qualifying for Land Use	**24,625,685**	**100%**		**50,666,379**	**100%**

1/ In construction, approved, and under review as of April 2022. Includes Residential Mixed-Use, but not Residential Use Only. Source: City of Boston and ConsultEcon, Inc.

Boston's office real estate market slowed during the pandemic with increases in vacancy and available space. Based on Costar data cited in the BPDA's Research Division's report, Boston's Economy 2022, Boston had close to 115 million SF of office space in 2021 with 48 million SF in Downtown, 17 million in Back Bay, and 15 million in the South Boston Waterfront. Boston's office vacancy rate rose from around 6% in 2019 to 11% by the end of 2021 with office vacancy rates above the citywide average in the South Boston Waterfront, Downtown, Charlestown, and East Boston. Office vacancy rates continued to rise throughout 2021 in Boston's financial district, while beginning to fall from a high level in the Seaport and stabilizing in Back Bay. CoStar forecasts Boston office vacancies to stabilize at around 10%, which is the historical average for the past 15 years. Despite the increase in vacancies, Boston had positive net absorption of over 431, 000 SF in office space during 2021 with Class A space performing well with net absorption of 1.2 million SF[6].

Office space utilization, however, remained low in 2021, below 20% for major downtown building throughout the year.[7] Low worker occupancy of office buildings due to the pandemic reduces sales at stores and restaurants in the city's major business district with negative effects on the retail real estate market. The city's retail vacancy rate increased to 2.4% in 2021, compared to 2.2% in 2020 while retail rents fell from $48.27/sf in 2019 to $46.19/sf in 2020 to $46.00/sf in 2021[8].

Fueled by Boston's growing Life Science industry, the Lab real estate market has been booming in Boston and throughout the region. While Life Science firms were historically centered in

[6] Colliers, *2021 Q4 Boston Office Market Report.*
[7] Cited in BPDA Research Division, *Boston's Economy 2022* from CBRE, https://www.cbre.us/research-and-reports/Boston-Office-Figures-Q3-2021.
[8] BPDA Research Division, *Boston's Economy 2022.*

Cambridge, especially around MIT and Kendall Square, Boston has attracted a growing number of Life Science companies as firms look for lower cost alternatives to Kendall Square and rapid industry growth has outpaced the supply of space. Rapid industry growth has resulted in a large shortage of lab space with vacancy rates close to zero in Boston and Cambridge and at 2% in the suburban market[9]. According to real estate firm CBRE, Boston had positive absorption of 1.3 million SF of life science space in 2021 with rents reaching $103.24 per SF, triple net[10].

Strong growth and real estate demand in the Life Science industry has resulted in a boom in the lab development pipeline with many new lab projects being proposed and existing planned office projects being converted to lab space. Within Boston, new lab/life science projects are being proposed in new parts of the City beyond the Seaport District, including the Fenway, Allston-Brighton, Dorchester and Roxbury. Substantial new lab development is also in the pipeline for Cambridge and the Boston suburbs. According to a recent report by real estate brokerage firm Newmark[11], there is a potential pipeline of over 49 million SF of new lab development in the Boston region, with 14.5 million SF under construction and another 34.6 million in proposed projects. This pipeline is approaching twice the size of the region's 26.8 million SF of existing lab space and if largely developed, poses the risk that the market will become overbuilt and experience increased vacancy and declining rents later this decade.

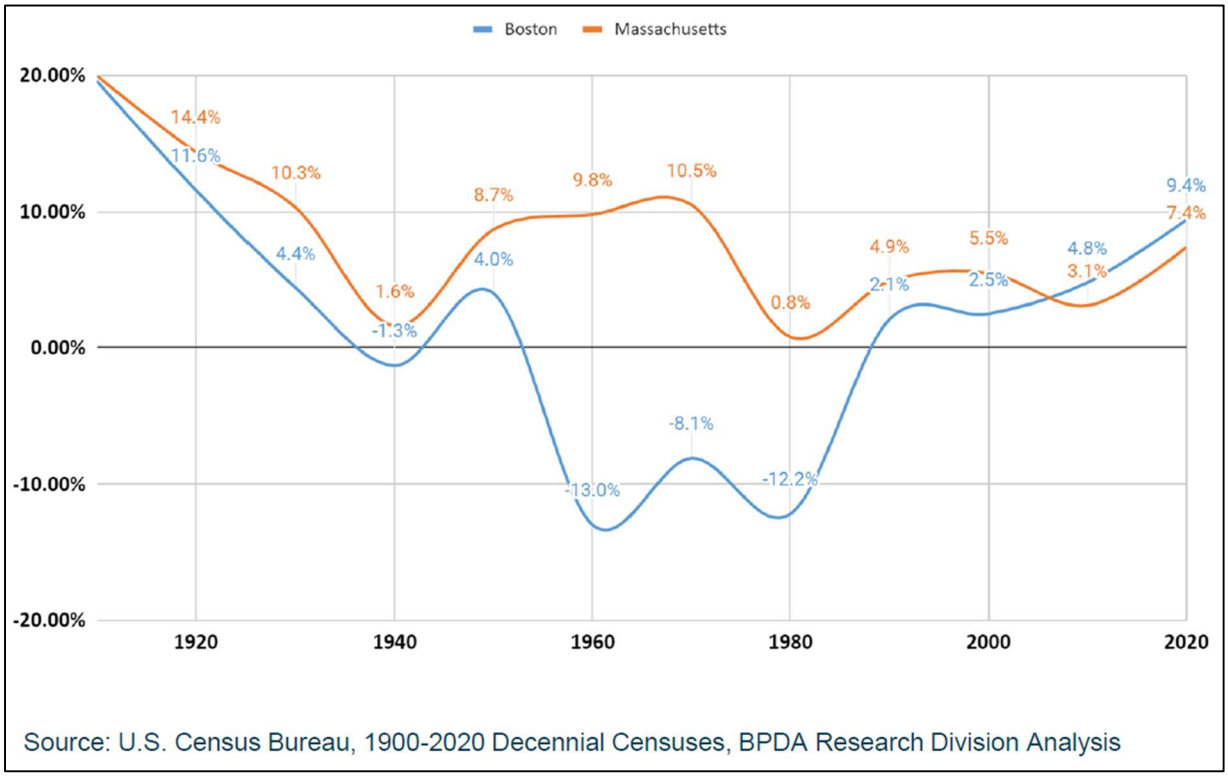
[9] Colliers, *2021 Q4 Boston Lab Report.*
[10] BPDA Research Division, *Boston's Economy 2022.*
[11] Newmark, *2021 Year End Life Science Overview and Market Clusters.*

3.0 DEMOGRAPHIC PROFILE AND TRENDS

Population and Household Size

According to the Census 2020, the population of Boston was about 675,000 and there were 279,000 households. The average household size was 2.35 persons based on the American Community Survey 2020 (5-year) estimates. **Figure 2-5.** shows the population growth in Boston and Massachusetts from 1910 to 2020. Boston grew by 9.4% from 2010 to 2020, faster than the state total (7.4percent) and national total (7.4percent).

Figure 2-5. Population Growth for Boston and Massachusetts by Decade (1910 to 2020)



Source: U.S. Census Bureau, 1900-2020 Decennial Censuses, BPDA Research Division Analysis

Age Characteristics

The age distribution for Boston is shown in **Figure 2-6**. The largest age group in the population was from age 20 to 34, representing 35% of the total population. Boston had 102,000 children under the age of 18 in 2020, making up 15 percent of the total population.

Figure 2-6. Age Distribution for Population of Boston, 2016 to 2020 5-Year ACS Estimates

Age Distribution - 5YR ACS 2016-2020		
Total Population	689,326	
< 5	34,039	4.9%
5 - 14	57,230	8.3%
15 - 17	17,323	2.5%
18- 19	31,301	4.5%
20 - 34	238,796	34.6%
35 - 44	86,463	12.5%
45 - 54	73,036	10.6%
55 - 64	69,854	10.1%
> 65	81,284	11.8%

Source: Boston Public Schools, Boston Public Schools at a Glance 2021-2022, BPDA Research Division Analysis.

Foreign-Born Population

Data in **Figure 2-7** shows the number of Boston residents born in the U.S. and born in foreign countries, as well as citizenship in 2020. Boston had approximately 194,000 foreign-born residents in 2020, representing about 28% of Boston's population, and about 14% of the population was not a U.S. citizen.

Figure 2-7. Nativity for Population of Boston, 2016 – 2020 5-Year ACS Estimates

Nativity - 5YR ACS 2016-2020		
Total Population	689,326	
Native	494,788	71.8%
Foreign Born	194,538	
U.S. Citizen by Naturalization	97,303	14.1%
Not a U.S. Citizen	97,235	14.1%

Source: Boston Public Schools, Boston Public Schools at a Glance 2021-2022, BPDA Research Division Analysis.

Racial and Ethnic Composition

Of the total population in Boston in 2020, about 45% identified their race / ethnicity as White Only. The next two largest racial / ethnic groups were Black or African American Only (22%) and Hispanic Only (20%). The breakdown of race / ethnicity for Boston is shown in **Figure 2-8**. Boston has become more diverse in recent history and Boston's child population is more diverse than its adult population.

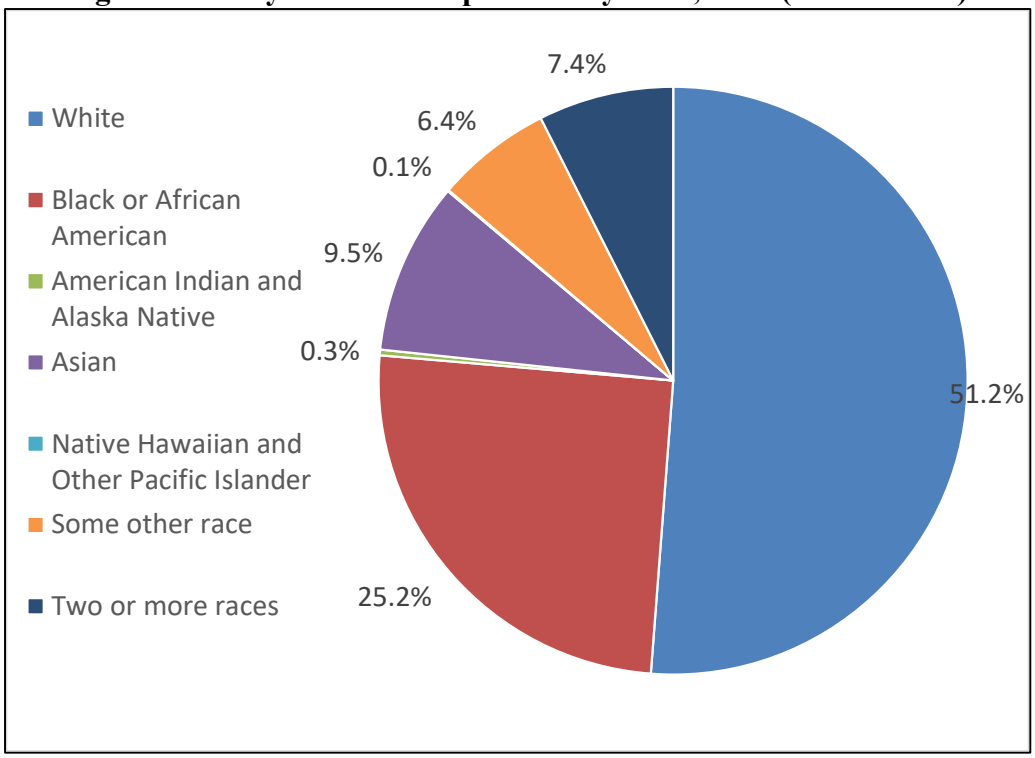
Figure 2-8. Race and Ethnicity for Population of Boston, 2016 – 2020 5-Year ACS Estimates

Race & Ethnicity - 5YR ACS 2016-2020		
Total Population	689,326	
White Only	308,346	44.7%
Black or African American only	151,564	22.0%
American Indian and Alaska Native Only	1,388	0.2%
Asian Only	67,041	9.7%
Native Hawaiian and Pacific Islander Only	331	0.0%
Hispanic Only *	134,703	19.5%
Other Race	4,918	0.7%
Two or More Races	21,035	3.1%

Note: Hispanics can be of any race but are reported separately in this analysis.
Source: Boston Public Schools, Boston Public Schools at a Glance 2021-2022, BPDA Research Division Analysis.

Data in **Figure 2-9** show the 2020 population by race (not including Hispanic ethnicity) in Boston. Just over half of the population is White, and people of Black or African American descent make up just over a quarter of the population. About 17% of total population was of Hispanic or Latino origins, and about 51% of the population was White alone.

Figure 2-9. City of Boston Population by Race, 2020 (ACS 5-Year)



Source: U.S. Census Bureau, 2016 – 2020 5-Year American Community Survey; and ConsultEcon Inc.

Poverty Rates

About 59,000 people, representing 9.1% of the population of Boston for whom poverty status is determined, were at less than 50% of the poverty level. Child poverty during the same period was 12.3%, according to 5-Year ACS Estimates (2016 – 2020). Data in **Figure 2-10** show families in poverty by family type for 2020.

Figure 2-10. City of Boston Families in Poverty by Family Type, 2020

Family Type	Less than 50 percent of the poverty level	Percent of Families in Poverty	Total Population [1/]	Poverty Rate
In family households				
In married-couple family	6,205	10.6%	248,196	2.5%
In Female householder, no spouse present households	18,552	31.6%	137,420	13.5%
In family households	27,038	46.1%	422,461	6.4%
In other living arrangements	31,579	53.9%	223,968	14.1%
Total Population	**58,617**	**100.0%**	**646,429**	**9.1%**

1/ Total population for whom poverty status is determined.

Source: U.S. Census Bureau, 2016 – 2020 5-Year American Community Survey; and ConsultEcon Inc.

Data in **Figure 2-11** show the population of Boston at or below the poverty line in 2020 by race. While the White population had a relatively lower percentage of the population at or below the poverty line compared to their percentage of the total population (36% versus 51%), the other racial groups had a relatively higher percentage of population at or below the poverty line.

Figure 2-11. City of Boston Population and Poverty Rates, 2020

	Less than 50 percent of the poverty level	Poverty Rate (< 50%)	Less than 100 percent of the poverty level	Poverty Rate (< 100%)	Less than 125 percent of the poverty level	Poverty Rate (< 125%)	Total
Total Population [1/]	58,825	9%	116,357	18%	140,922	22%	646,429
By Race and Hispanic or Latino Origin							
One race	52,669	9%	105,937	18%	128,082	21%	598,515
White	22,505	7%	41,369	13%	49,974	15%	330,952
Black or African American	14,645	9%	34,496	21%	41,819	26%	162,719
American Indian and Alaska Native	162	8%	514	25%	556	27%	2,030
Asian	9,555	16%	17,088	28%	20,640	34%	61,247
Native Hawaiian and Other Pacific Islander	17	5%	17	5%	17	5%	346
Some other race	5,647	14%	12,243	30%	15,211	37%	41,221
Two or more races	5,989	13%	10,302	22%	12,458	26%	47,914
Hispanic or Latino origin (of any race)	16,740	13%	35,297	27%	43,992	34%	129,770
White alone, not Hispanic or Latino	16,663	6%	29,090	10%	34,738	12%	282,424

1/ Total population for whom poverty status is determined.

Source: U.S. Census Bureau, 2016 – 2020 5-Year American Community Survey; and ConsultEcon Inc.

Source: U.S. Census Bureau, 2016 – 2020 5-Year American Community Survey; and ConsultEcon Inc.

Household Types and Sizes

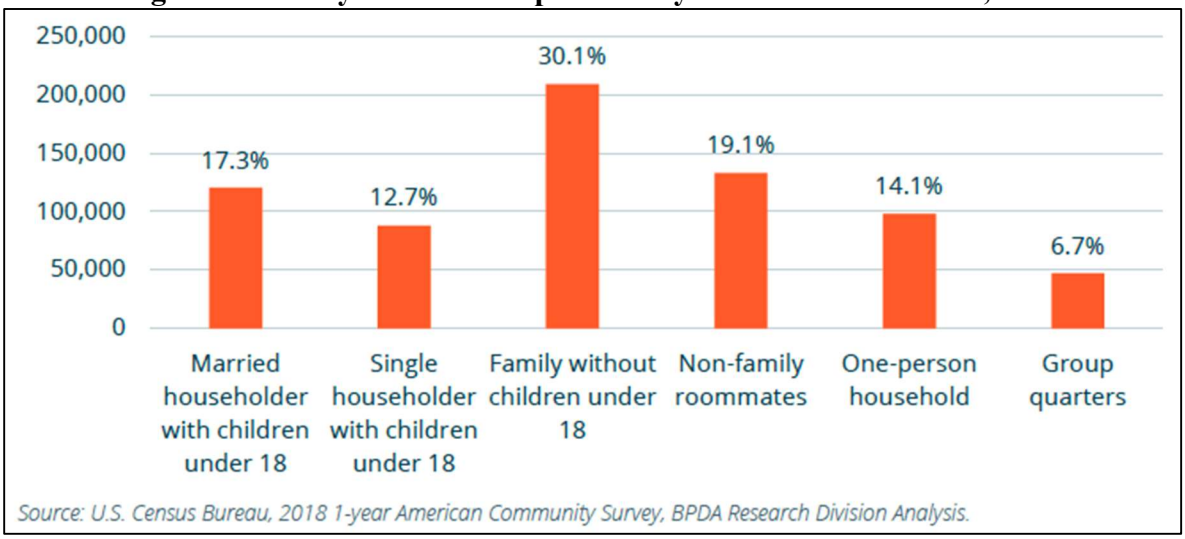
Of the 273,000 households in Boston in 2020, about half were family households and half were non-family households. The most common household size was 1 person (36%), followed by 2-person (33%), 4-or-more-person (16%), and 3-person households (16%). Data in **Figure 2-12** show households by type and by size. **Figure 2-13** shows more detail on household types in 2018, including families without children (30%), non-family roommates (19%), married households with children (17%), one-person households (14%), single households with children (13%), and group quarters (7%).

Figure 2-12. City of Boston Household Type and Size, 2020

Household Type - 5YR ACS 2016-2020		
Total Households	273,188	
Family Households **	130,052	47.6%
Non-Family Households	143,136	52.4%
Household Size - 5YR ACS 2016-2020		
Total Occupied Housing Units	273,188	
1-Person Household	98,340	36.0%
2-Person Household	88,817	32.5%
3-Person Household	42,226	15.5%
4-or-More Person Household	43,805	16.0%

Source: Boston Public Schools, Boston Public Schools at a Glance 2021-2022, BPDA Research Division Analysis.

Figure 2-13. City of Boston Population by Household Structure, 2018



Renter- and Owner-Occupied Households

In 2020, about 92% of housing units in Boston were occupied. Of occupied housing units, about 35% were occupied by owners and about 65% were occupied by renters (shown in **Figure 2-14**).

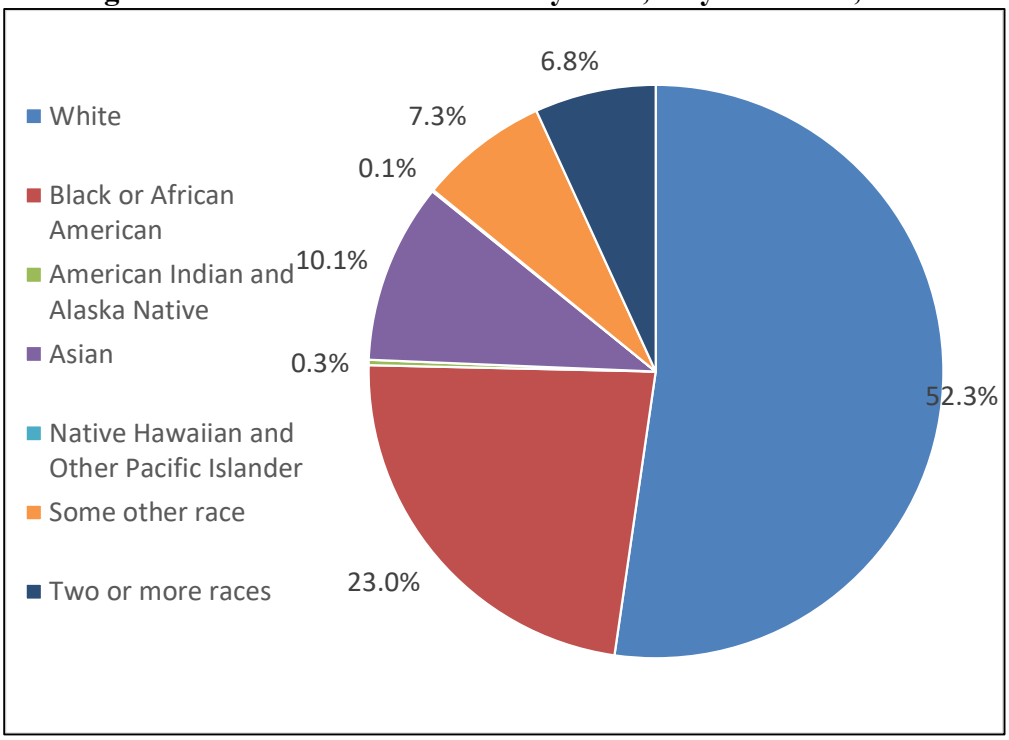
Figure 2-14. City of Boston Housing Units, 2020

Housing Units - 5YR ACS 2016-2020		
Total Housing Units	298,708	
Occupied	273,188	
Owner-Occupied	96,502	32.3%
Renter-Occupied	176,686	59.2%
Vacant	25,520	8.5%

Source: Boston Public Schools, Boston Public Schools at a Glance 2021-2022, BPDA Research Division Analysis.

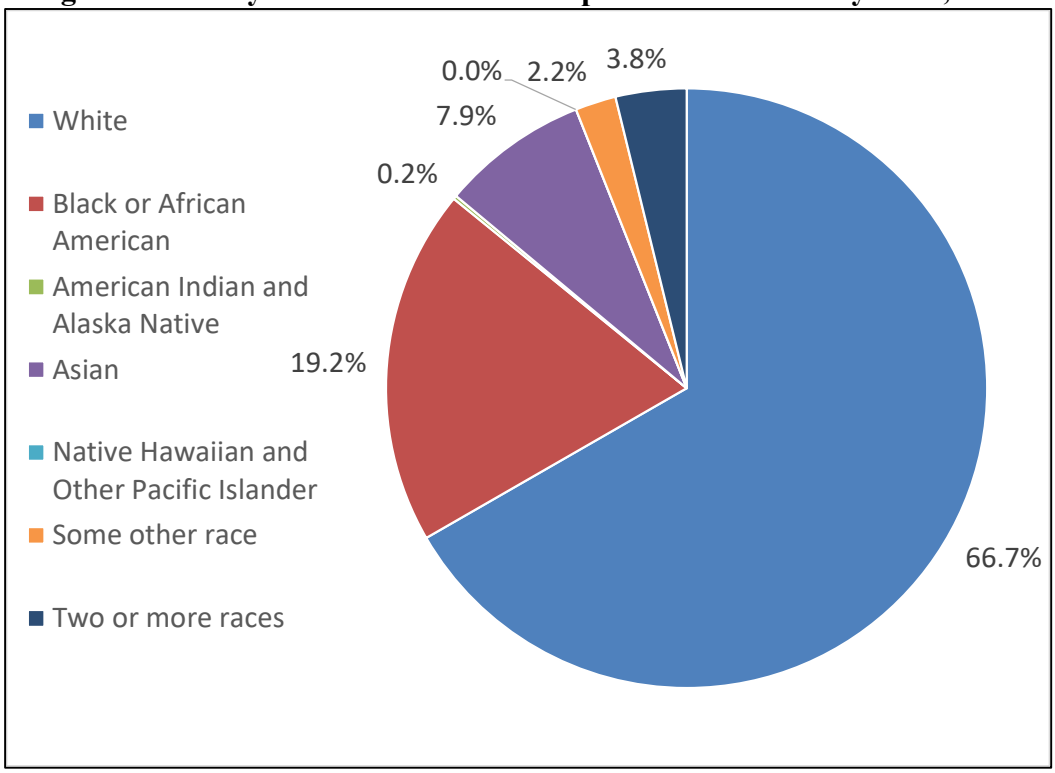
Figures 2-15 and **2-16** show the breakdown of renter- and owner-occupied households by race. While the percentage breakdown of renter households by race is like the population percentage breakdown, White households make up an outsized portion of homeowners. While Black or African American households make up more than 25 percent of the total population, they make up less than 20 percent of homeowners.

Figure 2-15. Renter Householder by Race, City of Boston, 2020



Source: U.S. Census Bureau, 2016 – 2020 5-Year American Community Survey; and ConsultEcon Inc.

Figure 2-16. City of Boston Owner Occupant Householder by Race, 2020



Source: U.S. Census Bureau, 2016 – 2020 5-Year American Community Survey; and ConsultEcon Inc.

Household Income Distribution

The median household income in Boston was $76,000 in 2020, with per capita income of $47,000. **Figure 2-17** shows a summary of median income and **Figure 2-18** shows income ranges for households by race in 2020.

Figure 2-17. City of Boston Household Income, 2020

Income (In 2020 Inflation-Adjusted Dollars)- 5YR ACS 2016-2020	
Per Capita Income	$46,845
Median Household Income	$76,298
Median Family Income	$89,270
Median Non-Family Income	$61,649

Source: Boston Public Schools, Boston Public Schools at a Glance 2021-2022, BPDA Research Division Analysis.

There is a distinct disparity of household incomes between racial groups, as shown by data in **Figure 2-18** and in **Figure 2-19**. White households account for 57 percent of all households. They make up 74 percent of households earning over $100,000. Black households account for 22 percent of all households and 12 percent of households earning over $100,000. Asian households account for 9 percent of households and 8 percent of households earning over $100,000. Moreover, the median household income for White Households, at $108,291 is over twice that of Black, Latino and Asian households, at $47,800, $43,337 and $52,326, respectively (see Figures 2-19 and 2-20).

Figure 2-18. City of Boston Households by Household Income Group and by Race, 2020

Income Group	White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some other race	Two or more races	Total	White Alone, Non-Hispanic	Hispanic or Latino	White, Hispanic
	Households by Household Income by Race										
Less than $24,999	24,853	18,266	268	8,638	0	6,660	4,203	62,888	18,894	16,809	10,850
$25,000 to $49,999	16,808	12,115	95	3,811	15	2,874	2,684	38,402	13,578	8,702	5,472
$50,000 to $74,999	17,126	9,232	113	2,658	39	1,748	2,512	33,428	15,008	6,054	3,936
$75,000 to $99,999	17,184	6,448	61	2,228	72	1,328	1,740	29,061	15,231	4,560	2,607
$100,000 to $149,999	30,212	6,775	59	3,059	0	1,235	2,216	43,556	27,649	4,906	2,343
$150,000 to $199,999	20,176	3,397	47	1,882	0	649	1,116	27,267	19,223	2,052	1,099
$200,000 or more	30,354	2,994	79	3,279	54	546	1,280	38,586	28,703	2,984	1,333
All Households	**156,713**	**59,227**	**722**	**25,555**	**180**	**15,040**	**15,751**	**273,188**	**138,286**	**46,067**	**27,640**

Income Group	White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some other race	Two or more races	Total	White Alone, Non-Hispanic	Hispanic or Latino	White, Hispanic
Median Household Income	$103,291	$47,800	$46,875	$52,326	$77,143	$32,218	$58,170	$76,298	$109,505	$43,337	
Percent of Households in Each Racial Group Earning Over $100,000	51.5%	22.2%	25.6%	32.2%	30.0%	16.2%	29.3%	40.0%	54.7%	21.6%	17.3%
Percent of Households by Race Earning Over $100,000	73.8%	12.0%	0.2%	7.5%	0.0%	2.2%	4.2%	100.0%	69.1%	9.1%	4.4%
Percent of All Households Earning Over $100,000	57.4%	21.7%	0.3%	9.4%	0.1%	5.5%	5.8%	100.0%	50.6%	16.9%	10.1%

Income Group	White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some other race	Two or more races	Total	White Alone, Non-Hispanic	Hispanic or Latino	White, Hispanic
	Percentage of Households by Income Group for Each Race										
Less than $24,999	15.9%	30.8%	37.1%	33.8%	0.0%	44.3%	26.7%	23.0%	13.7%	36.5%	39.3%
$25,000 to $49,999	10.7%	20.5%	13.2%	14.9%	8.3%	19.1%	17.0%	14.1%	9.8%	18.9%	19.8%
$50,000 to $74,999	10.9%	15.6%	15.7%	10.4%	21.7%	11.6%	15.9%	12.2%	10.9%	13.1%	14.2%
$75,000 to $99,999	11.0%	10.9%	8.4%	8.7%	40.0%	8.8%	11.0%	10.6%	11.0%	9.9%	9.4%
$100,000 to $149,999	19.3%	11.4%	8.2%	12.0%	0.0%	8.2%	14.1%	15.9%	20.0%	10.6%	8.5%
$150,000 to $199,999	12.9%	5.7%	6.5%	7.4%	0.0%	4.3%	7.1%	10.0%	13.9%	4.5%	4.0%
$200,000 or more	19.4%	5.1%	10.9%	12.8%	30.0%	3.6%	8.1%	14.1%	20.8%	6.5%	4.8%
All Households	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Income Group	White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some other race	Two or more races	Total	White Alone, Non-Hispanic	Hispanic or Latino	White, Hispanic
	Percentage of Households by Race for Each Income Group										
Less than $24,999	39.5%	29.0%	0.4%	13.7%	0.0%	10.6%	6.7%	100.0%	30.0%	26.7%	17.3%
$25,000 to $49,999	43.8%	31.5%	0.2%	9.9%	0.0%	7.5%	7.0%	100.0%	35.4%	22.7%	14.2%
$50,000 to $74,999	51.2%	27.6%	0.3%	8.0%	0.1%	5.2%	7.5%	100.0%	44.9%	18.1%	11.8%
$75,000 to $99,999	59.1%	22.2%	0.2%	7.7%	0.2%	4.6%	6.0%	100.0%	52.4%	15.7%	9.0%
$100,000 to $149,999	69.4%	15.6%	0.1%	7.0%	0.0%	2.8%	5.1%	100.0%	63.5%	11.3%	5.4%
$150,000 to $199,999	74.0%	12.5%	0.2%	6.9%	0.0%	2.4%	4.1%	100.0%	70.5%	7.5%	4.0%
$200,000 or more	78.7%	7.8%	0.2%	8.5%	0.1%	1.4%	3.3%	100.0%	74.4%	7.7%	3.5%
All Households	**57.4%**	**21.7%**	**0.3%**	**9.4%**	**0.1%**	**5.5%**	**5.8%**	**100.0%**	**50.6%**	**16.9%**	**10.1%**

Source: U.S. Census Bureau American Community Survey, 2020 (5-year) and ConsultEcon, Inc.

Figure 2-19. City of Boston Households Earning Over $100,000 by Race, 2022

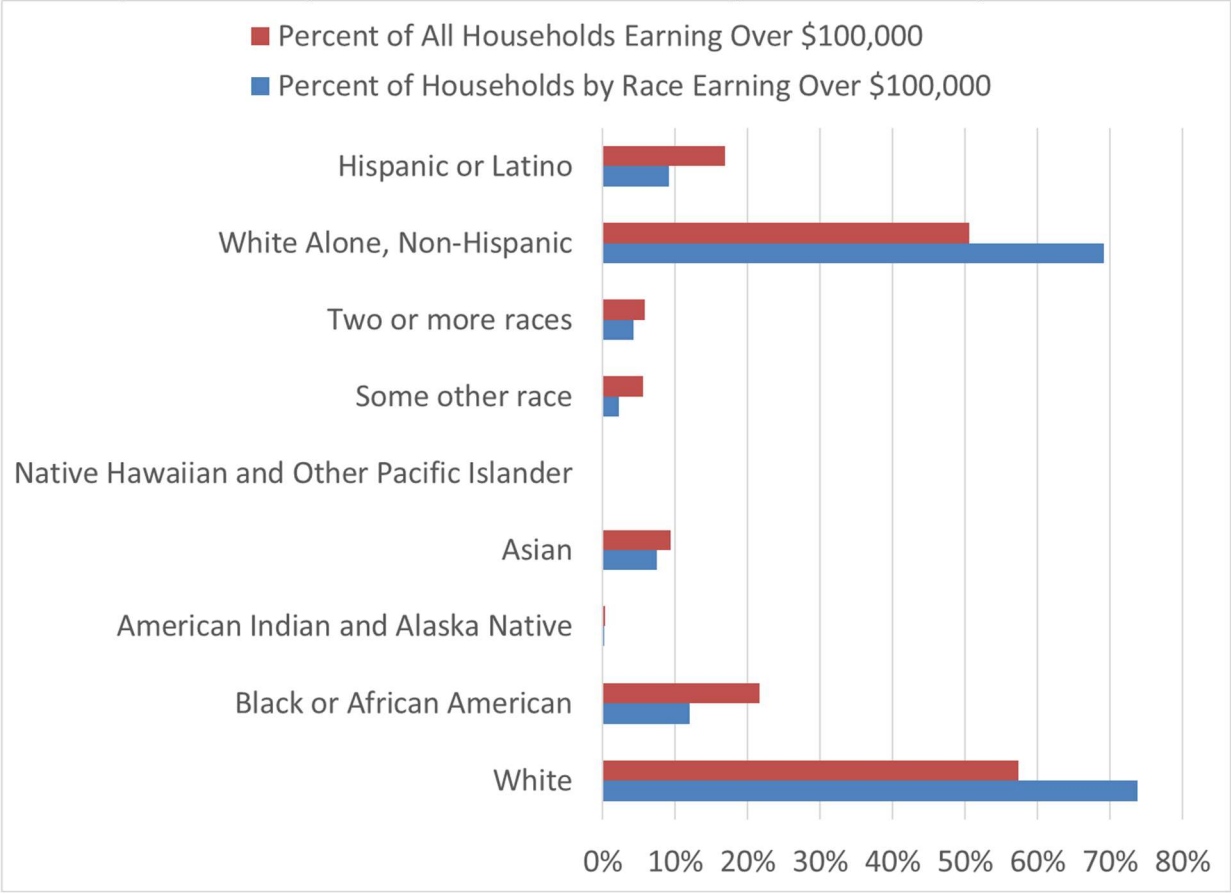
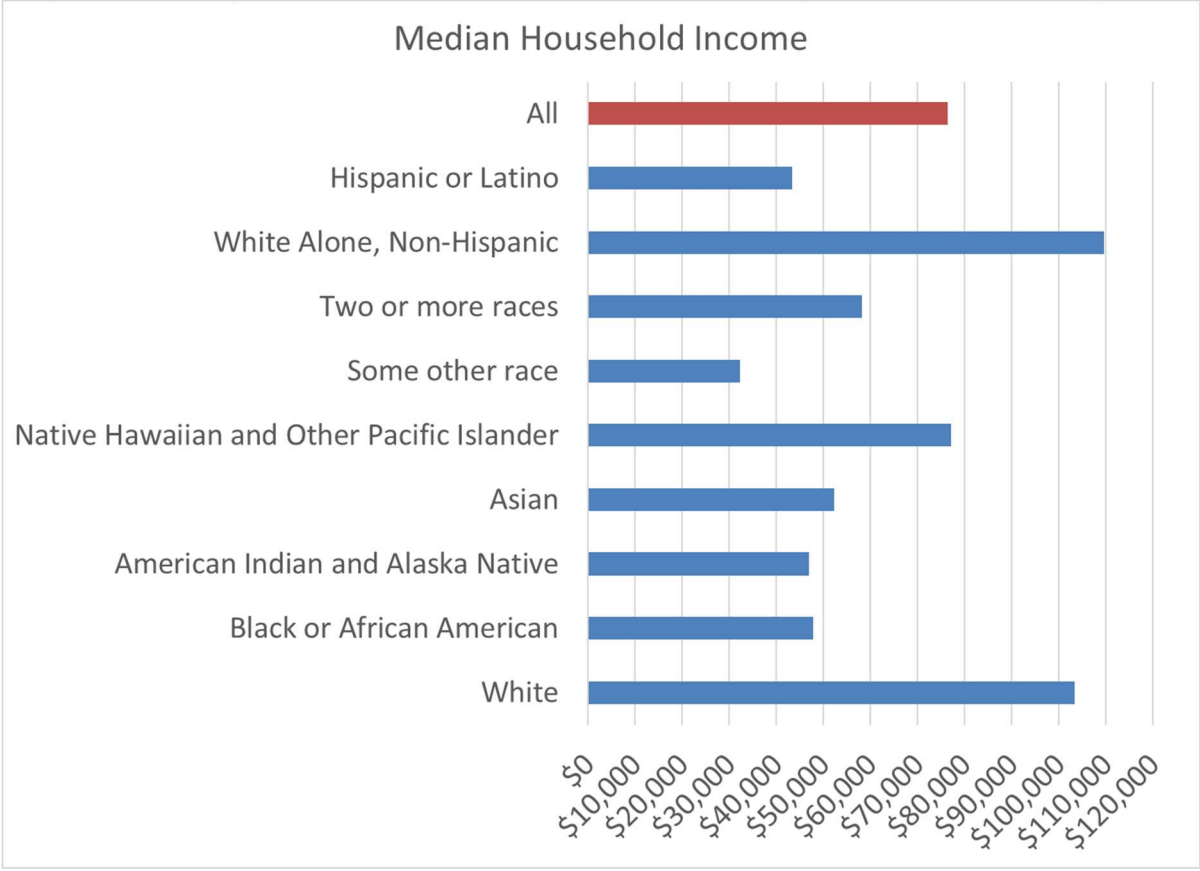


Figure 2-20. City of Boston Households Median Income by Racial/Ethnic Group, 2020



Source: U.S. Census Bureau American Community Survey, 2020 (5-year) and ConsultEcon, Inc.

Household Wealth / Net Worth

Figure 2-21 shows a comparison of median net worth for racial and ethnic groups in the Greater Boston Metro Area from *The Color of Wealth in Boston*, a report from the Federal Reserve Bank of Boston published in 2015[12]. While White households had a median net worth of close to $250,000, U.S.-born Black households had a median net worth of only $8 and Dominican households had median net worth of $0. Caribbean-born Black households and NEC (not elsewhere categorized, mainly respondents that chose more than one race) had median net worth of about $12,000, and Puerto Rican and Other Hispanic households had net worth of $3,000 and $2,700, respectively.

[12] Federal Reserve Bank of Boston, *The Color of Wealth*, 2015.

Figure 2-21. Greater Boston Comparison of White and Non-White Household Median Net Worth, 2015

	Median net worth	
	Amount (U.S. dollars)	Nonwhite household percentage of white household median net worth
White	247,500	100.0
U.S. Black	8	0.0***
Caribbean Black	12,000	4.8***
Cape Verdean[b]	–	–
Puerto Rican	3,020	1.2***
Dominican	0	0.0***
Other Hispanic	2,700	1.1***
NEC[a]	12,000	4.8***

Source: NASCC survey, authors' calculations
Note: Difference in findings of nonwhite household median or mean net worth values were statistically significant at the ***99 percent level.
[a] The "not elsewhere classified" (NEC) category includes mainly respondents that chose more than one race.
[b] Net worth values for Cape Verdeans were not calculated because sample sizes were too small.

As of May 2022, a new study will be conducted over 3 years to provide more in depth and accurate data on the underlying causes of the wealth gap, including the outsized impact of student debt on Black families and the engagement of members of the Black community in the high-growth and high-paying life sciences industry in Massachusetts[13]. The 2015 report had small sample sizes – about 70 households led by US-born Black people, 80 white-led households, 130 Hispanic households, and 14 households with Asian backgrounds. The new study is intended "to be broader, to cover racial inequities statewide, with bigger samples (3,000 to 5,000 people) to consider and a broader variety of ethnic groups," according to Boston Fed Executive Vice President Prabal Chakrabarti. The report will also point to strategies to reduce and ultimately eliminate wealth disparities.

English Proficiency and Languages Spoken

Data in **Figure 2-22** show English proficiency for the population of Boston age 5 years and older. About 37% of the population speaks another language at home and about 46% speak English "less than very well". **Figure 2-23** shows the languages spoken by the population age 5 years and older.

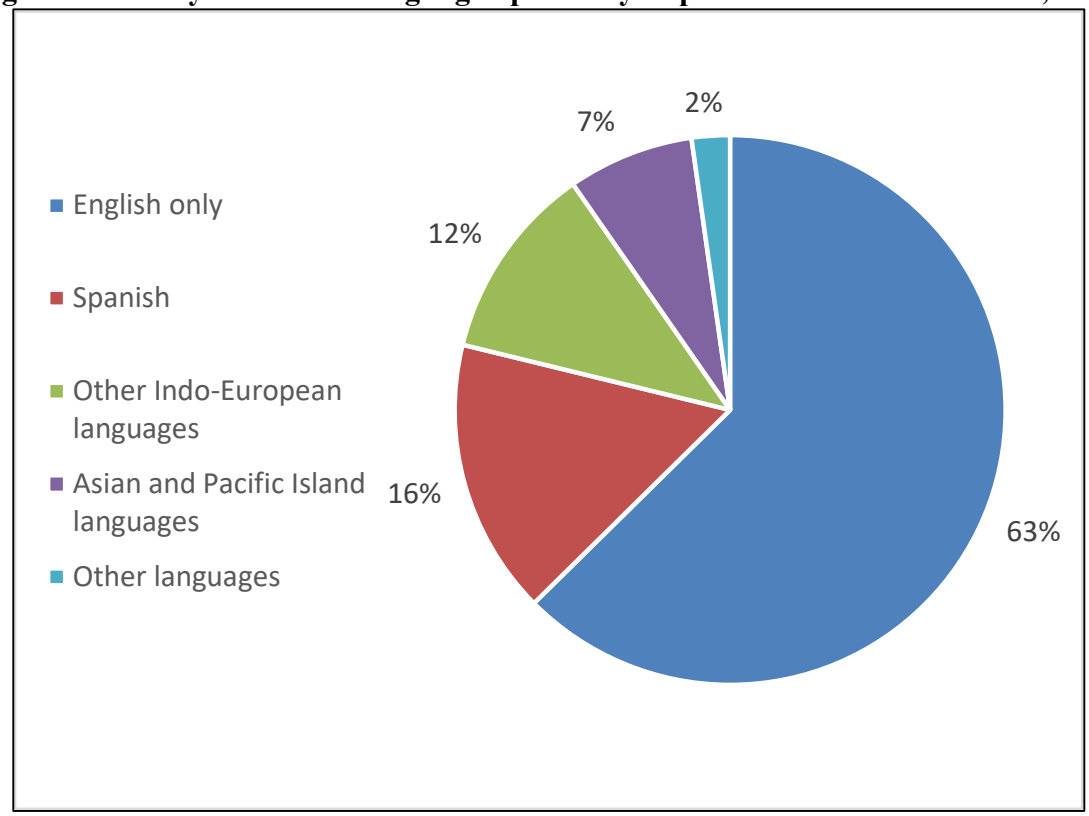
[13] Boston Globe, "Fed, business groups to update study that found average Black Boston household had net worth of $8," May 9, 2022. (Link).

Figure 2- 22. City of Boston English Proficiency, 2020

English Proficiency - 5YR ACS 2016-2020		
Total Population (5 Years and Over)	655,287	
Speak Only English at Home	412,091	62.9%
Speak Another Language at Home	243,196	37.1%
Speak English "Very Well"	132,250	54.4%
Speak English "Less than Very Well"	110,946	45.6%

Source: Boston Public Schools, Boston Public Schools at a Glance 2021-2022, BPDA Research Division Analysis.

Figure 2-23. City of Boston Language Spoken by Population Over 5 Years Old, 2020



Source: U.S. Census Bureau, 2016 – 2020 5-Year American Community Survey; and ConsultEcon Inc.

Summary

Given the percentage of people in poverty, the number of low-, moderate- and middle-income households, combined with the higher percentage of renter and owner households that are cost burdened, there is a need for affordable housing. Building affordable housing and lowering housing costs means that households are more able to spend on other important categories, such as food, child care and other spending that support households. There is a need to raise incomes, especially for lower income racial and ethnic population groups with higher poverty rates and lower incomes. The new commercial development in the city offers the potential for jobs at new development to help address the need for increasing incomes among Boston's households.

4.0 KEY DEMOGRAPHIC TRENDS, 2010 TO 2020

Population and Household Growth

Figure 2-24 shows the Boston population by decade from 1900 to 2020. Since reaching a low point in 1980, the city has steadily grown in population. From 2010 to 2020, the population grew from 618,000 to 676,000 – about 9%. **Figure 2-25** shows the average household size in Boston from 1950 to 2020. While household size continues to decline, the rate of decline has flattened, decreasing less than 1% from 2010 to 2020.

Figure 2-24. City of Boston Population by Decade, 1900 to 2020

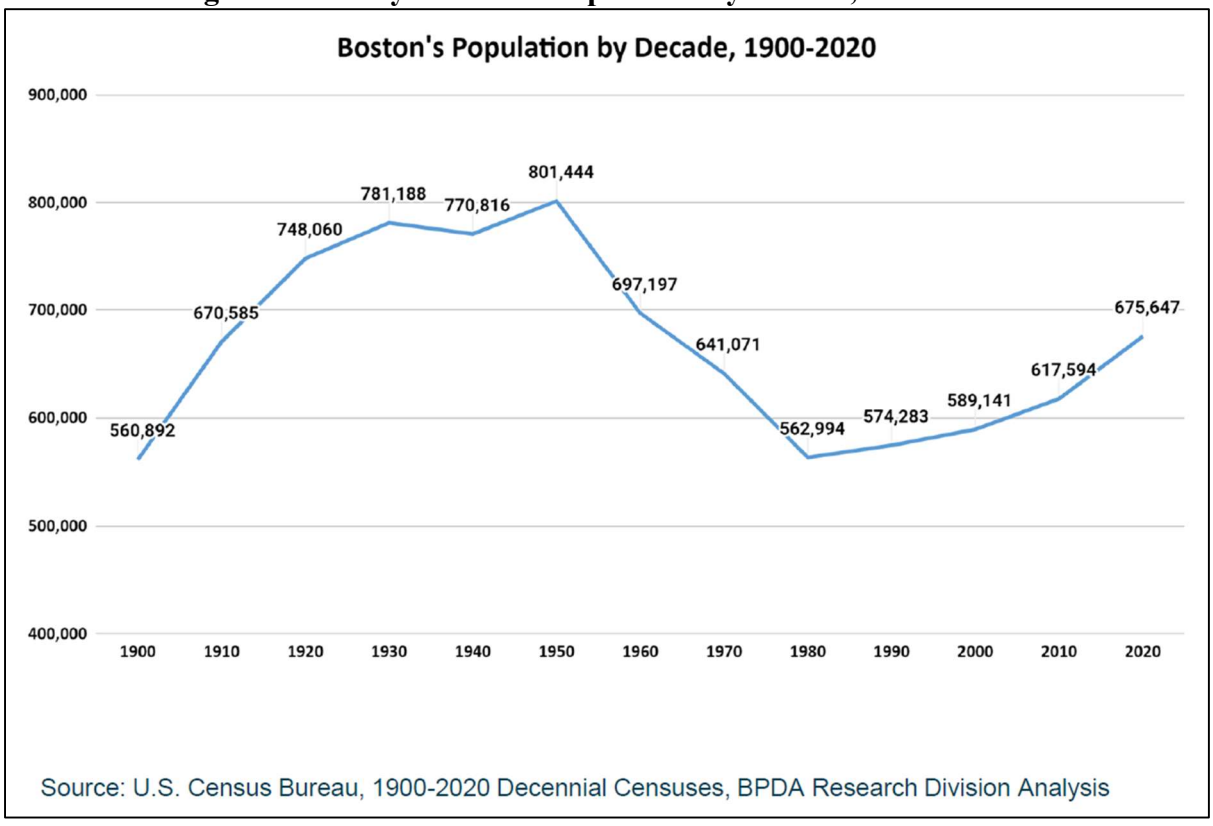
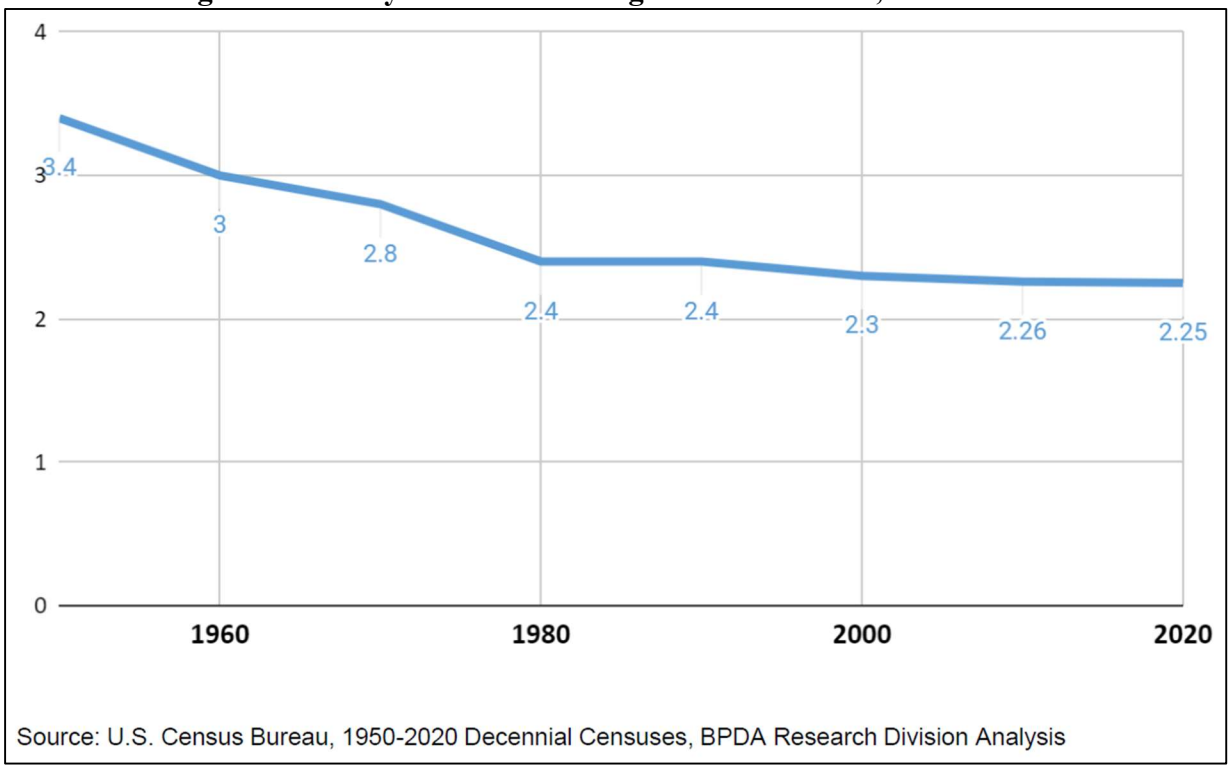


Figure 2-25. City of Boston Average Household Size, 1950 to 2020



Note: The average household size reported by the American Community Survey 5-Year Estimates (2016 to 2020) was 2.35 persons. The data in this graph is from the decennial census, which reported 2.25 persons.

Changes in Racial Composition of Population

The city of Boston has become more diverse over time, as shown in **Figure 2-26**. From 2010 to 2020, the city's White population continued to represent a smaller portion of the total population, while Black / African American, Hispanic, or Latino, and Asian / Pacific Islander populations, as well as those of some other or two or more races, represent a larger percentage. The Hispanic/Latino and Asian/Pacific Islander share of Boston's population have grown over the last two decades while the share of White Alone and Black/African-American has declined. **Figure 2-27** shows the population by race and ethnicity for children under 18. Children had greater diversity than the total population.

Figure 2-26. City of Boston Population by Race and Ethnicity, 1970 to 2020

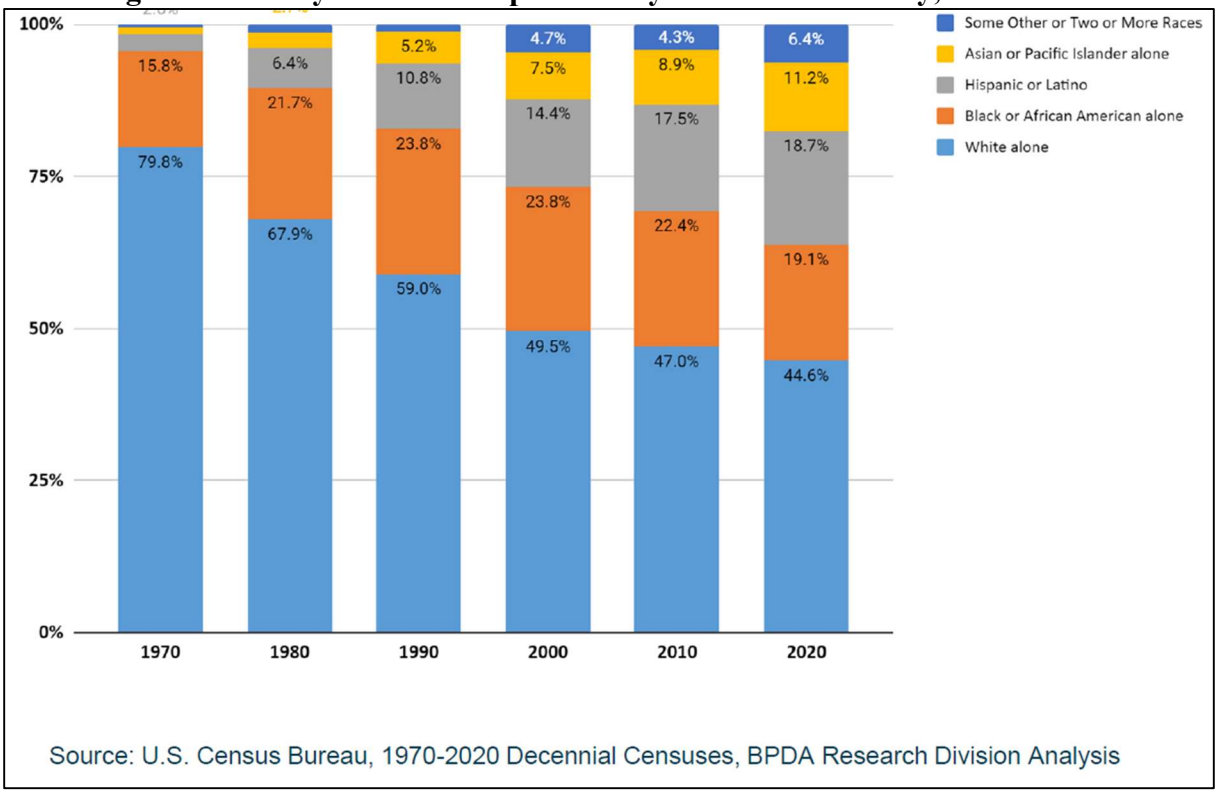
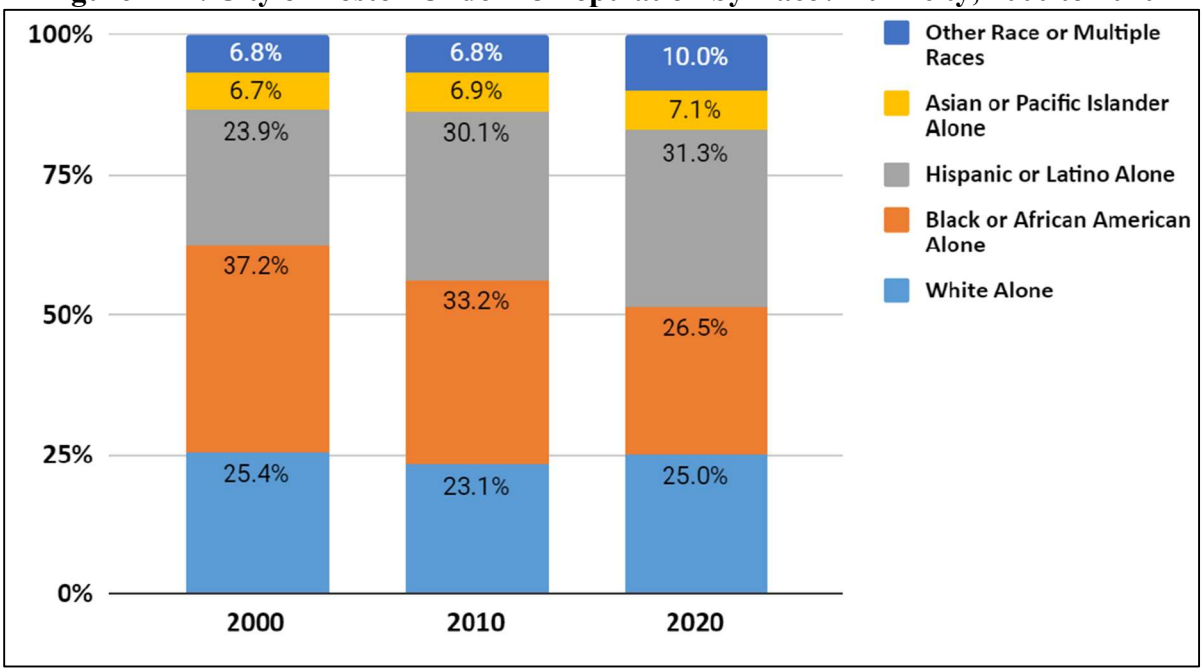


Figure 2-27. City of Boston Under 18 Population by Race / Ethnicity, 2000 to 2020

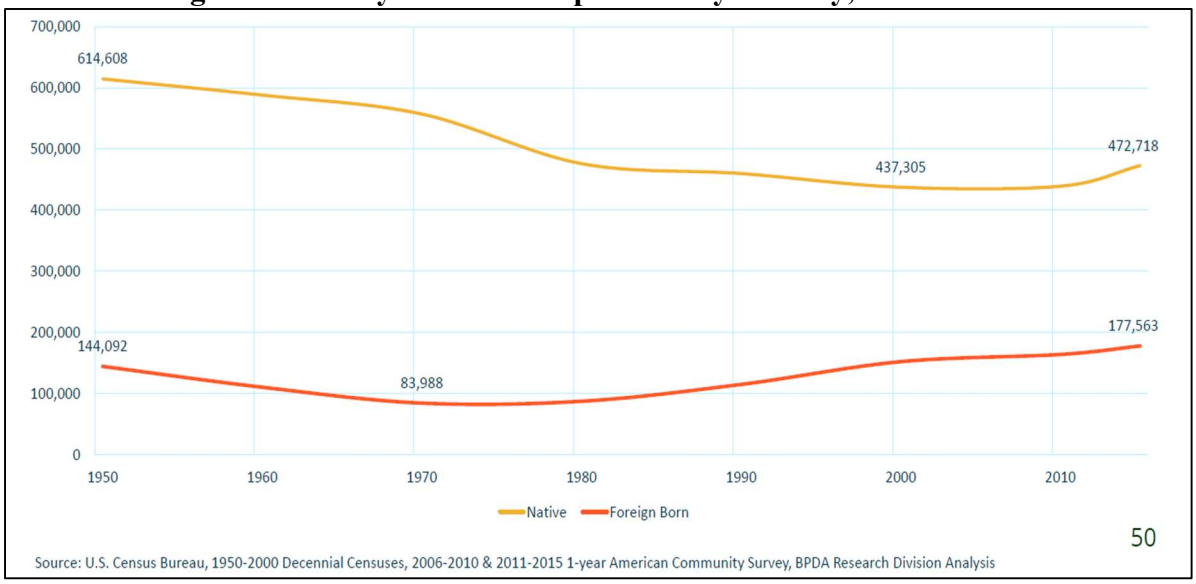


Source: US Census Bureau 2000 to 2020 Census and BPDA Research Division Analysis

Change in Foreign-Born Population

Boston's foreign-born population has more than doubled since 1970. **Figure 2-28** shows the change in Boston's population's nativity from 1950 to 2015. From 2015 to 2020, the population of foreign-born residents grew from 178,000 to 194,000 – an increase of 9%.

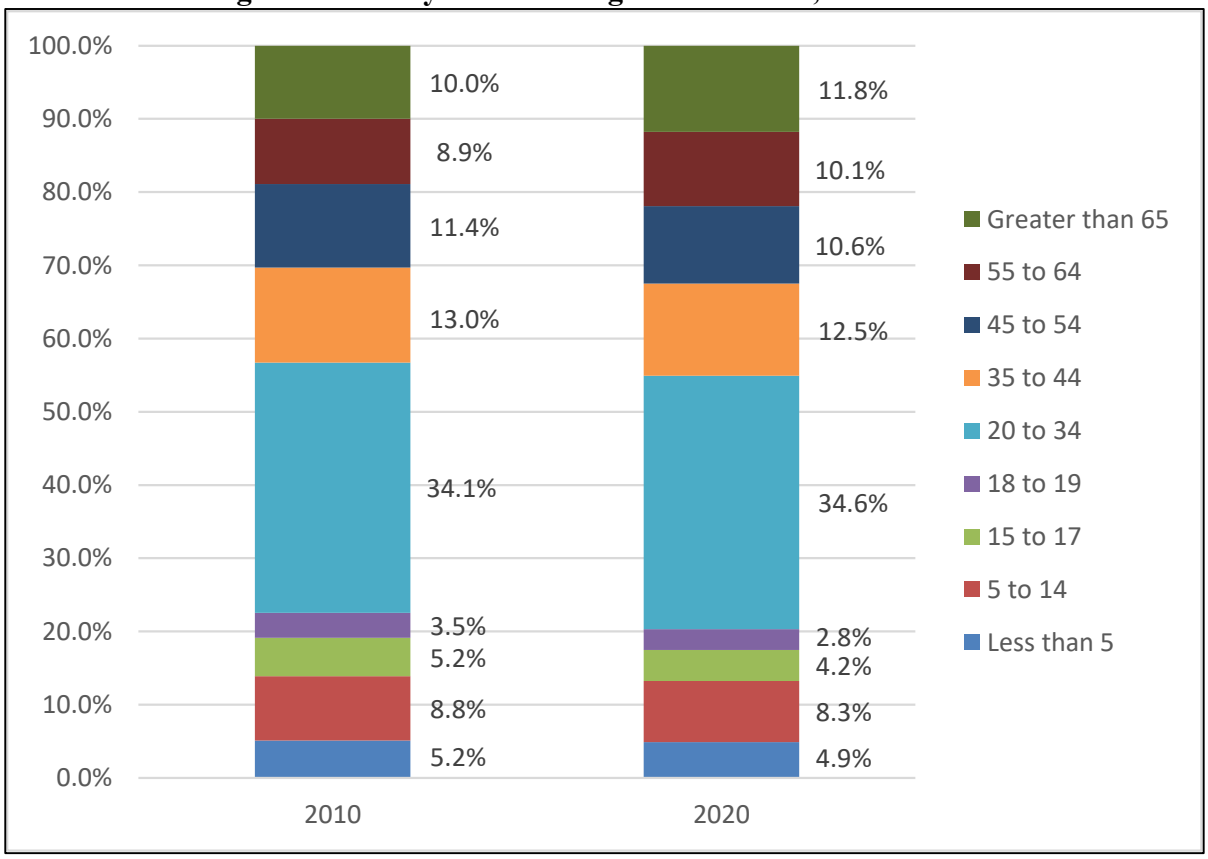
Figure 2-28. City of Boston Population by Nativity, 1950 to 2015



Changes in Age Distribution of Population

Figure 2-29 shows the age distribution of the population of Boston from 2010 to 2020. The population over age 55 and from 20 to 34 increased from 2010 to 2020, while other age groups decreased during the period.

Figure 2-29. City of Boston Age Distribution, 2010 to 2020

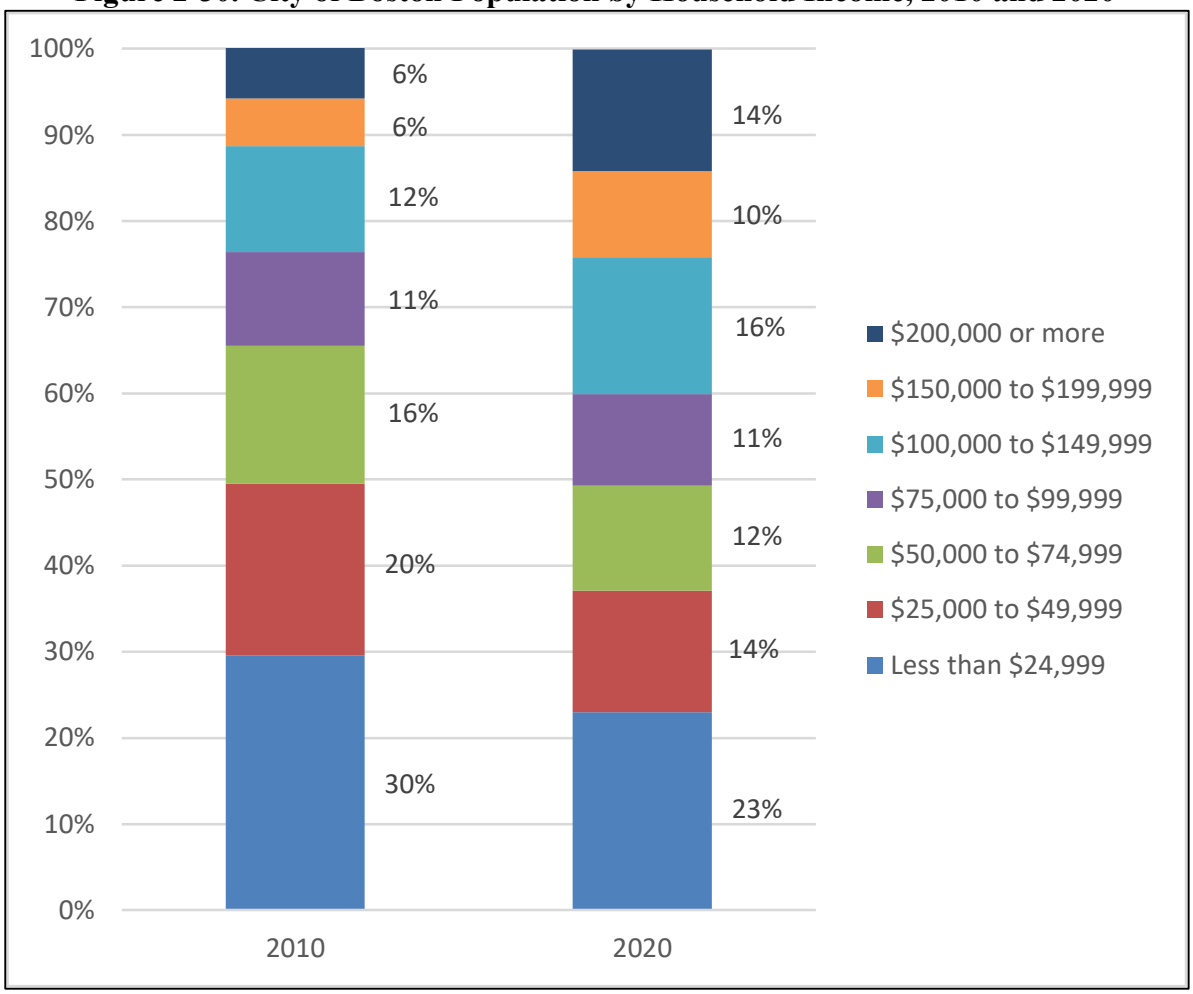


Source: U.S. Census Bureau, 2016 – 2020 and 2006 – 2010 5-Year American Community Survey; and ConsultEcon Inc.

Changes in Income Distribution of Population

From 2010 to 2020, the percentage of Boston's households making $100,000 or more grew from about 24% to 40%, as shown in **Figure 2-30** while the share of households with incomes below $75,000 dropped from 66% to 49% . The city's median household income increased during the period from about $51,000 to $76,000.

Figure 2-30. City of Boston Population by Household Income, 2010 and 2020

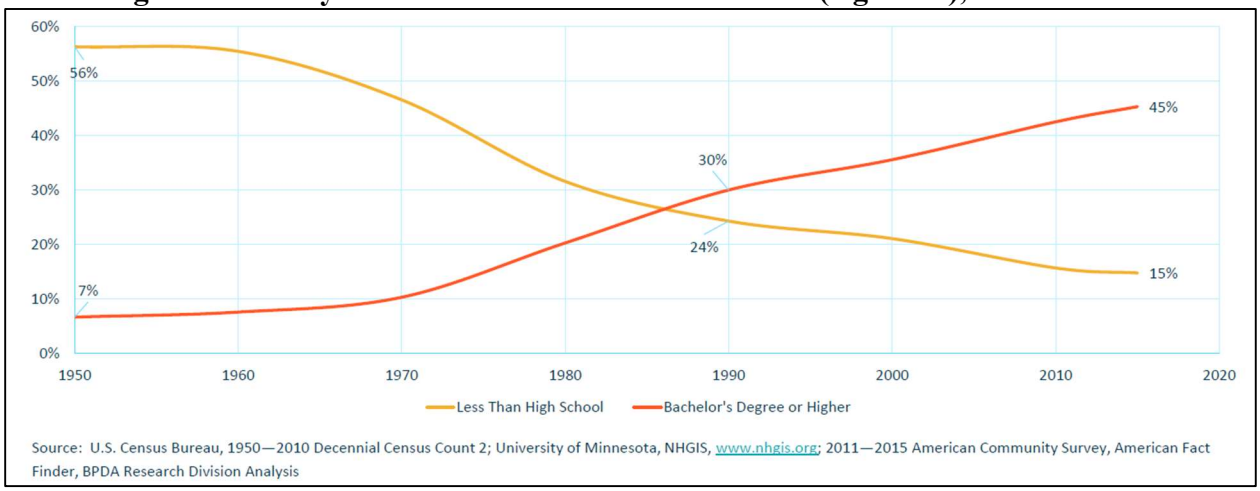


Source: U.S. Census Bureau, 2016 – 2020 and 2006 – 2010 5-Year American Community Survey; and ConsultEcon Inc.

Changes in Educational Attainment of Population

Figure 2-31 shows the change in educational attainment from 1950 to 2015. The share of the population over age 25 with a bachelor's degree or higher has continued to grow since the 1980s, and the population with less than a high school diploma has declined.

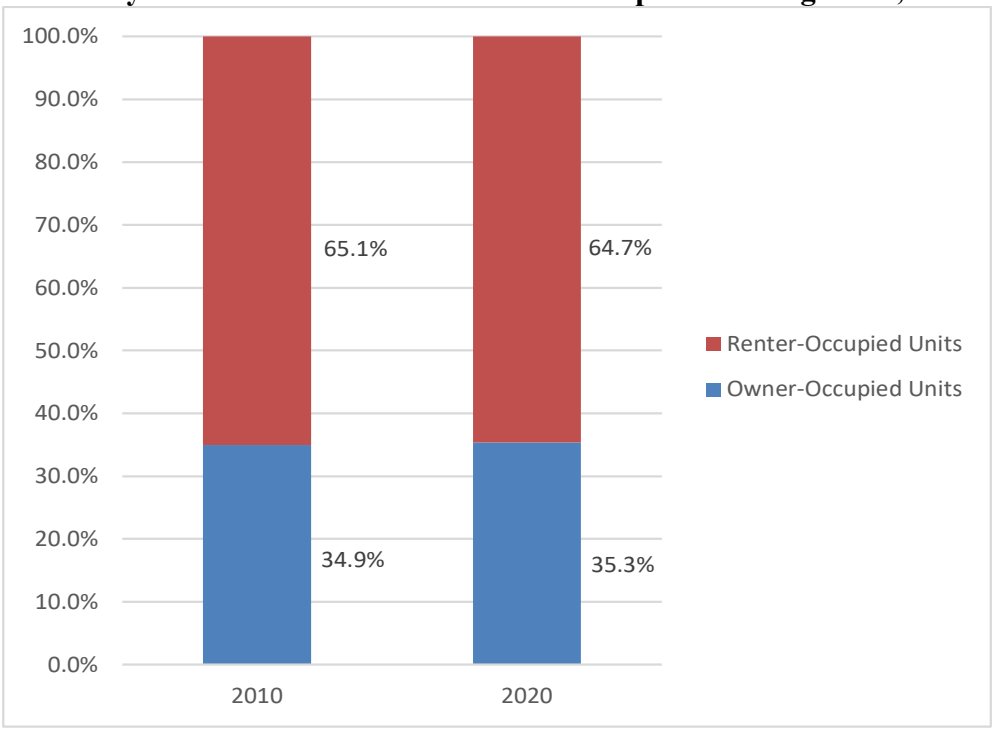
Figure 2-31. City of Boston Educational Attainment (Age 25 +), 1950 to 2015



Changes in Renter- and Owner-Occupied Housing

The percentage of renter- and owner-occupied units stayed fairly steady from 2010 to 2020, shown in **Figure 2-32**.

Figure 2-32. City of Boston Renter- and Owner-Occupied Housing Units, 2010 to 2020



Source: U.S. Census Bureau, 2016 – 2020 and 2006 – 2010 5-Year American Community Survey; and ConsultEcon Inc.

5.0 Boston Labor Force Profile and Trends

This labor force profile and review of labor force trends in Boston utilizes three primary data sources: (1) the 2016-2020 American Community Survey (ACS); (2) comparative data from the 2006-2010 ACS; and (3) Bureau of Labor Statistic Local Area Unemployment data provided by the Massachusetts Department of Unemployment Assistance. ACS data provides five-year estimates, summarizing data from 2016 to 2020, for a range of labor force characteristics and outcomes by age, gender and race while the state data provides the most recent information on overall labor force size, participation and unemployment. For the purpose of this section, ACS five-year estimates are referred to by the last year of their period, either 2010 or 2020. The data analysis is supplemented with qualitative and quantitative information for several recent studies.

Labor Force Profile

Overview. In 2020, Boston's labor force participation rate was 69.8% with 413,366 residents aged 16 and over in the labor force. While there is roughly even representation of men and women in the labor force (49.4% and 50.6% respectively), men's participation rate is slightly higher at 72.5% while women's participation rate is 67.4%.[14] To contextualize Boston's labor force participation rate within the region, the state of Massachusetts experienced its lowest labor force participation rate in March 2020 at 60.5%, though the figure has stabilized at around 65.5% since June 2020.[15] As such, Boston's labor force participation rate continues to exceed that of the state average by roughly four to five percentage points. State estimates for March 2022 show a decline in Boston's labor force by over 16,000 to 397,064[16]. The city's unemployment rate in 2020 was 6.90%, according to the ACS. More recent state estimates report a reduced unemployment rate of 3.1%, below the statewide rate of 4.3%.[17] While slightly above the pre-pandemic rate of 2.7% in 2019, it marks a major reduction in unemployment from Boston's peak of 15.8% in May and June, 2020[18].

Table 2-5. Boston Labor Force Size, Participation Rate, and Unemployment Rate by Educational Attainment, ACS 2016-2020

Educational Attainment Level	Population Count	Labor Force Participation Rate	Unemployment Rate
Less than high school	37,552	66.9%	11.2%
High school graduate (or equivalent)	68,796	75.0%	8.8%
Some college or associate's degree	71,146	81.9%	7.4%
Bachelor's degree or higher	220,086	89.5%	3.4%

Source: U.S. Census Bureau (2020). *2016-2020 American Community Survey 5-Year Estimates*.

[14] Boston Planning and Development Agency Research Division, "Boston at a Glance – 2022."
[15] U.S. Bureau of Labor Statistics, "Labor Force Participation Rate for Massachusetts," retrieved from FRED, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series/LBSSA25.
[16] Massachusetts Department of Unemployment Assistance *Statewide Report: Labor Force and Unemployment Rate.* February 2022.
[17] US Bureau of Labor Statistics LAUS Program download at https://www.bls.gov/lau/ .
[18] US Bureau of Labor Statistics LAUS Program download at https://www.bls.gov/lau/ .

Labor force participation rates were lowest and unemployment rates highest in 2020 for individuals with less than a high school level education, at 66.0% and 11.2%, respectively. Labor participation rates increased and unemployment rates declined consistently at higher levels of education (See **Table 2-5**). Labor participation reached 89.5% and the unemployment rate was at 3.4% for individuals with a Bachelor's degree or higher. Individuals between 16 and 24 years of age, likewise, experienced higher unemployment rates and lower labor force participation during this time period relative to other age cohorts. Labor force participation and employment rates peaked for workers between 30 and 44 years old (See **Table 2-6**).

Table 2-6. Boston Labor Force Size, Participation Rate, and Unemployment Rate by Age, ACS 2016-2020

Age Group	Population Count	Labor Force Participation Rate	Unemployment Rate
16-19 years	42,445	40.5%	24.1%
20-24 years	70,569	66.5%	10.7%
25-29 years	93,848	86.0%	5.8%
30-34 years	74,379	89.8%	3.7%
35-44 years	86,463	88.1%	5.5%
45-54 years	73,036	82.9%	7.3%
55-59 years	37,249	74.1%	6.1%
60-64 years	32,605	61.7%	5.0%
65-74 years	46,846	31.4%	5.1%
75 years and over	34,438	7.6%	5.1%

Source: U.S. Census Bureau (2020). *2016-2020 American Community Survey 5-Year Estimates*.

Table 2-7. Boston Population 16+, Participation Rate, and Unemployment Rate by Race/Ethnicity, ACS 2016-2020

Race/Ethnicity	Population Count	Labor Force Participation Rate	Unemployment Rate
White	323,682	72.8%	5.3%
White alone, not Hispanic or Latino	282,781	73.1%	4.9%
Black or African American	133,971	67.8%	9.9%
American Indian and Alaska Native	1,778	50.9%	8.1%
Asian	60,991	59.2%	6.2%
Native Hawaiian and Other Pacific Islander	323	82.0%	1.9%
Other Race	34,586	66.8%	10.9%
Two or More Races	36,547	72.4%	8.3%
Hispanic or Latino origin (any race)	104,328	69.7%	9.2%

.

Considerable racial disparity in Boston's labor participation and unemployment rates exists (See **Table 2-7**). With the exception of the small Native Hawaiian and Other Pacific Islander labor force, White, non-Hispanic workers had the highest labor participation rate, at 73.1% and lowest unemployment rate, 4.9%, in 2020. Unemployment rates were highest, and over twice that of White, non-Hispanic workers, for individuals who identify as another race/ethnicity only (10.9%) and for Black or African American Bostonians (9.9%). Hispanic/Latino workers and those of two or more races also experienced high unemployment rates, at 9.2% and 8.3%, respectively. Labor

force participation rates, for 2020, were lowest among Boston's American Indian and Alaska Native population (50.9%) as well as the Asian population (59.2%).

Occupational Composition

Table 2-8 shows the distribution of occupations for Boston's employed residents over the age of 16 by race. Since earnings vary by occupation, with management, business and science occupations typically providing higher pay than service, sales/office and production/transportation ones, this data indicates how racial disparities in occupational employment contribute to racial income inequality. Almost half (49.9%) of Boston workers were employed in management, business, science, or arts occupations. However, two-thirds of White workers and almost 59% of Asian workers held jobs in these higher paying occupations, compared to 31.4% for Black/African American workers, 30.4% for Hispanic or Latino workers, 35.9% for workers with Two or More races and 28.7% for those identifying as Other Race. The majority of employed Black/African American (52.4%) and Hispanic/Latino (53.1%) Bostonians worked in service and sales/office occupations in 2020. Non-white workers were also far more likely to work in Production/Transportation and Material Moving occupations, ranging from 6.3% for Asians to 26.9% for Native Hawaiian and Pacific Islanders, compared to only 3.2% for White workers.

Table 2-8. Occupational Composition of Boston's Employed Population 16+ by Race, 2020

Race/Ethnicity	Total Employed Population	Percent in management, business, science, and arts occupations	Percent in service occupations	Percent in sales and office occupations	Precent in natural resources, construction, and maintenance occupations	Percent in Production, transportation, and material moving occupations
Asian	33,883	58.7%	18.7%	14.0%	2.4%	6.3%
Black or African American	81,654	31.4%	30.3%	22.1%	4.6%	11.6%
Hispanic or Latino	66,015	30.4%	34.1%	19.0%	6.5%	10.0%
American Indian and Alaska Native	832	34.5%	25.5%	16.1%	10.7%	13.2%
Native Hawaiian and Other Pacific Islander	260	27.7%	24.6%	8.5%	12.3%	26.9%
White	196,210	66.7%	9.6%	17.7%	2.8%	3.2%
Two or More Races	24,182	35.9%	31.5%	17.9%	6.2%	8.4%
Other Race	20,569	28.7%	33.3%	19.7%	7.8%	10.4%
Total, All Races	423,605	49.9%	20.6%	18.6%	4.1%	6.8%

Source: U.S. Census Bureau (2020). *2016-2020 American Community Survey 5-Year Estimates*.

A recent study of the Boston metropolitan region found that Black/African-American workers and Hispanic/Latino workers are over-represented, compared to their percentage of the overall labor force, in occupations with lower pay and less benefits, such as health-care support, transportation and material moving, building and grounds cleaning worker and under-represented in higher-paying life, physical, and social sciences occupations; computer and mathematical jobs; architecture and engineering positions.[19] This study also found the Black and Hispanic/Latino workers in the Boston region are two to three times as likely as White workers to earn less than $15 per hour with Hispanic/Latino immigrants four times as likely. While these data refer to the

[19] Abbie Langston, Justin Scoggins, Matthew Walsh, *Advancing Workforce Equity In Boston: A Blueprint For Action*, National Equity Atlas, 2021

Boston region, similar patterns are likely to exist in Boston given the racial composition of its workforce and the occupation data presented above.

Employment by Industry

Reflecting Boston's employment base, the two largest industry sectors in which Boston residents were employed in 2020 are Educational, Healthcare, and Social services (31.07%); and Professional, Scientific, Management, Administrative, and Waste management services (18.20%). Boston residents employed in the first set of industries were primarily female (69.3%), while male workers were a higher share of Boston residents employed in all other industries except other services (Sed **Table 2-9**).

Table 2-9. Employed Boston Residents, 16+ by Industry, 2020

Industry	**Total**		**Male** *Count and Percent*		**Female** *Count and Percent*	
Agriculture, forestry, fishing, hunting, and mining	545	0.14%	431	79.1%	114	20.9%
Construction	13,146	3.42%	11,767	89.5%	1,379	10.5%
Manufacturing	16,433	4.28%	10,206	62.1%	6,227	37.9%
Wholesale trade	5,607	1.46%	3,582	63.9%	2,025	36.1%
Retail trade	31,017	8.07%	15,728	50.7%	15,289	49.3%
Transportation, warehousing and utilities	14,656	3.81%	11,001	75.1%	3,655	24.9%
Information	9,438	2.46%	5,058	53.6%	4,380	46.4%
Finance, insurance, real estate, rental, and leasing	34,911	9.09%	19,567	56.0%	15,344	44.0%
Professional, scientific, management, administrative, and waste management services	69,935	18.20%	38,367	54.9%	31,568	45.1%
Educational services, health care, and social assistance	119,399	31.07%	36,642	30.7%	82,757	69.3%
Arts, entertainment, recreation, accommodation, and food services	38,016	9.89%	20,973	55.2%	17,043	44.8%
Other services	16,520	4.30%	6,290	38.1%	10,230	61.9%
Public administration	14,617	3.80%	7,804	53.4%	6,813	46.6%
TOTAL	384,240					

Source: U.S. Census Bureau (2020). *2016-2020 American Community Survey 5-Year Estimates*.

Educational Attainment

Educational attainment is another important indicator of access to higher skill and higher paying employment. Over half (55%) of Boston's population age 25 or older had a bachelor's degree or higher in 2020 but educational attainment varied by race and ethnicity (see **Tables 2-10** and **2-11**). The highest share of adults with a bachelor's degree or higher was among Asians (54.4%), Native Hawaiian and Other Pacific Islander (50.9%), and White (67.3%) individuals. Black/African American and Hispanic/Latino adults had among the lowest percentage with a bachelor's degree or higher, at 19.8% and 25.7%, respectively. Hispanic/Latino adults had the highest concentration of individuals (28.1%) with less than a high school level education, followed by those identified as other race (27.1%) and two or more races (26.1%).

Table 2-10. Educational Attainment for Population Aged 25+, 2020

Educational Attainment Level	Population Count	Percent of Total Population Aged 25+
Less than High School	37,552	9.45%
High School Graduate (or equivalent)	68,796	17.30%
Some College or Associate's Degree	71,146	17.89%
Bachelor's Degree or Higher	220,086	55.36%

Source: U.S. Census Bureau (2010-2020). *2016-2020 American Community Survey 5-Year Estimates*.

Table 2-11. Educational Attainment by Race for Boston Population Aged 25+, 2020

Race	Total Population 25+	Percent Less than High School	Percent High School Graduate (or equivalent)	Percent Some College or Associate's Degree	Percent Bachelor's Degree or Higher
Asian	46,469	20.6%	14.4%	10.5%	54.4%
American Indian and Alaska Native	1,346	16.8%	21.9%	32.5%	28.8%
Black	103,103	18.6%	32.3%	29.7%	19.4%
Native Hawaiian and Other Pacific Islander	218	16.1%	7.3%	25.7%	50.9%
White	263,797	6.1%	13.6%	13.1%	67.3%
Two or More Races	28,367	26.1%	18.8%	17.3%	37.8%
Other Race	27,530	27.1%	30.4%	20.7%	21.9%
Total, All Races[1]	470,830	12.7%	19.1%	17.2%	51.0%
Hispanic or Latino	81,668	28.1%	26.3%	19.9%	25.7%

Source: U.S. Census Bureau (2020). *2016-2020 American Community Survey 5-Year Estimates*.
[1]Totals for ACS 2016-2020 estimates by race differ slightly from estimates for the total population 25+

English Language Proficiency

Among Bostonians five years or older, 243,196 (37.1% of the total population) reported speaking a language other than English at home in 2020, with Spanish representing the most common language spoken at home other than English (16.3%). French, Haitian, or Creole (5.1%) as well as Chinese (4.5%) were the second and third most common languages spoken at home other than

English amongst Boston's population. The East Boston, Dorchester, and Brighton neighborhoods had the highest concentration of individuals speaking those languages, respectively.

Table 2-12. English Language Proficiency of Population Five Years and Over, 2020

English Language Proficiency	2020 Population Count	Percent of Total Population
Speak Only English at Home	412,091	62.9%
Speak Another Language at Home	243,196	37.1%
Speak English "Very Well"	132,250	54.5%
Speak English "Less than Very Well"	110,946	45.6%
TOTAL	243,196	100%

Source: Boston Planning & Development Agency Research Division, "Boston in Context: Neighborhoods."

Labor Force Trends (2010-2020)

Boston's labor force increased by 17.9%, or 62,723 workers between 2010 and 2020, while its labor force participation rate increased by 1.3 percentage points. The city has likewise experienced an approximately 25% decline in its unemployment rate over the decade.

Table 2-13. Boston Labor Force Size, Participation Rate, and Unemployment Rate (2010-2020)

Year	Labor Force Size	Percent Change	Labor Force Participation Rate	Percent Change	Unemployment Rate	Percent Change
2020	413,366	17.9%	69.80%	1.90%	6.90%	-25.81%
2010	350,643		68.50%		9.30%	

Source: U.S. Census Bureau (2010-2020). *2016-2020 American Community Survey 5-Year Estimates* and *2006-2010 American Community Survey 5-Year Estimates*.

Management, business, science, and arts occupations represented the most common occupations for employed Boston residents in both 2010 and 2020. The share of employed workers in these occupations grew from 44.8% to 52.3%, while the number increased by 41.04%. Workers in sales and office occupations are the only occupation group in which the number of employed workers declined between 2010 and 2020, with a drop of 2.6%.

Table 2-14. Occupational Composition of Boston's Employed Workers (2010-2020)

Occupation type	2010 Total	2010 Percent	2020 Total	2020 Percent	Percent Change
Management, business, science, and arts	142,468	44.8%	200,933	52.3%	41.0%
Service	68,760	21.6%	73,164	19.0%	6.4%
Sales and office	72,815	22.9%	70,946	18.5%	-2.6%
Natural resources, construction, and maintenance	13,575	4.3%	14,596	3.8%	7.5%
Production, transportation, and material moving	20,224	6.4%	24,601	6.4%	21.6%
TOTAL	317,842	100%	384,240	100%	20.9%

Source: U.S. Census Bureau (2010-2020). *2016-2020 American Community Survey 5-Year Estimates* and *2006-2010 American Community Survey 5-Year Estimates*.

The educational attainment of Boston adults 25 and over increased between 2010 and 2020. The number with a bachelor's degree or a higher level of education has increased by almost 70,000, or 46.5% percent over the decade. Those with some college or an associate's degree increased by 15.6%. On the other hand, the number who were high school graduates (or equivalent) dropped by 3.3% while those with less than a high school education had a steeper decline of 10.1% in the last decade.

The percentage of Boston residents over 5 years old that spoke another language at home increased slightly from 35.5% in 2010 to 37.1% in 2020. English language proficiency changed little over the decade with the percentage of residents over 5 who speak only English or speak English very well remaining the same at 83% for the 2006-2010 and 2016-2020 ACS survey estimates.

Table 2-15. Educational Attainment of Population 25+ (2010-2020)

Educational Attainment Level	2010 Population Count	2020 Population Count	Percent Change
Less than High School	41,766	37,552	-10.1%
High School Graduate (or equivalent)	71,134	68,796	-3.3%
Some College or Associate's Degree	61,567	71,146	15.6%
Bachelor's Degree or Higher	150,231	220,086	46.5%

Source: U.S. Census Bureau (2010-2020). *2016-2020 American Community Survey 5-Year Estimates* and *2006-2010 American Community Survey 5-Year Estimates*.

Table 2-16. English Language Proficiency of Population 5+ (2010-2020)

English Language Proficiency	2010 Population Count	Percent of Total 2010 Population	2020 Population Count	Percent of Total 2020 Population
Speak Only English at Home	380,338	64.5%	412,091	62.9%
Speak Another Language at Home	209,200	35.5%	243,196	37.1%
Speak English Only or "Very Well"	NA	83.2%	544,341	83.1%
Speak English "Less than Very Well"	NA	16.8%	110,946	16.9%

Source: U.S. Census Bureau (2010-2020). *2016-2020 American Community Survey 5-Year Estimates* and *2006-2010 American Community Survey and 5-Year Estimates*.

Boston Labor Force and Inclusionary Employment

A key issue as Boston updates its jobs linkage policies is how well future employment growth generated from new development aligns with the city's existing workforce, especially for low-income and racial and ethnic communities that have historically lacked full access to jobs that provide a living wage and career advancement opportunities.

Labor Force Alignment with Industry and Employment Growth. A gap appears to exist between the type of jobs being created in many of Boston's high growth industries and the occupational profile of Boston's Black/African American, Hispanic/Latino and multi-racial work force. Key industries generating the most job growth over the last decade are information technology, life sciences, management and technical consulting and architectural and engineering services. All of these industries have 70% to 85% of their jobs in management, business, science, and arts occupations and their continued growth accompanying new development will create substantial demand for workers in these occupations. However, many Boston residents lack experience and skills in these occupations, as indicated by their low share of employment in these occupations in 2020. Less than 35% of Black/African American, Hispanic/Latino and multi-racial workers in 2020 were employed in these occupations. Investments in expanded education and training programs will be needed to address these occupational gaps for Boston residents, particularly its non-white workers, and connect them to the type of new job opportunities created by Boston's growing technology and professional services industries.

Opportunity and Employment Barriers. Many Boston residents, including low-income and non-white workers, face barriers to stable employment in better quality jobs. These barriers, discussed in several recent reports[20] on the city and regional workforce system, include:

- Basic education levels, limited English language abilities and financial literacy.

[20] These reports include: *Advancing Workforce Equity In Boston: A Blueprint For Action*, National Equity Atlas, 2021; Preparing for the Future of Work in the Commonwealth of Massachusetts; *The Future of Boston's Workforce: The path forward from COVID-19 Findings*, 2021; *Catapult Forward: Accelerating A Next-Generation Workforce Ecosystem In Greater Boston, 2019;* and *Preparing for the Future of Work in the Commonwealth of Massachusetts*, n.d.

- Criminal background checks.
- Transportation services, access and cost.
- Availability of affordable child-care.
- "Cultural fit" expectations in the job or application process.
- Computers and technology skills as more training and services are provided on-line.
- Basic professional/job readiness skills (e.g., punctuality, dress codes).
- Growing insecurity with increased risk of eviction, food insecurity, and mental health needs-all heightened with the pandemic.

Several themes on how workforce development programs are working to address these barriers include:

- Creating skill-building and employment programs customized to both employer and worker needs.
- A need for stronger bridge programs or "onramps" from basic skills trainings into more advanced courses.
- A growing need for "wraparound services" to address insecurity, mental health and other needs, delivered in partnership with other service providers.

Future investments to connect unemployed and underemployed Boston residents to new jobs created at new development projects will need to address many of these employment barriers.

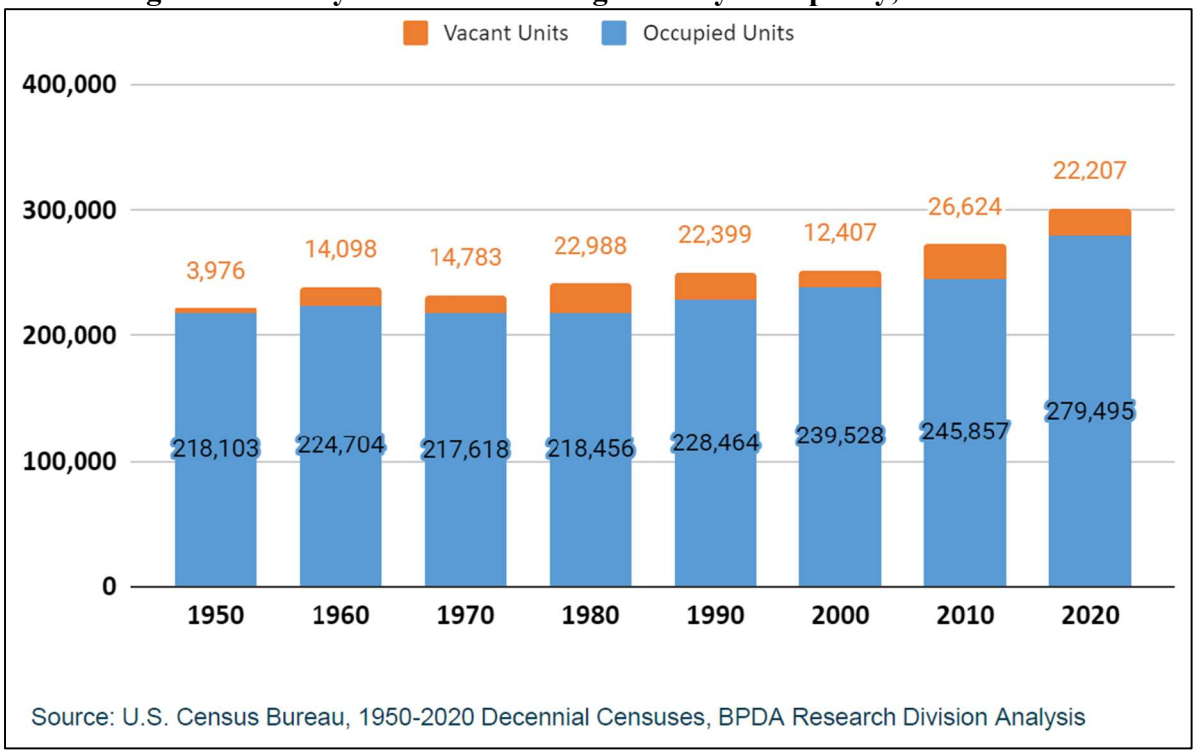
6.0 HOUSING CONDITIONS AND TRENDS

This section summarizes Boston's current housing market conditions and trends, with an emphasis on changes between 2010 and 2020.

Housing Units and Vacancy Rate

Data in **Figure 2-33** show the number of occupied and vacant housing units in Boston. Boston had 302,000 housing units in 2020, an increase of 10.7% from 2010.

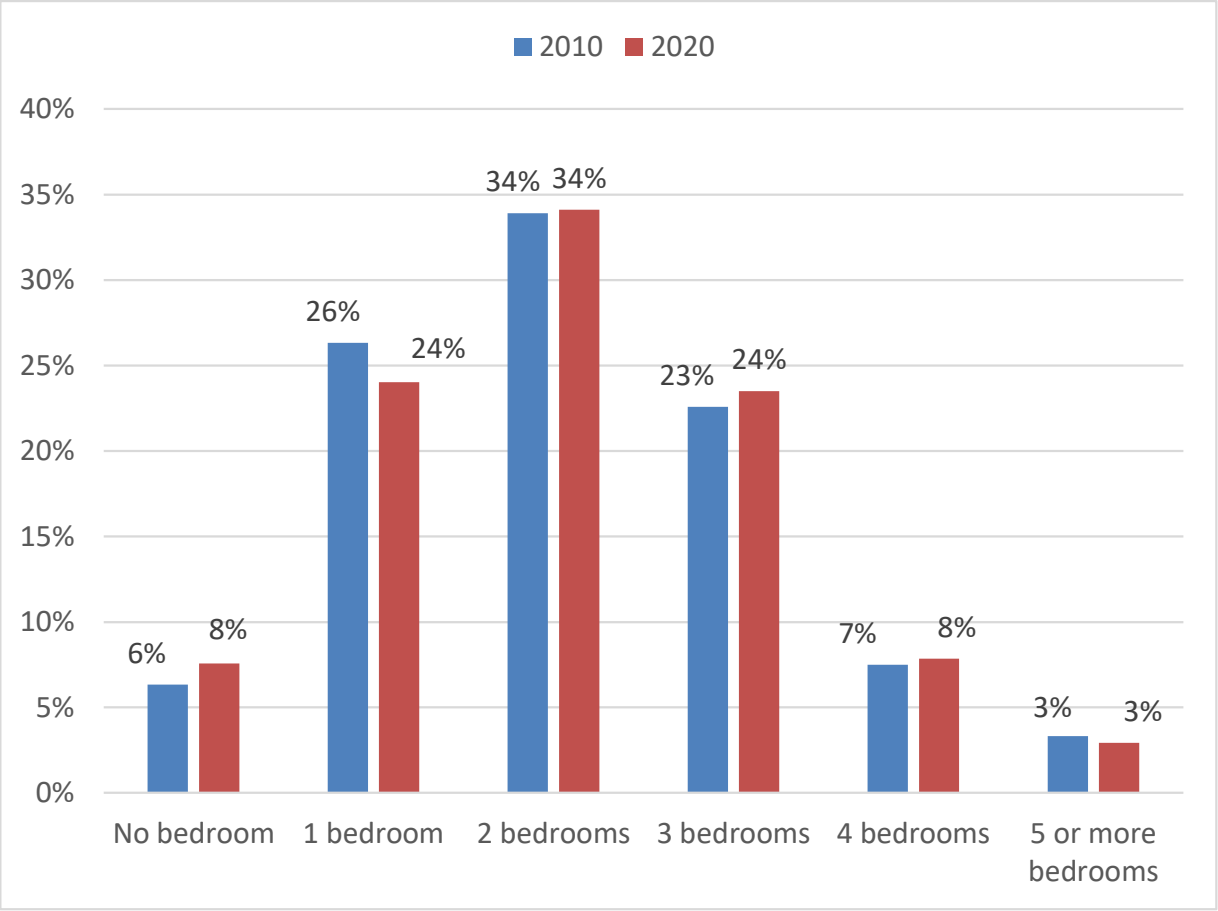
Figure 2-33. City of Boston Housing Units by Occupancy, 1950 to 2020



Unit Size

From 2010 to 2020, the number of bedrooms per housing unit stayed relatively the same, with a slight decrease in the number of 1-bedroom units and a slight increase in the number of studio units, 3-bedroom units, and 4-bedroom units (shown in **Figure 2-34**). The most common size for housing units in Boston was 2-bedroom units in both 2010 and 2020.

Figure 2-34. City of Boston Number of Bedrooms per Housing Unit, 2010 and 2020

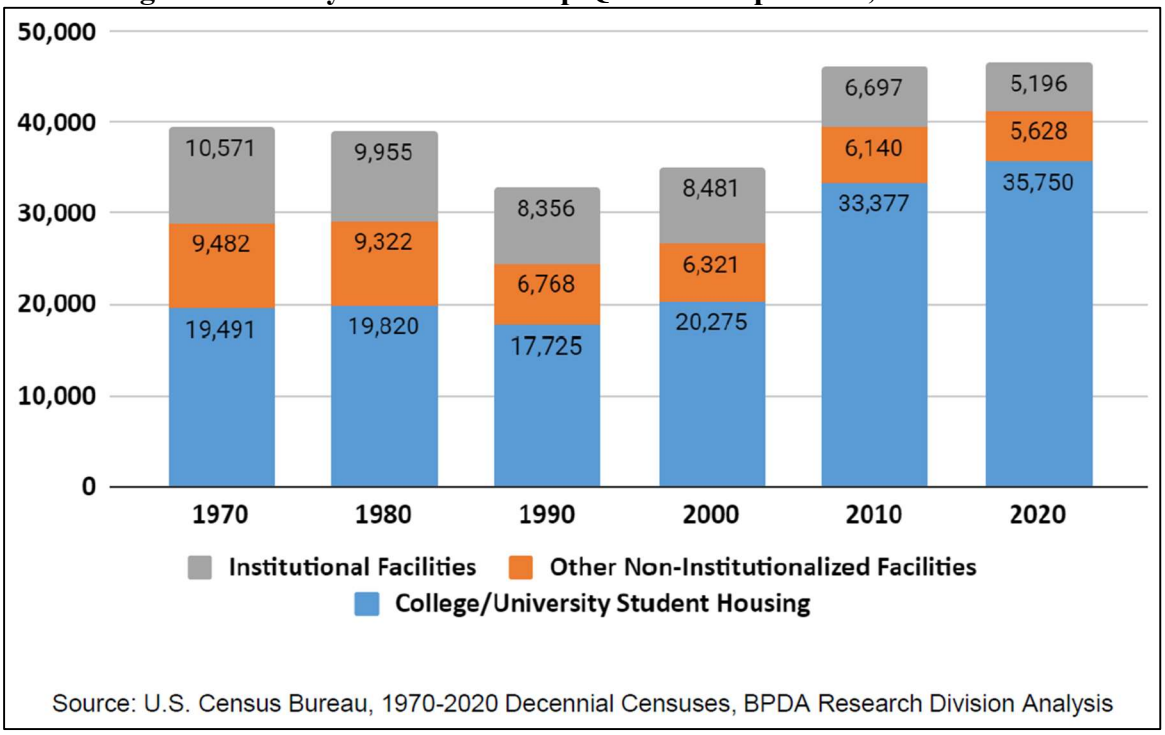


Source: U.S. Census Bureau, 2016 – 2020 and 2006 – 2010 5-Year American Community Survey; and ConsultEcon Inc.

Group Quarters

In 2020, about 36,000 residents lived in college or university student housing in Boston, up about 7% from 2010, shown in **Figure 2-35**. Institutional facilities include correctional facilities, nursing homes, and psychiatric hospitals and non-institutionalized group quarters include college dorms, military barracks, and worker housing.

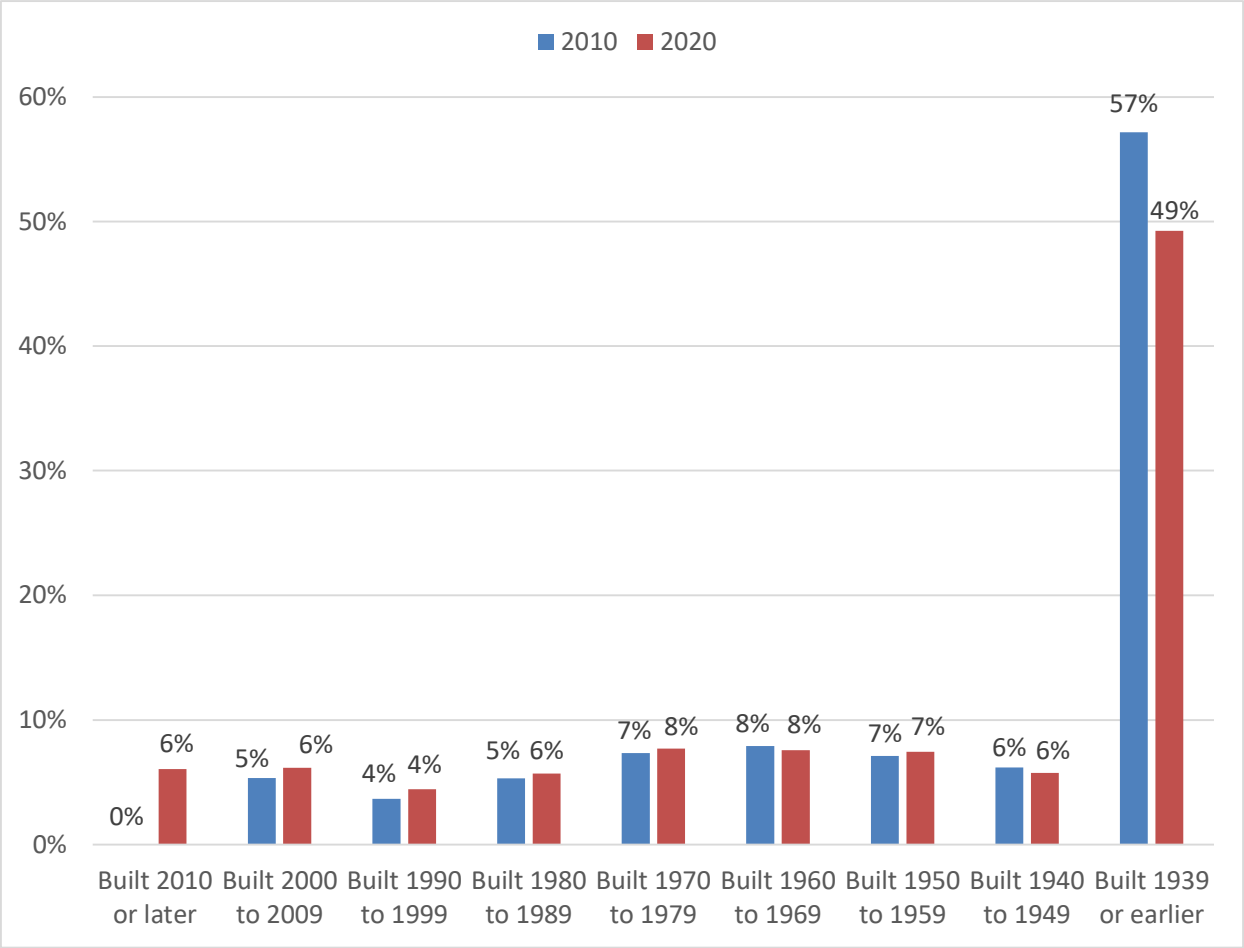
Figure 2-35. City of Boston Group Quarters Population, 1970 to 2020



Age of Housing Units

Figure 2-36 shows the age of housing units in Boston in 2010 and 2020. While nearly 60% of units in 2010 were built in 1939 or earlier, only about 50% of units in 2020 were that old. About 6% of housing units in 2020 had been built in 2010 or later.

Figure 2-36. City of Boston Age of Housing Units, 2010 and 2020

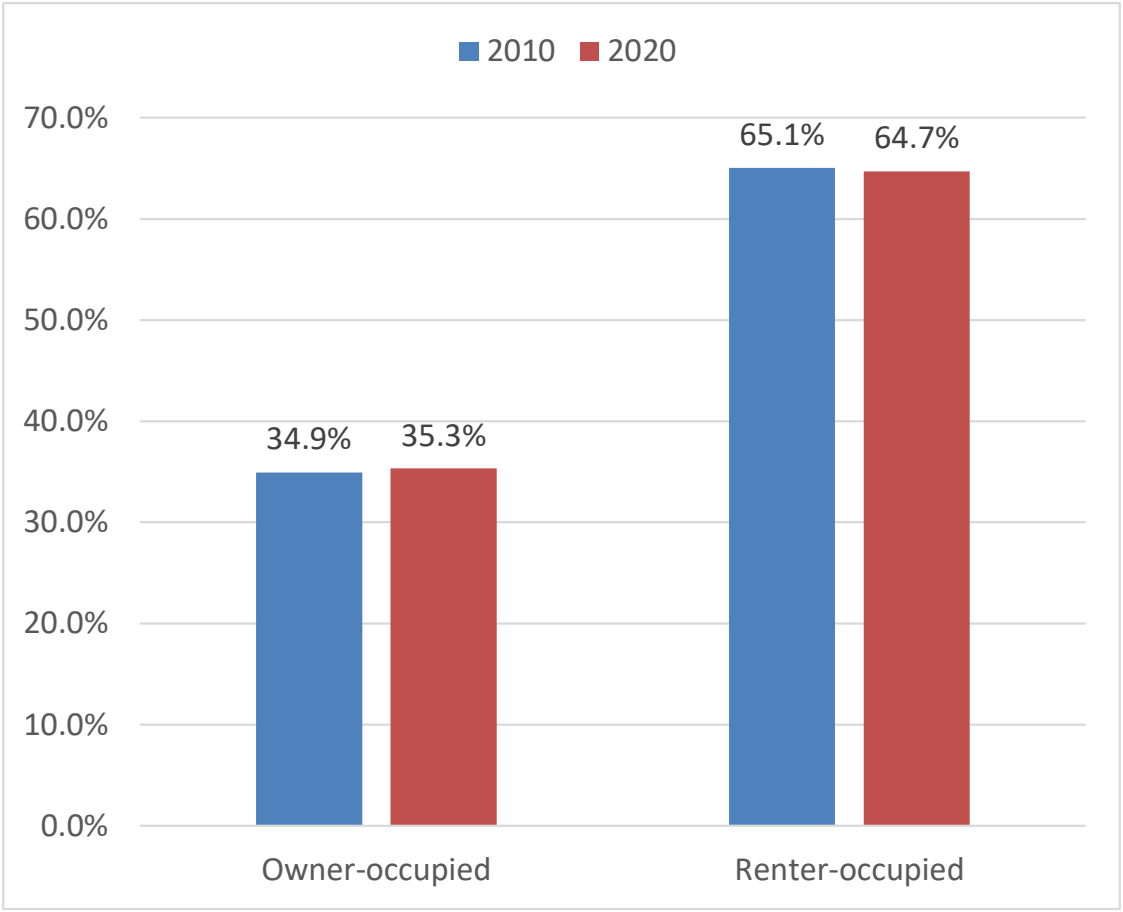


Source: U.S. Census Bureau, 2016 – 2020 and 2006 – 2010 5-Year American Community Survey; and ConsultEcon Inc.

Tenure of Housing Units

The share of housing units occupied by owners and renters in Boston stayed about the same from 2010 to 2020, as shown in **Figure 2-37** About two-thirds of housing units were occupied by renters.

Figure 2-37. City of Boston Owner-Occupied and Renter-Occupied Housing Units, 2010 and 2020



Source: U.S. Census Bureau, 2016 – 2020 and 2006 – 2010 5-Year American Community Survey; and ConsultEcon Inc.

Gross Rents

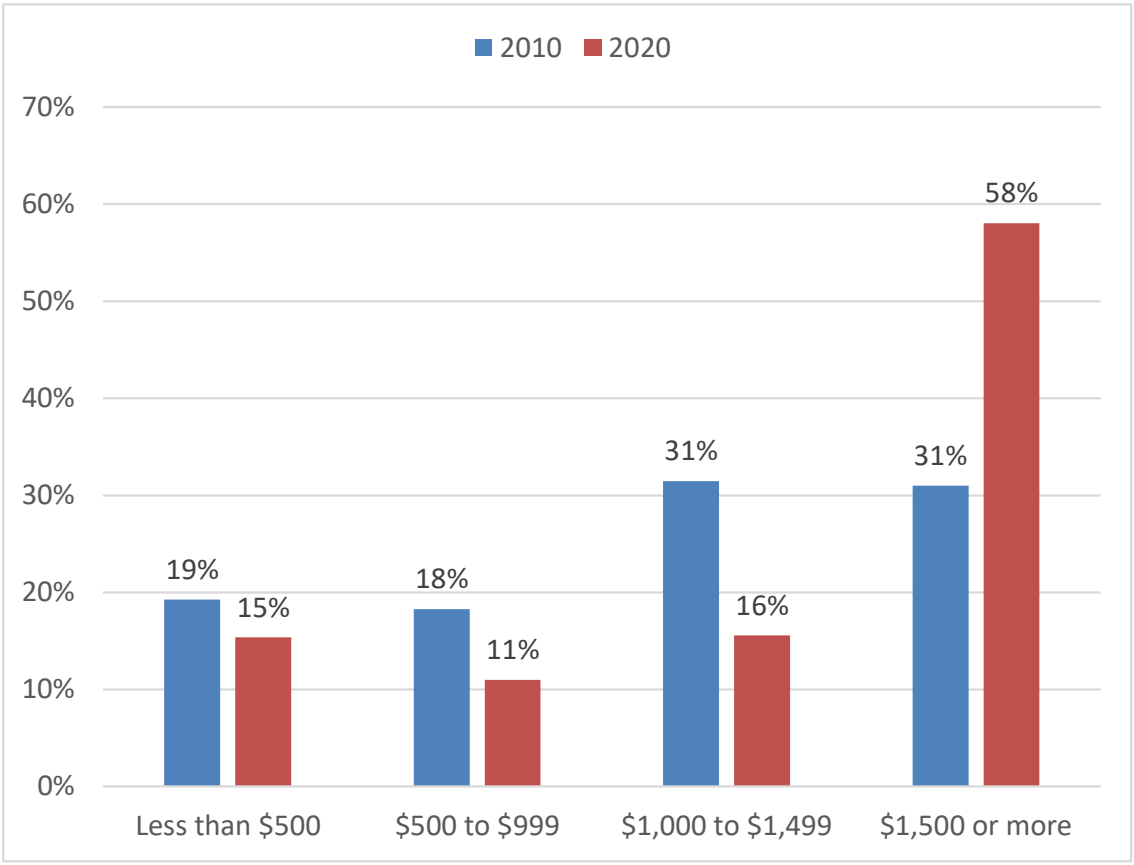
The median rent in 2020 was $1,685, an increase of about 41% and nearly $500 from $1,199 in 2010. Data in **Figure 2-38** shows the gross rents for renter-occupied housing units in Boston in 2020 and **Figure 2-39** shows the gross rents for renter-occupied housing units in 2010 and 2020. The number of housing units with rent costing $1,500 per month or more nearly doubled from 31% in 2010 to about 58% in 2020.

Figure 2-38. City of Boston Gross Rents for Renter-Occupied Housing Units, 2020

Gross Rents	Housing Units	Percent to Total
Less than $500	26,641	15%
$500 to $999	19,076	11%
$1,000 to $1,499	26,991	16%
$1,500 to $1,999	37,616	22%
$2,000 to $2,499	28,661	17%
$2,500 to $2,999	15,679	9%
$3,000 or more	18,615	11%
Occupied units paying rent	**173,279**	**100%**
No rent paid	3,407	
Median (dollars)	**$1,685**	

Source: U.S. Census Bureau, 2016 – 2020 and 2006 – 2010 5-Year American Community Survey; and ConsultEcon Inc.

Figure 2-39. City of Boston Gross Rents by Rent Amount for Renter-Occupied Housing Units, 2010 and 2020

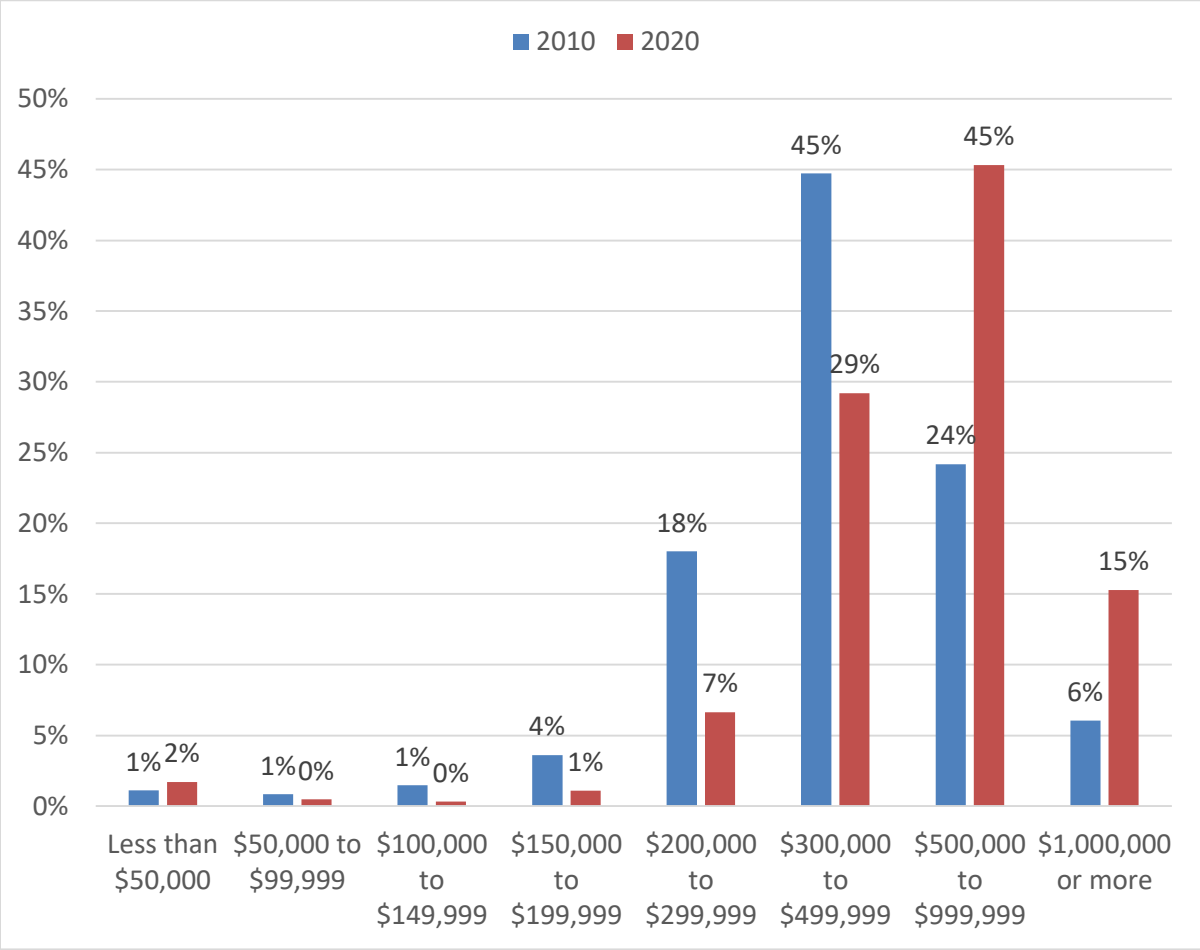


Source: U.S. Census Bureau, 2016 – 2020 and 2006 – 2010 5-Year American Community Survey; and ConsultEcon Inc.

Housing Values

The median home value[21] for owner-occupied units was $581,200 in 2020, an increase of nearly 50% from $395,200 in 2010. **Figure 2-40** shows the home values for owner-occupied housing units in Boston in 2010 and 2020. The largest percentage of housing units in 2010 had a home value between $300,000 and $499,999 (about 45%) and in 2020 the largest percentage had a home value from $500,000 to $999,999 (about 45%). The percentage of housing units worth more than $1,000,000 grew from 6% to 15% during the 10 year period.

Figure 2-41. City of Boston Home Values for Owner-Occupied Housing Units, 2010 and 2020



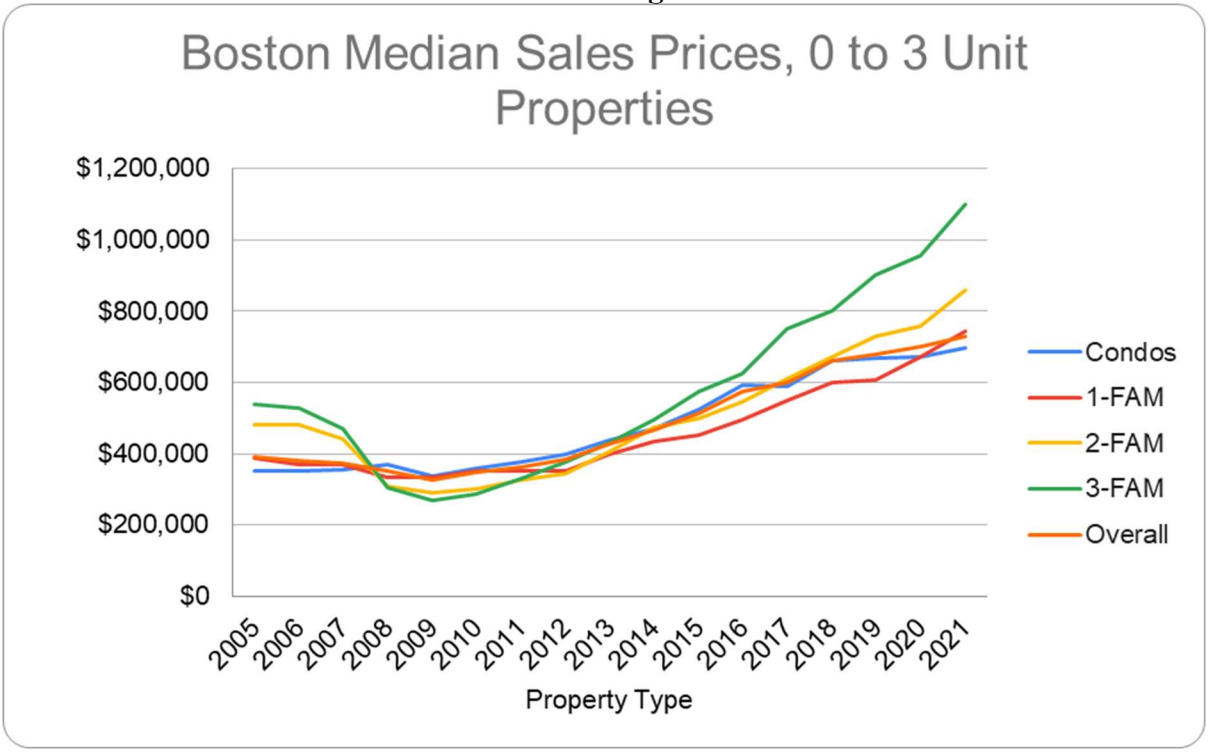
Source: U.S. Census Bureau, 2016 – 2020 and 2006 – 2010 5-Year American Community Survey; and ConsultEcon Inc.

[21] The definition of home value from the U.S. Census Bureau is as follows – Value is the respondent's estimate of how much the property (house and lot) would sell for if it was for sale. Data includes only specified owner-occupied housing units – single family houses on less than 10 acres without a business or medical office on the property.

Housing Sales

In 2020 and 2021, the city averaged 7,700 condo, single family, 2 family and 3 family houses. Data in **Figure 2-42** shows trends in housing prices for these property types. Prices are the highest they've ever been for each type of property. The median sales price increased 4 percent between 2020 to 2021 from $700,000 to $730,000. A household would need more than $150,000 in annual income in order to afford a house at these median sales prices.

Figure 2-42. City of Boston Single Family, Two and Three Family and Condominium Sales, 2005 through 2021



Source: City of Boston.

Trends in Housing Inventory

Boston had 301,702 total housing units in 2020, an increase of 10.7% from 2010. According to the U.S. Census Bureau, 7.4% of Boston housing units were vacant in April 2020. Of the occupied units, 68% were occupied by homeowners and 32% were occupied by renters.

Affordable Housing Stock

As shown in **Figure 2-43,** nearly 1 in 5 housing units in the city 20% of 56,695 are income-restricted, affordable housing in five units. 95% of these units are rental units. As shown in **Figure 2-45,** in the past 10 years, Boston has permitted 8,420 income-restricted units, which is 28% of total housing production during that time. In 2021, 36% of all housing production was income restricted (767 units). The vast majority (85%) of income-restricted units are for low-income households with less than 60% of Area Median Income (AMI) with 27% for extremely low-income households below 30% AMI ((see Figure 6-10).

Figure 2-43. Income-Restricted Units as a Percentage of Total Housing Stock City of Boston

	ALL UNITS	RENTAL	OWNER
Total Housing Units in Boston[1]	296,035	198,189	97,846
Total Income-Restricted Units	56,695	53,898	2,797
% Income-Restricted	19.2%	27%	3%

1/ 2010 Decennial Census (includes all occupied housing units, rented/sold not occupied, and vacant for rent/sale) + permitting data (units completed between 2011-2020).
Source: City of Boston Department of Neighborhood Development.

Figure 2-44. Income-Restricted Units by Income Restriction, City of Boston

INCOME LEVEL (PERCENT OF AMI)	UNITS	PERCENT OF TOTAL
<30%	15,483	27%
31-50%	21,065	37%
51-60%	11,908	21%
61-80%	5,736	10%
81-120%	1,745	3%
>120%	143	0.3%
Unknown	615	1%
TOTAL*	**56,695**	**100%**

*Percentages add up to slightly over 100% due to rounding
Source: City of Boston Department of Neighborhood Development

Housing Permit Trend

Over the last 10 years, 39,000 new housing units were permitted in the city of Boston, 21% of which were income restricted as shown in **Figure 2-45.**

Figure 2-45. Total Permitted and Income-Restricted Units, 2011 to 2021, City of Boston

YEAR	TOTAL PERMITTED UNITS	INCOME-RESTRICTED PERMITS	PERCENT INCOME-RESTRICTED
2011	2,059	462	22%
2012	2,428	368	15%
2013	3,328	728	22%
2014	4,070	658	16%
2015	4,539	964	21%
2016	2,833	535	19%
2017	6,051	1,047	17%
2018	4,201	726	17%
2019	3,161	829	26%
2020	3,252	1,023	31%
2021	3,404	1,080	32%
TOTAL 2011-2021	**39,326**	**8,420**	**21%**

Source: City of Boston Department of Neighborhood Development

Affordable Housing Production

There were over 7,200 new affordable housing units produced in the city between 1989 and 2022, as shown in **Figure 2-46**. Eighty-six percent of these units were rental units and 14% ownership units. Over the same period, 770 units of market rate housing were converted to affordable housing and 5,800 affordable rental units were preserved. About 59% of the new housing produced was targeted to moderate-income households and 34% to low-income households, with the remaining 7% to middle income households.[22] Most housing units produced and in the pipeline, have been 1- and 2-bedroom units, with fewer studios and 3+ bedrooms.

For projects that are under construction or awarded funding, a greater proportion of rental units are targeted to low-income households than was targeted in projects completed from 1989 to April 2022.

Figure 2-46. Selected Characteristics of Completed and Future Affordable Housing Projects, City of Boston, 1989 through April 2022

	Completed, 1989 to 2022	Percent to Total	In construction or DND/ Awarded/ Ready to Issue	Percent to Total
New Affordable Units by Tenure				
Afford New Owner Units	1,007	13.9%	77	3.9%
Afford New Rental Units	6,222	86.1%	1,857	95.0%
Afford New Units	**7,229**	**100.0%**	**1,954**	**100.0%**
New Affordable Units by Income Group				
Below 50% AMI	2,497	34.5%	838	42.9%
50-80% AMI	4,260	58.9%	980	50.2%
80-120% AMI	472	6.5%	136	7.0%
Total	**7,229**	**100.0%**	**1,954**	**100.0%**
New Affordable Units by Unit Size (not available for all projects)				
0BR	774	13.2%	302	16.6%
1BR	1,770	30.1%	548	30.2%
2BR	2,490	42.4%	771	42.5%
3+BR	840	14.3%	195	10.7%
Total	**5,874**	**100.0%**	**1,816**	**100.0%**

Source: City of Boston, Department of Neighborhood Development, and ConsultEcon, Inc.

[22] Low-income group is households earning less than 50% of area median income, moderate-income group is household earning between 50% and 80% of AMI and middle income group is households earning 80% to 120% of AMI.

Multi-Family Property Vacancy Rates
There was a total of 102,000 multi-family inventory units in 2,900 buildings in Boston in 2022, representing about 2.2% growth in units from the prior year[23]. About 3,400 of those units were vacant in 2022, a decrease of nearly 40% from 2021. Vacancy peaked in 2020 during the global pandemic. The vacancy rate in 2022 was 3.4%, compared to 5.4% in 2021.

Multi-Family Property Market Rents per Unit
The weighted average market rent per unit for multi-family properties in Boston in 2022 was about $2,800 per month, a 9% increase from 2021[24]. Rents had been increasing steadily up to 2020, when rent prices dipped slightly during the global pandemic. Rent prices across the city increased about $200 per unit from 2021 to 2022, and are projected to continue rising at a steeper rate than prior to the pandemic.

Housing Cost-Burdened Households
Data in **Figure 2-47** show the extent of housing cost burden, measured as housing costs as a percentage of household income, for Boston owner- and renter-households in 2020. Households with housing costs above 30% of income are considered housing-cost burdened and those with housing costs above 50% of income are considered to have a severe housing cost burden[25]. Among all households, 42% are housing cost-burdened and 24% are severely cost-burdened. There are more renter households in the city and 50% of them are cost burdened while 28% of owner households are cost burdened.

Based on Census data, 19% of owner households without a mortgage, 32% of owner households with a mortgage, and 49% of renter households pay more than 30% of their income on housing costs.

Figure 2-47. Housing Cost Burden for Owner and Renter Households, 2016 to 2020, City of Boston

	Total Households	Paying 30-49% of income on housing	Paying 50%+ of income on housing	Total Cost Burdened	Total Cost Burden as a Percent of Tenure	Total Cost Burden as a Percent of Total Burdened	Total Severely Burdened as a Percent of Tenure
Renter Households	177,652	36,361	52,820	89,181	50%	77%	30%
Homeowners	95,536	13,785	12,974	26,759	28%	23%	14%
Total Households	273,188	50,146	65,794	115,940	42%	100%	24%
Source: 2016-2020 American Community Survey, PUMS Data; MOH analysis							

[23] CoStar Realty Information Inc., City of Boston, and ConsultEcon, Inc.
[24] CoStar Realty Information Inc., City of Boston, and ConsultEcon, Inc.
[25] https://www.huduser.gov/portal/pdredge/pdr_edge_featd_article_092214.html.

Housing Cost-Burdened Households by Race/Hispanic

Black and Hispanic or Latino households in Boston are more likely than white renters to be severely costs burdened, as shown by data in the **Figure 2-48** for renter households and **Figure 2-49** for renter households.

Figure 2-48. Housing Cost Burden for Renter Households, by Race/Ethnicity, 2016 to 2020, City of Boston

Race/Ethnicity	Total Renters	Paying 30-49% of income on housing	Paying 50%+ of income on housing	Total Cost Burdened	Percent of Race/Ethnicity Paying 30-49% of Income on Housing	Percent of Race/Ethnicity Paying 50%+ of Income on Housing	Percent of Race/Ethnicity who are Cost Burdened	Race/Ethnicity as Percent of All Renter Households	Race/Ethnicity as Percent of All Those Paying 30-49% of Income on Housing	Race/Ethnicity as Percent of All Those Paying 50%+ of Income on Housing	Race/Ethnicity as Percent of All Those Housing Cost Burdened
Other, non-Latinx	1,259	217	525	742	17.2%	41.7%	59%	0.7%	0.6%	1.0%	0.8%
Hispanic/Latinx	39,086	9,246	13,234	22,480	23.7%	33.9%	58%	22.0%	25.4%	25.1%	25.2%
Black, non-Latinx	36,515	8,219	13,257	21,476	22.5%	36.3%	59%	20.6%	22.6%	25.1%	24.1%
Asian/Pacific Islander, non-Latinx	18,153	3,881	6,701	10,582	21.4%	36.9%	58%	10.2%	10.7%	12.7%	11.9%
Two or More Race, non-Latinx	4,074	644	1,463	2,107	15.8%	35.9%	52%	2.3%	1.8%	2.8%	2.4%
White, non-Latinx	78,206	14,084	17,459	31,543	18.0%	22.3%	40%	44.0%	38.7%	33.1%	35.4%
Native American, non-Latinx	359	70	181	251	19.5%	50.4%	70%	0.2%	0.2%	0.3%	0.3%
All BIPOC Categories	99,446	22,277	35,361	57,638	22.4%	35.6%	58%				
Total	177,652	36,361	52,820	89,181	20.5%	29.7%	50%	100.0%	100.0%	100.0%	100.0%

Source: 2016-2020 American Community Survey, PUMS Data; MOH analysis

Figure 2-49. Housing Cost Burden for Homeowners, by Race/Ethnicity, 2016 to 2020, City of Boston

Race/Ethnicity	Total Owners	Paying 30-49% of income on housing	Paying 50%+ of income on housing	Total Cost Burdened	Percent of Race/Ethnicity Paying 30-49% of Income on Housing	Percent of Race/Ethnicity Paying 50%+ of Income on Housing	Percent of Race/Ethnicity who are Cost Burdened	Race/Ethnicity as Percent of All Homeowner Households	Race/Ethnicity as Percent of All Those Paying 30-49% of Income on Housing	Race/Ethnicity as Percent of All Those Paying 50%+ of Income on Housing	Race/Ethnicity as Percent of All Those Housing Cost Burdened
Other, non-Latinx	599	149	184	333	25%	31%	56%	1%	1%	1%	1%
Hispanic/Latinx	7,588	1,656	1,398	3,054	22%	18%	40%	8%	12%	11%	11%
Black, non-Latinx	17,855	3,247	3,926	7,173	18%	22%	40%	19%	24%	30%	27%
Asian/Pacific Islander, non-Latinx	7,566	963	1,053	2,016	13%	14%	27%	8%	7%	8%	8%
Two or More Race, non-Latinx	2,024	434	150	584	21%	7%	29%	2%	3%	1%	2%
White, non-Latinx	59,769	7,336	6,263	13,599	12%	10%	23%	63%	53%	48%	51%
Native American, non-Latinx	135	0	0	0	0%	0%	0%	0%	0%	0%	0%
Total	95,536	13,785	12,974	26,759	14%	14%	28%	100%	100%	100%	100%

Source: 2016-2020 American Community Survey, PUMS Data; MOH analysis

Summary

Due to the high cost of both rental and ownership housing, a large share of households are spending more than 30 percent of their income on housing costs. This cost burden can be alleviated by providing more housing that is affordable to low-, moderate- and middle-income households. The employment in the region is driven by in new non-residential development. This employment opportunity attracts people from inside and outside of the region, some of whom will look for and perhaps purchase or rent housing in Boston because of the convenience that job proximity offers. Some of those jobs are for low-, moderate- and middle-income households, which will create new

demand from households in these groups. This is problematic because there is already a shortage of affordable housing for these groups and this demand exacerbates the shortage. Therefore, policies like the linkage policy can mitigate the impact of this new affordable housing demand.

7.0 Local and National Trends

Several trends have the potential to influence Boston's economic development and housing market conditions over the next decade. This section highlights key trends and discusses their potential impact.

Increase in remote and hybrid work arrangements. The pandemic resulted in the widespread use of remote work along with hybrid arrangements in which workers split their time between the employer's office and remote work. The extent to which these alternative work arrangements will become permanent is uncertain but it is expected that both remote and hybrid work will grow, in part due to the employee's desire for these arrangements and the need of employers to accommodate these preferences to attract and retain workers. Significant growth in remote and hybrid work may impact Boston in several ways:

- Reducing the amount of space that employers need to occupy, lowering the demand for office space, reducing its net absorption and the amount of future development that occurs[26].
- Lowering daily occupancy of space by employees with a resulting decrease in retail, food, and service spending among office workers. This reduced spending may reduce occupancy and employment among restaurants, bars, stores and service businesses that are highly dependent on worker spending.
- Lowering demand for housing in Boston due to a remote work option among Boston employers, which may reduce these workers' desire to live in Boston and seek housing in the city, especially given the availability of lower-cost housing options in the Boston region and even outside the region. Reduced housing demand could slow the growth in housing costs if housing supply continues to grow. It might also slow the development of new housing, especially if developers believe that remote work will reduce demand and the rents and sales prices that they will obtain.
- Increasing the importance of access to computers, high-speed internet access and computer literacy for accessing jobs and education and training services, many of which shifted to on-line delivery during the pandemic.[27] This disproportionately impacts low-income workers and neighborhoods which lack resources to acquire computers and afford high speed internet services.

[26] McKinsey & Company, Preparing for the Future of Work in the Commonwealth of Massachusetts.
[27] Will Dorsey Eden, Joseph Fuller, and Rachel Lipson, The Future of Boston's Workforce: The path forward from COVID-19, The Project on Workforce at Harvard and The Boston Foundation, 2021.

Inflation, Federal Reserve Policy and Interest Rates. The current high rate of inflation and the Federal Reserve Bank's response in raising interest rates will affect the national and local economy with multiple potential impacts:

- Higher interest rates will slow economic growth as the cost of investment and large consumer purchases grows, and will increase the risk of an economic recession. Slower economic and employment growth will reduce demand for new office and other non-residential space and likely increase real estate vacancies. These weakened market conditions may cause developers to delay or abandon some development projects.
- Higher interest rates also will increase the cost of capital, which may make some planned projects infeasible for investment and delay and/or lower non-residential and residential development activity.
- Higher interest rates will increase the cost of buying and owning housing, making home ownership less affordable for more Boston residents.

Stock market decline and the bear market for tech stocks. Boston's innovation and technology economy depends on a steady flow of venture capital and initial public stock offerings that finance the start-up and growth of new and early stage ventures, particularly in the Life Science and Information Technology-related industries. The bear market in tech stocks will reduce the supply of venture capital, shift investment away from tech sectors with poor stock market returns and make it more difficult for growing firms to raise capital on the stock market.[28] This reduced supply of capital will reduce demand for lab and office space in Boston, as fewer start-ups will get launched and existing firms shrink or slow expansion to conserve their capital until the financing environment improves. There is already evidence that tech companies are freezing or slowing employment growth in part due to preserve capital.[29]

Growing Racial Income and Wealth Inequality. The long-standing and growing racial disparities in income and wealth is both a national and local trend that impacts Boston's economy and housing market in many ways. Several examples are:

- Slower economic growth: a recent report estimated that racial gaps in wages and employment within the Boston regional economy resulted in almost $45 billion in lost economic activity in 2018 and that equal wages for Black and Latino worker would have added 10% to the region's GDP[30].
- Increasing income inequality and the high cost of housing in Boston may push more low- and moderate-income residents and people of color to move out of Boston, adding an additional barrier to accessing jobs in the city[31].

[28] Pitchbook, Analysts Advise on Key Trends to Watch as Markets Return to Turmoil, May 17, 2022.
[29] Aaron Pressman, "This one is different': Tech companies brace for impact amid market plunge," *Boston Globe, May 26, 2022.*
[30] Abbie Langston, Justin Scoggins, Matthew Walsh. *Advancing Workforce Equity In Boston: A Blueprint For Action, National Equity Atlas*, 2021.
[31] Tracie Neuhaus, Kaitlin Terry Canver, & Heena Khoja. Catapult Forward: Accelerating A Next-Generation Workforce Ecosystem In Greater Boston, Boston Foundation, 2019.

- Reduced access to home ownership for Black, Latino and other people of color due to the lack of savings needed for home purchase down-payments and insufficient incomes to obtain a home purchase mortgage.
- Higher barriers to stable employment and good quality jobs for Black, Latino and minority workers due to greater economic insecurity and a lack of financial resources needed for higher education, transportation, child care, technology and other "social determinants" of employment[32].

Tight Labor Market Conditions and Automation. The decline in labor force participation post - pandemic, combined with low unemployment rates and recent strong economic growth has created a tight labor market in which it is difficult to find and hire workers, with several potential impacts:

- Economic and employment growth may slow if firms and institutions are unable to attract the number and type of workers needed to respond to market demand and undertake growth plans.
- Employers are likely to speed adoption of automation to save costs and address the challenges of recruiting workers in a very tight labor market. This trend may reduce the level of employment growth that results from new development in some industries and disproportionately impact Black, Latino, and Native American workers who are overrepresented in the transportation and accommodation and food services sectors, which are facing a higher risk of automation[33].
- Increased employer interest in working with the workforce development system to train, hire workers and alter hiring practices and bias that have historically created barriers to employment and better quality jobs for immigrants, non-white workers and those without a college education.

Conclusion

Boston has a strong and diversified economy that will continue to grow in the next decade, generating significant new non-residential development and employment growth. This development and job growth will generate the need for affordable housing to accommodate new workers. It will also create opportunities to expand stable employment and earnings for Boston residents, particularly unemployed and low-income workers, and to reduce current racial disparities in income and employment in higher paying occupations.

The following sections of the report provide more detailed analysis to estimate the projected impacts on future non-residential development on affordable housing and employment opportunities, the costs to mitigate these impacts and the linkage fees rates needed to fund these costs.

[32] Tracie Neuhaus, Kaitlin Terry Canver, & Heena Khoja. *Catapult Forward: Accelerating A Next-Generation Workforce Ecosystem In Greater Boston*, Boston Foundation, 2019.

[33] Abbie Langston, Justin Scoggins, Matthew Walsh. Advancing Workforce Equity In Boston: A Blueprint For Action, National Equity Atlas, 2021.

III. Boston Development Trends and Future Development

Boston's diverse and growing economy generated significant new development over the past decade. As noted in the prior section, it faces new challenges with the pandemic's impact on office occupancy, a growing risk of recession and financial market conditions. This section reviews recent development trends and market conditions that inform the scale of Development Impact Projects (DIP) subject to linkage fees and the industries that will occupy new DIP development over the next decade. It concludes with a ten-year forecast of future development and employment by use and industry that will be used to estimate impacts on demand for affordable housing and employment and training services for Boston residents.

Table 3-1. Gross Floor Area of DIP Projects by Use and Development Status, Completed January 2012 to April 2022 and Permitted as April 2022

Development Category	Construction Complete	Permitted / Under Construction	Board Approved	Grand Total
DIP Uses by Type	**Square Feet**			
Office	7,777,283	1,794,492	12,332,612	21,904,387
RnD	233,500	413,951	5,872,505	6,519,956
Institutional	1,515,982	1,390,000	3,586,418	6,492,400
Hotel	2,227,827	1,493,510	1,198,107	4,919,444
Retail	1,034,883	234,410	1,160,425	2,429,718
Total DIP Uses	**12,789,475**	**5,326,363**	**24,150,067**	**42,265,905**
DIP Uses by Type	**Percent of Total**			
Office	61%	34%	51%	52%
RnD	2%	8%	24%	15%
Institutional	12%	26%	15%	15%
Hotel	17%	28%	5%	12%
Retail	8%	4%	5%	6%
Total DIP Uses	**100%**	**100%**	**100%**	**100%**

Source: City of Boston, Karl F. Seidman Consulting Services, and ConsultEcon, Inc.

Over the past ten years, from 2012 to the first quarter of 2022, 12.8 million square feet (SF) of DIP projects were completed in Boston (see **Table 3-1**). Office and lab/research and development uses (R&D) accounted for 63% of the developed space with hotels generating 17% and institutional uses representing 12%. Boston's development pipeline in April 2022 was much larger with 5.3 million SF of DIP projects under construction and almost 24.2 million SF approved by the Boston Planning and Development Agency (BPDA) but not under construction. A larger share of DIP projects under construction are for hotel and institutional use, 26% and 28%, respectively, than for completed projects while the share for office/R&D use (42%) is lower. However, office/R&D uses dominate board approved projects at 75%, which reflects the plans by many developers to build new space for the region's growing life sciences sector. Hotel projects, on the

other hand, account for only 4% of board approved projects. Retail space is a relatively small share of SF, ranging from 8% in completed projects to 4% for those under construction.

Market Demand and Absorption

Although Boston's large DIP project pipeline suggests the potential for almost 30 million SF of new development in the next decade, actual development and its occupancy will depend on the absorption of newly developed space by new and expanding employers and the city's success in attracting business growth within the region. This section reviews historic trends in Boston's supply, vacancy and absorption of office and Lab space, and discusses recent development trends and the city's competitive position in the region, particularly in the fast-growing life science lab market.

Strong pre-pandemic growth in office space supply and healthy absorption have slowed while lab space development and absorption have increased. From 2012 through 2021, Boston added almost 6 million SF of office space and 2.5 million SF of lab space—averaging 571,114 SF and 252,282 SF annually, respectively (see **Table 3-2)**. Average annual absorption of space mirrored the supply increase during this period, at 590,190 for offices and 266,121 SF for labs. Moreover, in the decade before the pandemic , net absorption office space was even greater, averaging 943,600 SF per year-over five times absorption of lab space. However, this pattern has reversed in the last five years, as the pandemic reduced demand for office space and generated significant new vacancies. From 2017-2021, office space absorption was negative –reducing occupancy by 594,000 SF (an average of -118,839 SF per year) while net absorption of lab space averaged over 368,000 annually.

Table 3- 2. Boston Office and Lab Space Growth and Absorption, 2012 to 2021

Metric	Office	Lab
Increase in Supply , 2012 - 2021	5,952,845	2,514,827
Average Annual Supply Increase, 2012-2021	571,114	252,283
Average Annual Net Absorption , 2012-2021	590,190	266,121
Increase in Supply , 2017 - 2021	898,777	1,544,489
Average Annual Supply Increase, 2017-2021	233,269	308,898
Average Annual Net Absorption , 2017-2021	(118,839)	368,329
Average Annual Supply Increase, 2010-2019*	699,121	184,826
Average Annual Net Absorption , 2010-2019*	943,600	171,888

Source: Colliers International and Karl F. Seidman Consulting Services *Pre-pandemic period

Demand for lab space throughout the Boston region has been very strong over the past several years, fueling rapid growth in the life science sector and medical research and development. **Table 3-3** summarizes the absorption of lab space from 2019 through the first quarter of 2022 in the Boston region. Annual net absorption more than tripled from almost 611,000 SF in 2019 to over 2 million SF in 2021, and averaged almost 1.3 million SF for the three years. The majority (57%) of absorbed space occurred in the suburbs, with Boston accounting for 24% of total net absorption. Boston's share increased over the period from 29% in 2019 to 38% for the first quarter of 2022.

Table 3- 3. Net Absorption of Lab Space, Boston Region and Sub-markets, 2019 to Q1, 2022

Year	Total	Boston	Cambridge	Suburbs	Boston %
2019	610,972	178,433	222,184	210,355	29%
2020	1,242,691	98,762	384,183	759,746	8%
2021	2,037,676	609,966	316,011	1,111,699	30%
2022 , Q1	459,500	176,000	-103,728	387,228	38%
Total	4,350,839	1,063,161	818,650	2,469,028	24%
Average, 3 years	1,297,113	295,720	307,459	693,933	23%

Source: Colliers International and Karl F. Seidman Consulting Services

Strong market demand for lab space and the associated increase in rents[34] has resulted in developers in Boston and throughout the region planning new lab development projects, including converting existing office buildings to lab use and converting projects originally planned for office development into planned lab buildings. Consequently, there is an extremely large pipeline of planned lab space in Boston, Cambridge and throughout the region that could lead to an oversupply of lab space in the next three to four years. According to a recent report by real estate brokerage firm Newmark[35], there is a potential pipeline of over 49 million SF of new lab development in the Boston region, with 14.5 million SF under construction and another 34.6 million in proposed projects. This pipeline is approaching twice the size of the region's 26.8 million SF of existing lab space. While Kendall Square and East Cambridge historically have been the center and most desirable location of life science firms, the Seaport District has emerged as a key alternative and lower cost location. In addition to the Seaport, lab projects are under construction and/or being planned for several other Boston neighborhoods, including Allston, Dorchester, Fenway, Longwood, Roxbury, and Suffolk Downs. Lab development in Boston, however, will face new competition, beyond Cambridge, in the next decade from expanding inner suburban lab districts, including Watertown, with an existing supply of 1.1 million SF and another 2 million SF under construction, and Somerville, which has almost 1.8 million SF under construction in Assembly Square and Union Square/Boynton Yards.

The large regional pipeline of lab projects creates the potential for an oversupply of lab space with growing amounts of vacant space and lower rents. If such an oversupply materializes, some Boston lab projects with board approval and in planning stages may not get built or may get delayed for many years. Thus, actual lab development in Boston over the next decade is likely to be less than the large scale of planned projects.

Interviews with developers and real estate professionals indicated considerable optimism about the outlook for Boston's economic growth and development. The combination of a diversified economy, strong growth among life science firms and Boston's advantages with a robust transportation network, strong workforce and urban amenities is expected to continue to generate demand for new lab and office development. Although overall office space demand and absorption

[34] Asking rents were $111.98/SF in East Cambridge and $110.10 in Boston during the first quarter of 2022, according to the Lincoln Property Company's *Lab Market Report*

[35] Newmark, *2021 Year End Life Science Overview and Market Clusters*

has declined, brokers and developers report strong demand for new high quality space, which companies view as a magnet for attracting talent and bringing workers back to the office. A combination of existing Boston tenants and firms moving to Boston from the suburbs (including consolidating multiple locations into a new Boston office) is driving demand for new office space. Nonetheless, future office demand is expected to fall below pre-pandemic levels and vacancies in existing older Class A and Class B buildings are likely to increase. Opinions on the outlook for life science lab development were mixed: some developers reported a slowdown in lab demand during 2022 while others see the market remaining strong, in part due to continued growth and acquisitions among large pharmaceutical companies.

Future Development and Employment Projection

Based on its market position, pipeline of projects under construction, and absorption and new development in recent years, **Boston is projected to absorb and spur new development of 14.861 million SF in office, laboratory, institutional (hospital and college/university) and ground retail/restaurants/service space over the next ten years.** The components of this projection by use (see **Table 3-4**) and key assumption used for the projections are:

- **Office:** 5.67 million SF of new development based on annual absorption at 90% of the pre-Covid level with a 2-year reduction in absorption from an economic slowdown or recession. Net new Boston occupancy is expected to be 3.827 million SF due to an expected 10% vacancy rate and 75% of the occupancy from new or growing Boston tenants and the other 25% of occupied space from relocations of existing firms and jobs within Boston.
- **Lab/Life Science:** 3.51 million SF of new development based on Boston attracting 30% of average annual regional absorption from 2019 to 2021 and a 2-year slowdown. Net new occupancy of 3.37 million SF due to a 4% vacancy and 100% new Boston tenants.
- **Hotel:** 1.78 million SF assuming that new development occurs at 80% of the level for the past ten years due to current low level of hotel occupancy.
- **Retail/restaurants/ground floor services:** 918,000 SF of new development based on 10% of office and lab SF and net occupancy of 826,000 SF, assuming a 10% vacancy rate.
- **Institutional:** 2.983 million SF of new development, including 2.013 million by hospitals and 970,000 by colleges and universities, generated by projects that are currently approved and/or included in institutional master plans and deemed likely to be built based on input from BPDA and institution staff .

Table 3-4. Summary of Projected Boston Development and Occupancy by Use, 2022 to 2031

Use	Gross Developed SF	Newly Occupied SF
Lab	3,510,000	3,370,000
Office	5,670,000	3,826,000
Retail/Ground Floor	918,000	826,000
Hotel	1,780,000	1,780,000
Hospital	2,013,000	2,013,000
College/University	970,000	970,000
Total	14,861,000	12,785,000

Source: Karl F. Seidman Consulting Services

Expected Tenant Businesses

To determine the likely jobs and earnings from this new development, the industries likely to occupy the new large developments need to be projected. Since linkage fees are tied to **new development,** this type of new business and employment growth will differ from Boston's overall or net job growth, which reflects growth in existing businesses, loss of jobs from firms' contractions and relocations, and new businesses locating in smaller projects, under 100,000 SF.

As discussed in the macroeconomic analysis, Boston has a diverse economy with a large share of jobs in education and health care, professional and business services and financial services (see Figure 2-1 and Table 2-1 in Section II). Recent employment growth is a better indicator of the likely industry composition of new development than the overall employment base since growing industries are the likely source of new tenants. Table 2-2 listed 15 industries that added the most jobs between 2010 and the first half of 2021; together they added 94,365 jobs—above Boston's overall net job growth of 71,208 during this period. Health care and information technology were key drivers of growth over this period, accounting for eight of the 15 high growth industries and 65% of their new jobs. Four IT industries (Computer Systems Design, Electronic Shopping, Software, and Data Processing) combined to add 34,258 jobs and represented three of five industries with the highest absolute job growth. Three professional service industries (Management & Technical Consulting, Architecture & Engineering, and Accounting & Bookkeeping) were also important sources of growth, together adding 13,308 jobs. These high growth IT and professional service industries are projected to occupy new office development, along with one growing financial services industry. Scientific Research and Development Services—the largest component of Life Science industries—grew by 80% and added 6,103 jobs from 2010 to 2021 and is expected to occupy the new project lab development space.

The projections for businesses in new ground floor retail space reflect the mix of businesses in Boston's growing development districts, with 50% restaurants and the other 50% a mix of stores and services, including grocery stores, pharmacies, clothing and home furnishing stores, bank branches, day care and medical offices.

Table 3-5 summarizes the overall projected development by tenant industry and employment over the next ten years. These projections will be used to estimate occupations and wage levels for new employees working in the expected new buildings. Employment projections assume the amount of space occupied per new employee will be: 300 SF for office users; 450 SF for private and hospital life science occupants; 500 to 675 SF for retail, bank and day care tenants; 275 SF for medical offices; 120 SF for restaurants; 2,000 SF for hotels; 740 SF for colleges/universities; and 385 SF for hospital clinical space [36].

Table 3-5. Projected New Boston Development by Use and Tenant Type, 2022 to 2031

Industry	Square Feet	SF/Employee	Number of Employees
Scientific Research & Development /Life Science	3,370,000	450	7,489
Computer Systems Design	1,148,000	300	3,827
Electronic Shopping & Mail-Order Houses	574,000	300	1,913
Software	574,000	300	1,913
Management and Technical Consulting	383,000	300	1,277
Architectural and Engineering Services	287,000	300	957
Other Financial Investment Activities	287,000	300	957
Accounting and Bookkeeping Services	191,000	300	637
Data Processing, Hosting & Related Services	191,000	300	637
Management of Companies and Enterprises	191,000	300	637
Restaurant	413,000	120	3,442
Clothing Stores	41,000	675	61
Home furnishing stores	41,000	675	61
Grocery stores	83,000	500	166
Pharmacies	83,000	675	123
Daycare	41,000	500	82
Bank branches	41,000	500	82
Medical offices-Ambulatory HC services	83,000	275	302
Hotels	1,780,000	2,000	890
Colleges and Universities- Academic	970,000	740	1,311
Hospitals-Research	530,000	450	1,178
Hospitals- Clinical	1,483,000	385	3,852
Total	12,785,000		31,794

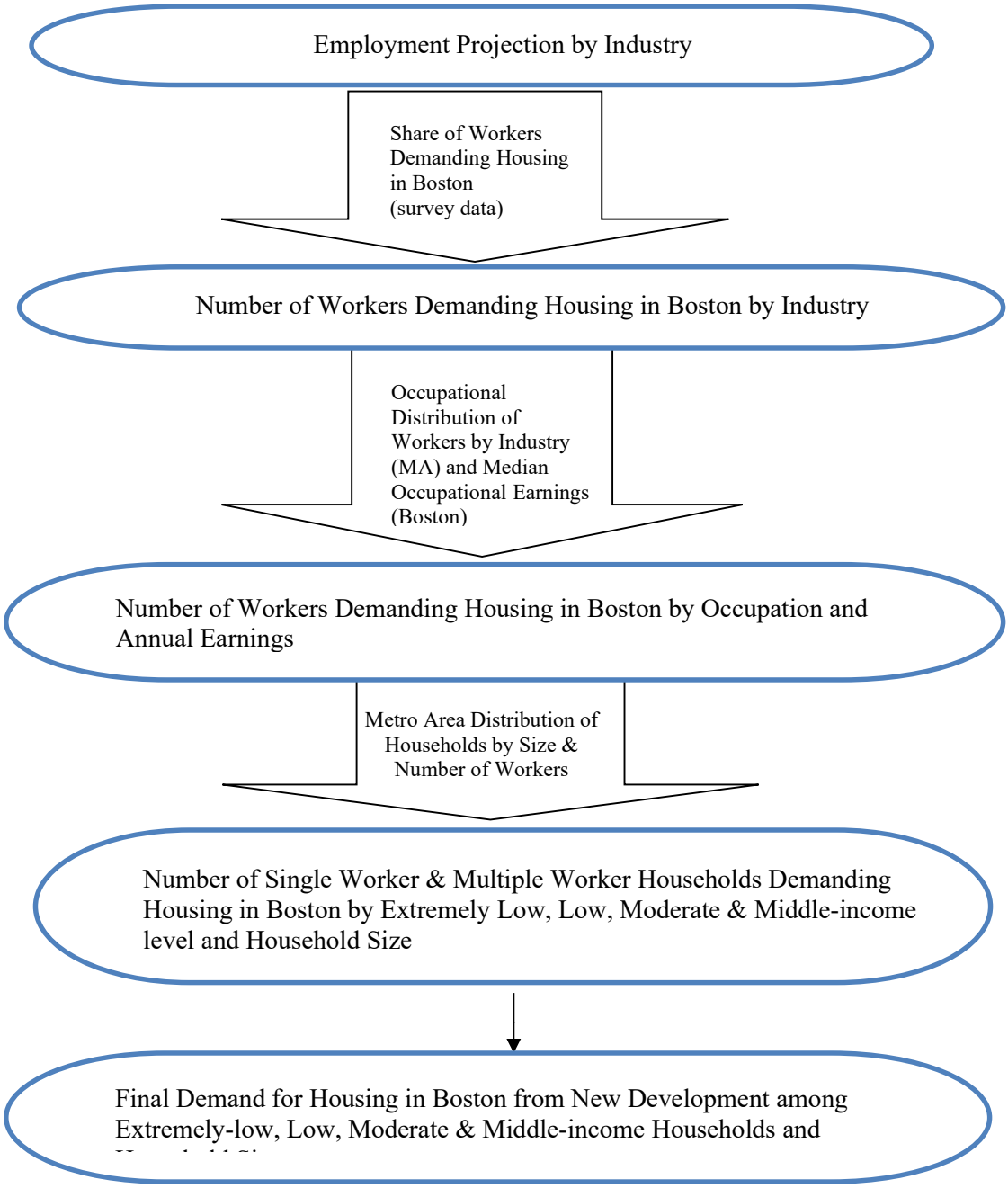
Source: Karl F. Seidman Consulting Services

[36] These figures reflect existing ratios among employers obtained from transportation planning surveys.

IV. Impact of Large Scale Development on Affordable Housing Demand

Using the 10-year development scenario and employment projections summarized in Table 3-6, this section forecasts the demand for affordable housing in Boston that will result from this development. Since this analysis utilizes several data sources and assumptions to prepare the forecast, a full explanation of the methodology used is provided along with the results. **Figure 4-1** provides an overview of the analytical steps and data sources for the housing demand projections.

Figure 4-1. Methodology and Data Sources for Housing Demand Analysis



Since demand for affordable housing is tied to household income, the first step projects the distribution of new jobs by earnings. Using May 2021 data for the occupational distribution by industry in Massachusetts[37], the number of new jobs in 22 occupational categories was calculated for each of the 20 industries expected to occupy new development. Earnings were then estimated for these occupations based on the median annual earnings for the respective occupations in May 2021 for the Boston Workforce Development Area[38], and adjusted for inflation by the Boston region Consumer Price Index to estimate earnings as of May 2022. These calculations yielded the projected number of jobs at different annual earning levels by occupation and industry.

Since new employees will live in a variety of communities, it is necessary to determine the share that will demand housing in Boston. To estimate the percent of new employees who will demand housing within the city, the results from a survey of employees in office, laboratory, institutional, hotel and retail buildings conducted in May and June 2022 were used. This survey measured demand by asking employees whether, as a result of obtaining a job in Boston, they either moved to the city or sought housing in Boston but did not move to the city due to housing costs. Based on the survey results, the percentage of new employees who are expected to demand housing in Boston is 22.2%. This percentage was multiplied by the gross number of new jobs in each industry to estimate the number of new workers who will demand housing in Boston, which equals 7,058. The occupational distribution for each industry was then applied to the number of workers in that industry who were expected to seek housing in Boston to estimate their earnings distribution.

The next step to project demand for affordable housing units among the 7,058 employees who are expected to seek housing in Boston required estimating the distribution of households for these workers by both the number of wage-earners and size. Since the employees in Boston's new developments will be drawn primarily from the greater Boston area, data for the distribution of households by number of earners and household size in the Boston metropolitan area were used to estimate the type of households for these employees[39]. Workers in each occupation expected to demand housing in Boston were first divided into one-, two-, three- and four-or-more-person households based on the metro area distribution[40]. Then each household size group was divided into one, two and three worker households, using the American Community Survey metro area percentages (see **Table 4-1**).

[37] Bureau of Labor Statistics (BLS) Occupational and Wage Statistics by State and Industry, May 2021 Estimates, https://www.bls.gov/oes/2021/may/oes_research_estimates.htm

[38] BLS Occupational Employment and Wage Statistics, https://lmi.dua.eol.mass.gov/LMI/OccupationalEmploymentandWageAllIndustries

[39] This data was from the 2020 five-year American Community Survey for the Boston-Cambridge-Newton MA-NH Metropolitan Area.

[40] From the 2020 five-year ACS, the ratios are: 27.6% one-person, 33.1% two-person 16.7% three person and 22.6% four or more.

Table 4-1. Household Size by Number of Wage-Earners, Boston-Cambridge-Nashua MA-NH NECTA

Number of Workers	One Worker	Two Workers	Three Workers	Total
One Person Household	100.0%	0.0%	0.0%	100.0%
Two Person Household	40.4%	59.6%	0.0%	100.0%
Three Person Household	30.3%	48.4%	21.2%	100.0%
Four or More Person Household	23.8%	47.4%	28.4%	100.0%

Source: US Census 2020 Five-Year American Community Survey

For single-earner households, the median wage for the occupation was used to estimate their household income and determine if they fell below the extremely low-income, low-income, moderate-income or middle-income thresholds for their respective household size (see **Table 4-2** for the respective income levels). Among the single earner households who are expected to demand Boston housing, 205 are estimated to be extremely low-income (less than 30% of area median income), 958 are projected to be low-income (between 30% and 60% of area median income), 248 are projected to be moderate-income (between 60% and 80% of area median income) and 1614 are estimated as middle-income (80% to 120% of area median income) for a total demand of 3,025 affordable housing units. Projecting affordable housing demand among multiple-earner households required estimating the earnings from the additional wage earners. To simplify this analysis, it was assumed that the second worker's earnings equaled the median annual wage for all occupations in the Boston Workforce Area, which was $74,154 adjusted for inflation to May 2022. This resulted in an additional 978 dual-worker households from new development that will demand housing in Boston, 83 in the moderate-income level and 895 in the middle-income category. No three-worker households fall within the moderate or middle-income ranges.

Table 4-2. Maximum Income Levels by Income Category, City of Boston, June 2022

Income Level	Description	One-Person Household	Two-Person Household	Three-Person Household	Four-Person Household
Extremely low-income	less than 30% of median income	$29,450	$33,650	$37,850	$42,050
Low-Income	30 to 60 % of median income	$58,920	$67,320	$75,720	$84,120
Moderate-Income	60 to 80% of median income	$78,550	$89,750	$100,950	$112,150
Middle-Income	80 to 120% of AMI	$117,800	$134,600	$151,450	$168,250

Source: City of Boston Mayor's Office of Housing

Across all household sizes and income groups, the total number of affordable housing units needed to meet the demand generated by new office and retail development is 4,003 units. **Table 4-3** summarizes the total projected demand for new housing by household size and among low-income, moderate-income and middle-income households.

Table 4-3 New Affordable Housing Demand in Boston from New Development Impact Project Developments* by Income Type and Household Size, 2022 to 2031

Income Group	One-Person Households	Two-Person Households	Three-Person Households	Four-Person Households	Total
Extremely-low income	0	103	39	63	205
Low-income	617	201	76	64	958
Moderate-income	11	31	55	234	331
Middle-income	959	875	306	369	2,509
Total	1,587	1,210	476	730	4,003

Source: Karl F. Seidman Consulting Services
*Includes Hotel, Institutional, Office, Lab and Retail Developments

V. Subsidy Required to Address Affordable Housing Demand

This section builds upon the framework established in the earlier sections to project the total subsidy required to address the projected increased demand for affordable housing generated by large-scale developments in Boston. Housing affordability is a function of household income and the cost of available rental and for-sale housing units in each real estate market. The City of Boston and the surrounding region suffer from a well-known and demonstrated lack of sufficient affordable housing. This section calculates the subsidy needed to create new affordable housing that satisfies the demand generated by new workers in new commercial and institutional development by comparing the total development cost of new affordable housing units to the housing prices that can be supported by extremely low-, low-, moderate-, and middle-income households. Before calculating the projected subsidy required, current housing conditions in Boston are reviewed to provide background and context.

Estimate of Required Affordable Housing Subsidy Contribution

The previous section projected the demand for affordable housing from new commercial development as 4,003 units for extremely low-, low-, moderate-, and middle-income households ranging in size from one person to four or more persons. This section determines the projected subsidy required to construct housing that is affordable for those households.

Following is a summary of data and analyses used in calculating the total per square foot subsidy from new non-residential development required to support development of new affordable housing for workers. The subsidies would be for extremely low-, low, moderate and middle-income households whose jobs would be in Boston's new commercial buildings over the next 10 years.

The analyses establish that affordable rents and affordable sales prices do not currently support development of new housing production due to high development costs. Therefore, to stimulate affordable housing development, subsidies or other incentives must be provided. This analysis estimates the amount of subsidy required to meet new affordable housing demand created by employees in the new commercial development. The total required subsidy is the estimated difference between the total development costs of producing new affordable housing units and the capitalized value of affordable rent and unit sale proceeds. The required subsidy is presented as a per square foot housing contribution for projected non-residential development over a 10-year period.

Methodology

The following methodology was used to calculate the subsidy required to produce sufficient housing to satisfy projected ten-year affordable housing demand generated by new development non-residential buildings.

- Estimate the number of extremely low-income, low-income, moderate-income, and middle-income households moving to or seeking to live in Boston that would be generated by new nonresidential development.
- Specify demand by number of persons in the household, number of bedrooms, and by tenure (i.e., renter-occupied units and owner-occupied units).

- Estimate the total development costs of affordable units to satisfy the demand generated based on the actual per-unit development costs of 30 new affordable housing developments completed recently in the City of Boston.
- Estimate the potential capitalized revenue due to annual rents and sales proceeds of affordable units segmented by middle-income, moderate-income, low-income, and extremely low-income households.
- Calculate the difference between the total development costs and the capitalized revenue that is internally generated by renters and owners. This amount is the total subsidy required to produce the targeted new affordable units created by demand from new workers in new non-residential developments.
- Divide the total subsidy required by the total non-residential square feet subject to the housing contribution. This amount is the per square foot subsidy projected to be required to produce the new affordable units created by demand from new workers in new nonresidential developments.

Most state and federal funding programs for affordable housing are targeted to low-income and moderate-income households. The state has a new workforce housing initiative that funds middle-income housing as well. Nonetheless, federal and state tax credits are the largest subsidy source for new affordable housing projects, and they prioritize creation of units for households below 50 percent AMI and 60 percent AMI. Therefore, because of the targeting of available subsidy sources of funding, it is likely that much of the new affordable housing created in Boston will be targeted to these income levels. As the following analysis shows, the amount of subsidy required to create housing for extremely low-income and low-income households is substantial. Yet moderate-income and middle-income households are also increasingly finding housing to be unaffordable in Boston's housing market.

The following key assumptions were made to calculate the housing subsidy required.

Unit Distribution for New Affordable Housing

The distribution of households by number of persons and income levels was derived in a prior section. The household sizes range from one person to four or more persons. One-person households are allocated as 75 percent studio units and 25 percent one-bedroom units. Two-person households are allocated as 20 percent to one bedroom units and 80 percent to two-bedroom units. Three-person households are allocated 80 percent to two-bedroom units and 20 percent to three-bedroom units. All four or more person households are allocated to three-bedroom units. Data in **Table 5-1** show the estimated distribution of housing units by size and income levels (extremely low-low-moderate-middle).

Table 5-1. Distribution of New Affordable Housing Demand by Number of Bedrooms and Household Income

	Households by Size				
	One Person	Two Person	Three Person	Four Person	Total
Total New Housing Units Needed Based on New Non-Residential Construction					**4,003**
Distribution of Units					
Extremely Low-income	0	103	39	63	205
Low-Income	617	201	76	64	958
Moderate-Income	11	31	55	234	331
Middle-Income	959	875	306	369	2,509
Total	**1,587**	**1,210**	**476**	**730**	**4,003**
Distribution of Units by Number of Bedrooms					
Studio	75%	0%	0%	0%	30%
One Bedroom	25%	20%	0%	0%	16%
Two Bedrooms	0%	80%	80%	0%	34%
Three Bedrooms	0%	0%	20%	100%	21%
Total	**100%**	**100%**	**100%**	**100%**	**100%**
Units by Number of Bedrooms					
Extremely Low-Income					
Studio	0	0	0	0	0
One Bedroom	0	21	0	0	21
Two Bedrooms	0	82	31	0	113
Three Bedrooms	0	0	7	63	70
Total	**0**	**103**	**38**	**63**	**204**
Low-Income					
Studio	463	0	0	0	463
One Bedroom	154	40	0	0	194
Two Bedrooms	0	161	61	0	222
Three Bedrooms	0	0	16	64	80
Moderate-Income					
Studio	8	0	0	0	8
One Bedroom	3	7	0	0	10
Two Bedrooms	0	24	44	0	68
Three Bedrooms	0	0	11	234	245
Middle-Income					
Studio	719	0	0	0	719
One Bedroom	240	175	0	0	415
Two Bedrooms	0	700	245	0	945
Three Bedrooms	0	0	61	369	430
Units by Size, Number of Bedrooms					
Studio	1,190	0	0	0	1,190
One Bedroom	397	243	0	0	640
Two Bedrooms	0	967	381	0	1,348
Three Bedrooms	0	0	95	730	825
Total Units	**1,587**	**1,210**	**476**	**730**	**4,003**

Note: Rounding may affect totals.

Source: City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.

Mix of Rental and Ownership Units

New affordable housing has primarily been supplied through rental housing, due to the available subsidy from federal and state sources. This analysis assumes that the affordable housing to be supplied will be a mix of rental and ownership units. The estimated required subsidy in this analysis assumes that:

- All the units for middle-income households will be ownership units.
- 25 percent of units for moderate-income households will be ownership units and the remaining 75 percent will be rental.
- All the units for extremely low-income and low-income households will be rental units.

Data in **Table 5-2** show the distribution of rental and home ownership housing units by size and income level.

Table 5-2. New Affordable Housing Demand in Boston by Renter and Owner-Occupied Units

	Households by Size					
	One Person	Two Person	Three Person	Four Person	Total	Percent to Total
Distribution of Units						
Extremely Low-Income	0	103	39	63	205	5%
Low-Income	617	201	76	64	958	24%
Moderate-Income	11	31	55	234	331	8%
Middle-Income	959	875	306	369	2,509	63%
Total Units	**1,587**	**1,210**	**476**	**730**	**4,003**	**100%**
Percent of Units that are Rental Housing [1/]						
Extremely Low-income	100%	100%	100%	100%		
Low-Income	100%	100%	100%	100%		
Moderate-Income	75%	75%	75%	75%		
Middle-Income	0%	0%	0%	0%		
Number of Rental Units						
Extremely Low-income	0	103	39	63	205	15%
Low-Income	617	201	76	64	958	68%
Moderate-Income	8	23	41	175	247	18%
Middle-Income	0	0	0	0	0	0%
Total	**625**	**327**	**156**	**302**	**1,410**	**100%**
Percent of Units that are Ownership Housing [1/]						
Extremely Low-income	0%	0%	0%	0%		
Low-Income	0%	0%	0%	0%		
Moderate-Income	25%	25%	25%	25%		
Middle-Income	100%	100%	100%	100%		
Number of Ownership Units						
Extremely Low-income	0	0	0	0	0	0%
Low-Income	0	0	0	0	0	0%
Moderate-Income	3	8	14	59	84	3%
Middle-Income	959	875	306	369	2,509	97%
Total	**962**	**883**	**320**	**428**	**2,593**	**100%**
Rental Units by Number of Bedrooms						
Studio	469	0	0	0	469	12%
One Bedroom	156	66	0	0	222	6%
Two Bedrooms	0	261	125	0	386	10%
Three Bedrooms	0	0	31	302	333	8%
Total Rental	**625**	**327**	**156**	**302**	**1,410**	**35%**
Ownership Units by Number of Bedrooms						
Studio	721	0	0	0	721	18%
One Bedroom	241	177	0	0	418	10%
Two Bedrooms	0	706	256	0	962	24%
Three Bedrooms	0	0	64	428	492	12%
Total Ownership	**962**	**883**	**320**	**428**	**2,593**	**65%**
Total Housing	**1,587**	**1,210**	**476**	**730**	**4,003**	**100%**

1/ Source: City of Boston.

Note: Rounding may affect totals.

Source: City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.

Calculation of Needed Subsidy

The following presents the analysis of estimated total development costs, supportable financing, and needed subsidy for affordable housing units that must be created to satisfy the new demand generated by workers in new commercial developments in Boston over the next 10 years. The analysis only presents selected tables that summarize the calculation of the needed subsidy. Additional tables in the Appendix detail all assumptions and intermediate calculations that underlie required subsidy calculation.

Development Project Costs

The costs metrics used to calculate the Total Development Cost are based on an inventory of 30 Boston housing projects recently completed, under construction or in pre-development as of May 2022, as well as other more current development cost estimates in funding applications to the city through August 2022. Data in **Table 5-3** show the calculation of the total development costs of 1,410 rental units and data in **Table 5-4** show the calculation of the total development costs of 2,593 ownership units.

Table 5-3. Calculation of Total Development Costs of Affordable Rental Housing Units in Boston over a 10-Year Period

Project and Cost Assumptions		
Number of Units	1,410	
Average Unit Size GSF [1/]	1,038	
Total Project GSF	1,464,000	
Cost Assumptions [2/]		
Soft Costs, including Design, Permitting, Overhead, Profit, and Contingency, as a Percent of Construction Cost	34.1%	
Construction Cost and Construction Contingency per SF	$337	
Land/Acquisition per Unit Costs [3/]	$39,000	
"Off Budget" per Unit Costs [4/]	$18,000	
Development Costs	**Costs**	**Percent to Total**
Soft Costs, including Design, Permitting, Overhead, and Developer's Fee, and Project Contingency	$167,965,000	22.7%
Construction Cost and Construction Contingency	492,782,000	66.5%
Land/Acquisition	54,990,000	7.4%
"Off Budget" Costs	25,380,000	3.4%
Total Development Costs (TDC)	**$741,117,000**	**100.0%**
TDC per Unit	***$525,615***	
TDC per GSF	***$506***	

1/ See Table A-1 in Appendix for mix of units by size.

2/ Development cost assumptions are based on average costs for recent experience of selected housing projects in Boston, including high-rise and mid-rise new construction projects and substantial and moderate renovation projects. Due to the variation in the size of the units demanded, construction costs are based on project size in square foot costs, with percentage increase for soft costs and per unit

3/ Rounded average per unit for affordable housing development projects where acquisition costs exceeded $250,000. Some projects will have no or low acquisition costs, city owned land for instance.

4/ The City of Boston has a total development cap of $500,000/unit for developers to obtain financing. With current increases on construction, acquisition, insurance and interest rates, project unit costs are exceeding that cap. To show costs lower and obtain funding, developers are getting creative by taking items off budget (or calling them extraordinary). Recent construction costs for projects submitted for fundings have a weighted average cost of $525,000 per unit.

Source: City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.

Table 5-4. Calculation of Total Development Costs of Affordable Ownership Housing Units in Boston over a 10-Year Period

Project Assumptions	
Number of Units	2,593
Average Unit Size GSF [1/]	1,052
Total Project GSF	2,729,000
Cost Assumptions [2/]	
Soft Costs, including Design, Permitting, Overhead, Profit, and Contingency, as a Percent of Construction Cost	34.1%
Construction Cost and Construction Contingency per SF	$337
Land/Acquisition per Unit Costs	$39,000
"Off Budget" per Unit Costs [4/]	$18,000

Development Costs	**Amount (Rounded)**	**Percent to Total**
Soft Costs, including Design, Permitting, Overhead, and Developer's Fee, and Project Contingency	$313,100,000	22.7%
Construction Cost and Construction Contingency	918,581,000	66.6%
Land/Acquisition	101,127,000	7.3%
"Off Budget" Costs	46,674,000	3.4%
Total Development Costs (TDC)	**$1,379,482,000**	**100.0%**
TDC per Unit	***$532,002***	
TDC per GSF	***$506***	

1/ See Table A-2 in Appendix for mix of units by size.

2/ Development cost assumptions are based on average costs for recent experience of selected housing projects in Boston, including high-rise and mid-rise new construction projects and substantial and moderate renovation projects. Due to the variation in the size of the units demanded, construction costs are based on project size in square foot costs, with percentage increase for soft costs and per unit acquisition costs for land and buildings.

3/ Rounded average per unit for affordable housing development projects where acquisition costs exceeded $250,000. Some projects will have no or low acquisition costs, city owned land for instance.

4/ The City of Boston has a total development cost cap of $500,000/unit for developers to obtain financing. With current increases on construction, acquisition, insurance and interest rates, project unit costs are exceeding that cap. To show costs lower and obtain funding, developers moving certain cost items "off budget" (or calling them extraordinary). Recent projects presented to the committee have ranged between $550,000 - 600,000/unit if the off budget / extraordinary costs are included.

Source: City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.

Development Project Revenue

Project revenue generation and the underlying development economics are different for rental and ownership housing.

Rental Housing

An important step in calculating the subsidy required to create new affordable housing units is to define the rental housing development project's revenue that will be used to support the development and operations of new affordable housing. This analysis assumes that the new rental housing will be solely supported by rental income from tenant households and ownership housing will be supported by the sales of affordable units. Affordable rents and sales prices are derived based on household income. In prior sections of this report, annual occupational wages were the input for establishing the demand for affordable housing among extremely low-, low-, moderate-, and middle-income households of new workers in new commercial development in Boston. The weighted average annual household income for each income level[41], as shown by the data in **Table 5-5**, is the basis for calculating affordable rents and sales prices that in turn support the development of affordable housing.

Table 5-5. Weighted Average Household Income by Income Group and Household Size, Households of Workers in Projected Non-Residential Development

	Households by Number of Persons			
	One Person	Two Person	Three Person	Four Person
Distribution of Weighted Average Income				
Extremely Low-income	NA	$33,487	$33,487	$36,050
Low-Income	$43,638	$49,384	$50,421	$55,027
Moderate-Income	$65,747	$83,373	$93,697	$105,084
Middle-Income	$105,015	$112,230	$115,136	$123,624

Source: Bureau of Labor Statistics, Karl F. Seidman Consulting Services; and, ConsultEcon, Inc.

The needed subsidy for new affordable rental housing is calculated first, followed by the calculation of the needed subsidy for affordable ownership housing.

[41] This average is based on the weighted average for annual household earnings based on median annual earnings for the occupations projected for extremely low, low, moderate and middle-income household as discussed in a prior section.

Affordable Rent Levels

The affordable rents for rental units are based on the estimated annual income of workers in the new commercial developments in Boston. Construction of the 1,410 rental units of affordable housing projected in this analysis are supported by rental revenue from tenants with subsidies used to fill the gap between rental revenue and the cost to develop the housing. In general, the federal Department of Housing and Urban Development (HUD) is a source of many affordable housing subsidies. HUD defines housing costs as affordable to a household when the total cost of shelter consumes no more than 30 percent of gross (total) income. For this analysis, households are assumed to pay 30 percent of household income in rent. Data in **Table 5-6** detail the assumed income levels of households to derive the total gross rental revenue for the 1,410 units, based on the distribution of households by size and income. Total annual gross rental revenue for the units is estimated at $22.8 million.

Table 5-6. Annual Rental Revenue by Household Income and Size of Household

Household Size	Annual Income [1/]	Applicable Monthly Rent [2/]	Number of Households	Total Annual Rent
Extremely Low-Income Households				
1 Person	NA	NA	NA	NA
2 Persons	$33,487	$837	103	$1,034,532
3 Persons	$33,487	$837	39	$391,716
4 Persons	$36,050	$901	63	$681,156
Low-Income Households				
1 Person	$43,638	$1,091	617	$8,077,764
2 Persons	$49,384	$1,235	201	$2,978,820
3 Persons	$50,421	$1,261	76	$1,150,032
4 Persons	$55,027	$1,376	64	$1,056,768
Moderate-Income				
1 Person	$65,747	$1,644	8	$157,824
2 Persons	$83,373	$2,084	23	$575,184
3 Persons	$93,697	$2,342	41	$1,152,264
4 Persons	$105,084	$2,627	175	$5,516,700
Middle-Income Households				
1 Person	$105,015	$2,625	0	$0
2 Persons	$112,230	$2,806	0	$0
3 Persons	$115,136	$2,878	0	$0
4 Persons	$123,624	$3,091	0	$0
Total Households / Housing Units			**1,410**	
Total Annual Rent				**$22,772,760**

Aggregate Annual Rent by Income Level	Number of Units	Total Annual Rent (Rounded)	Percent of Total Rent	Average Monthly Rent
Extremely Low-income	205	$2,107,404	9.3%	$857
Low-Income	958	$13,263,384	58.2%	$1,154
Moderate-Income	247	$7,401,972	32.5%	$2,497
Middle-Income	0	$0	0.0%	$0
Total	**1,410**	**$22,772,760**	**100.0%**	**$1,346**

1/ Weighted average annual earnings based on anticipated mix of occupations and wages in new non-residential development in Boston.

2/ Assumed at 30% of monthly income. Rents are rounded to nearest $1.

Note: Rounding may affect totals.

Source: City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.

To calculate the rental revenue available to support the total development costs described above, the gross rents must be adjusted to reflect lost revenue due to periodic vacancies and the operating costs of maintaining and managing housing. As shown by data in **Table 5-7**, vacancy is assumed at 4 percent of gross rental revenue. Operating costs typically include such items as building management, janitorial services, trash removal, building maintenance, landscaping, marketing and other administrative costs. For this analysis, the full cost of utilities is also included.

MHP's portfolio contains operating expense comps from 32 comparable urban metro Boston projects from 2020-2021 property financial audits or operating statements. The average was $12,833 per unit in operating cost. For the purposes of this analysis, it is assumed that the operating costs of newer and more efficient construction would be 15 percent lower than the average of the existing properties. This would bring total operating costs to $10,880 per unit or $15.3 million total. Net rental income after deducting vacancy and operating costs is estimated at $6.5 million.

Rental Affordability Gap and Needed Subsidy

The next step is to find the gap in project finance between the permanent mortgage and developer equity that the net rental income can support and the total development costs of the 1,410 rental units. In general, the loan amount that lenders will approve is based on the income stream from the project. In this case, the annual net income from rents is $6.5 million. However, lenders prefer to build into their mortgage calculations a cushion between projected net income from rents and the annual debt service needed to pay down the loan. The debt coverage ratio (ratio of net income to allowable debt) reduces the effective amount of net income that can be used to support a mortgage. This analysis assumes a debt coverage ratio of 1.15, based on permanent financing programs offered by the Massachusetts Housing Partnership. After adjusting the net income by the debt coverage ratio, the project has $5.7 million in annual net income with which to pay the debt service on a permanent mortgage.

The total allowable permanent loan is calculated by dividing the net income by the mortgage constant, based on a 6.604 percent mortgage constant, (assuming the available current Massachusetts Housing Partnership financing rate amortized over a 30-year period). The permanent loan that could be supported by the resident households is $85.9 million. The annual revenue not required for the mortgage is then available to support equity investment. Based on a required return of 8 percent, this revenue would support $12.2 million in equity investment. Given the total development costs of $741 million, the subsidy required to create 1,410 new affordable rental housing units is $643 million, approximately 87 percent of the total development cost (TDC).

Table 5-7. Calculation of Financing Gap for Affordable Housing Rental Units

			By Household Type			
		All Units	Extremely Low Income	Low Income	Moderate Income	Middle Income
Potential Development Costs						
Number of Units		1,410	205	958	247	0
Percent to Total			*14.5%*	*67.9%*	*17.5%*	*0.0%*
TDC per Unit [1/]		$525,615	$621,029	$466,801	$674,538	$0
TDC per GSF		$506	$506	$506	$506	$506
Total Gross Square Footage (GSF)		1,464,000	251,000	883,000	329,000	0
Total Development Costs (TDC) (Rounded)		**$741,117,000**	**$127,311,000**	**$447,195,000**	**$166,611,000**	**$0**
Net Rental Income	**Unit Factor**	**Amount**	**Amount**	**Amount**	**Amount**	**Amount**
Gross Annual Rent		$22,772,760	$2,107,404	$13,263,384	$7,401,972	$0
Less Vacancies [2/]	4% of Gross Rent	($910,910)	($84,296)	($530,535)	($296,079)	$0
Less Total Operating Costs [3/]	$10,880 per Unit	($15,340,800)	($2,230,400)	($10,423,040)	($2,687,360)	$0
Net Operating Income (NOI) [4/]		**$6,521,050**	**($207,292)**	**$2,309,809**	**$4,418,533**	**$0**
Derivation of Permanent Mortgage / Supportable Debt Calculation		**Amount**	**Amount**	**Amount**	**Amount**	**Amount**
Net Operating Income (NOI)		$6,521,050	$0	$2,309,809	$4,418,533	$0
Debt Coverage Ratio [5/]		1.15	1.15	1.15	1.15	1.15
Available for Debt Service		$5,670,478	$0	$2,008,529	$3,842,203	$0
Mortgage Constant [5/]		6.604%	6.604%	6.604%	6.604%	6.604%
Permanent Mortgage / Supportable Debt (Rounded)		**$85,862,000**	**$0**	**$30,413,000**	**$58,178,000**	**$0**
Supportable Equity Calculation		**Amount**	**Amount**	**Amount**	**Amount**	**Amount**
Required Return on Equity		8.0%	8.0%	8.0%	8.0%	8.0%
Revenue Available for Return to Equity		$978,157	$0	$346,471	$662,780	$0
Supportable Equity Investment (Rounded)		**$12,227,000**	**$0**	**$4,331,000**	**$8,285,000**	**$0**
Financing Gap Calculation		**Amount**	**Amount**	**Amount**	**Amount**	**Amount**
Total Development Costs		$741,117,000	$127,311,000	$447,195,000	$166,611,000	$0
Less Permanent Mortgage / Supportable Debt		($85,862,000)	$0	($30,413,000)	($58,178,000)	$0
Less Supportable Equity		($12,227,000)	$0	($4,331,000)	($8,285,000)	$0
Financing Gap (TDC-Mortgage-Equity)		**$643,028,000**	**$127,311,000**	**$412,451,000**	**$100,148,000**	**$0**
Financing Gap as a Percent of TDC		*86.8%*	*100.0%*	*92.2%*	*60.1%*	*0.0%*

1/ Variation in TDC per unit for various income levels is due to the differing mix of units. In reality, most developments would be mixed income, targeted to multiple income levels, and the mix of units would vary from project to project.

2/ Source: City of Boston.

3/ Based on 85% of Massachusetts Housing Partnership average operating expenses per unit ($12,800) for affordable multi-family developments in portfolio in Metro Boston. Costs are typical of CAM expenses–Administrative, Utilities, Maintenance, Insurance, Property Taxes--that would be charged to the renter or the building owner would absorb.

4/ NOI is negative based on this model. In practice, any negative income based on supportable rents at 30% would be offset by income from units available at to higher incomes at mixed income developments or offset by other sources of subsidy such as housing vouchers.

5/ Source: ConsultEcon calculation of mortgage constant based on interest rate as of July 21, 2022 for the Massachusetts Housing Partnership Direct Lending, $5 million for 20 year term and 35 year amortization.

Note: Rounding may affect totals.

Source: City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.

Ownership Housing Development Project Revenue

The average sales price of affordable units sold in Boston is the basis for estimating the sales proceeds available to support the creation of 2,593 affordable ownership units in Boston. Of the total, 84 units are for moderate-income households and 2,509 units are for middle-income households.

As shown by analysis in **Table 5-8**, the "affordable" sales price is derived based on 30 percent of gross income spent on housing and estimates of housing costs, the same as rental housing. Housing costs for ownership units include mortgage payments based on 5% down payment on the home, real estate taxes and condo fees. (Private Mortgage Insurance is not included in this analysis as it is waived through a housing lending program offered by the Massachusetts Housing Partnership.) It is assumed that all extremely low- and low-income units are all rental units, so estimates of sales prices based on low-income earnings were not prepared.

Table 5-8. Aggregate Affordable Ownership Unit Sales by Household Income and Size of Unit

Household Size	Annual Income [1/]	Monthly Housing Costs [2/]	Number of Households	Supportable Sales Price [4/]	Total Sales
Moderate Income					
Studio	$73,965	$1,849	2	$279,835	$559,670
One bedroom	$60,902	$1,523	3	$220,942	$662,826
Two bedrooms	$93,117	$2,328	17	$357,561	$6,078,537
Three bedrooms	$104,231	$2,606	62	$400,715	$24,844,330
Middle Income Households					
Studio	$105,051	$2,626	719	$396,012	$284,732,628
One bedroom	$107,994	$2,700	415	$426,766	$177,107,890
Two bedrooms	$112,959	$2,824	945	$446,546	$421,985,970
Three bedrooms	$122,473	$3,062	430	$484,510	$208,339,300
Total Households / Housing Units			**2,593**		
Total Sales					**$1,124,311,151**

Aggregate Sales by Income Level	Number of Units	Total Sales	Percent of Total	Average Sales Price
Moderate Income	84	$32,145,363	2.9%	$382,683
MIddle Income	2,509	$1,092,165,788	97.1%	$435,299
Total	**2,593**	**$1,124,311,151**	**100.0%**	**$433,595**

1/ See Appendix Table A-3.

2/ Assumed at 30% of monthly income. Rounded to nearest $1.

3/ See sales price analysis in Appendix A-4. Rounded to nearest $1.

Note: Rounding may affect totals.

Source: City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.

Ownership Housing Needed Subsidy

The affordability gap in project financing of ownership units is the difference between the TDC and the proceeds from the sale of the estimated required 2,593 ownership units. Based on the mix of units and the assumed sales prices, the total estimated sales proceeds are $1.12 billion. Assuming TDC of $1.38 billion, the estimated financing gap for 2,593 affordable home ownership units is $255 million, which is approximately 19 percent of the TDC. Data in **Table 5-9** summarize the subsidy needed for ownership units.

Table 5-9. Calculation of Financing Gap for Affordable Ownership Housing Units

				By Household Type	
			All Units	Moderate Income	Middle Income
Potential Development Costs					
Number of Units			2,593	84	2,509
Percent to Total				*3.2%*	*96.8%*
TDC per Unit [1/]			$532,002	$672,643	$527,294
TDC per GSF			$506	$506	$506
Total Gross Square Footage (GSF)			2,729,000	112,000	2,617,000
Total Development Costs (TDC) (Rounded)			**$1,379,482,000**	**$56,502,000**	**$1,322,980,000**
Aggregate Unit Sales Proceeds	**Units**	**Average Price**	**Sales Proceeds**	**Sales Proceeds**	**Sales Proceeds**
Moderate Income	84	$382,683	$32,145,363	$32,145,363	$0
Middle Income	2,509	$435,299	$1,092,165,788	$0	$1,092,165,788
Total Sales Proceeds (Rounded)	**2,593**	**$433,595**	**$1,124,311,000**	**$32,145,000**	**$1,092,166,000**
Financing Gap Calculation			**Amount**	**Amount**	**Amount**
Total Development Costs			$1,379,482,000	$56,502,000	$1,322,980,000
Less Sales Proceeds			($1,124,311,000)	($32,145,000)	($1,092,166,000)
Financing Gap (TDC-Sales Proceeds)			**$255,171,000**	**$24,357,000**	**$230,814,000**
Financing Gap as a Percent of TDC			*18.5%*	*43.1%*	*17.4%*

Note: Rounding may affect totals.

1/ The moderate-income units cost more than the middle-income units because they include a high proportion of 3-bedroom units that are larger and therefore more costly.

Source: City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.

Subsidy Needed to Satisfy Ten-Year Affordable Housing Demand

The total development costs for rental and ownership units in Boston that satisfy the demand for new affordable housing from workers in new non-residential developments is $2.12 billion. The total financing gap for the 4,003 rental and ownership units is $895 million, approximately 42 percent of the TDC. The total subsidy is then divided by the total estimated commercial development building area.

Based on an estimated 14.8 million square feet of non-residential space projected over 10 years that are subject to the current housing exaction standards, the total subsidy required is estimated at $80.20 per SF of non-residential development, as shown by data in **Table 5-10**. This represents the maximum linkage fee level that is warranted based on the legal test that linkage fees must be proportional to impact they serve to mitigate.

Table 5-10
Derivation of Financing Gap for New Affordable Rental and Ownership Units per Square Foot of Projected Commercial Development

	All Units	Extremely Low Income	Low Income	Moderate Income	Middle Income
Total Development Cost [1/]	$2,120,599,000	$127,311,000	$447,195,000	$223,113,000	$1,322,980,000
Total Financing Gap Required [1/]	$895,081,000	$127,311,000	$412,451,000	$124,505,000	$230,814,000
Percent of TDC that is the Financing Gap	42.2%	100.0%	92.2%	55.8%	17.4%
Derivation of Commercial Square Footage Subject to Housing Exaction					
Total Commercial Square Footage	14,861,000	14,861,000	14,861,000	14,861,000	14,861,000
Square Footage Exempt from the Housing Exaction under Current Policy [1/]	3,700,000	3,700,000	3,700,000	3,700,000	3,700,000
Commercial Square Footage Subject to the Housing Exaction	11,161,000	11,161,000	11,161,000	11,161,000	11,161,000
Financing Gap per Square Foot of New Commercial Development [2/]	**$80.20**	**$11.41**	**$36.95**	**$11.16**	**$20.68**

1/ Per the City of Boston Incentive Zoning Ordinance, the first 100,000 SF of non-residential building area is exempt from the Housing Exaction. It is assumed that non-residential projects in the future average approximately 400,000 GSF, based on the average project over 100,000 SF that is board approved. Across 37 projects, 3.7 million SF is assumed to be exempt from the Housing Exaction, per the current ordinance.

2/ Total Financing Gap divided by the total Commercial Square Footage Subject to the Housing Exaction.

Note: Rounding may affect totals.

Source: City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.

Modified Subsidy Required Based on Other Subsidy Sources

This analysis calculates the full cost of the financing gap due to the housing demand generated by workers of households in projected large-scale developments in the City of Boston. Boston has relatively high affordable housing development costs, given the scarcity of vacant land, and high costs. The purpose of affordable housing is to limit the rental or mortgage payments of low-income households to 30% which is considered "affordable"; this creates a limited revenue stream to finance development costs. Therefore, the City and developers are challenged to find additional sources of funding to fill the gap between the rents and sales proceeds that extremely low, low, and moderate-income families can afford and the development financing that would be incurred by affordable housing developers. Since most affordable housing developers layer multiple funding sources to support the construction of new housing units, the housing exaction will work in conjunction with other financing sources to fill the $895 million financing gap.

The housing exaction due to new commercial development is contributed to the Neighborhood Housing Trust (NHT). Because there are other sources of funding available for development of new affordable housing in Boston, the housing exaction to the NHT does not have to provide all the gap funds needed to build affordable housing. In practice, the NHT has only been needed to cover 4.1% of the of the total financing gap used in recent affordable rental housing projects and none of the gap for recent affordable ownership housing projects in Boston, as shown by data in **Table 5-11**. Overall, the total City funds including NHT and other funds accounted for 14.7% of rental projects, and 58.9% of ownership projects. It should be noted that most of the funds for affordable housing are available only to projects targeting extremely low and low-income households.

Table 5-11. Sources of Funds for Recent NHT Supported Housing Projects in Boston

All Sources of Funds for Affordable Housing	Rental Projects [1/] Residential TDC	Rental Projects [1/] Percent to Total Sources	Ownership Projects [1/] Residential TDC	Ownership Projects [1/] Percent to Total Sources	Total Residential TDC	Total Percent to Total Sources
City NHT	$25,668,984	3.0%	$0	0.0%	$25,668,984	2.9%
City Other	66,307,922	7.8%	13,224,995	29.1%	79,532,917	8.8%
Commonwealth Grant and Debt Programs	210,022,456	24.6%	9,239,520	20.3%	219,261,976	24.4%
Tax Credits/Federal Funds	321,667,453	37.6%	0	0.0%	321,667,453	35.7%
Total Financing Gap Funds	**$623,666,815**	**73.0%**	**$22,464,515**	**49.4%**	**$646,131,330**	**71.8%**
Debt/Equity/Other Private and Unaccounted for	230,777,340	27.0%	23,043,501	50.6%	253,820,841	28.2%
Total Sources of Funds	**$854,444,155**	**100.0%**	**$45,508,016**	**100.0%**	**$899,952,171**	**100.0%**
Total Financing Gap Funds (NHT + Other Sources of Financing Gap Funds)	**$623,666,815**		**$22,464,515**		**$646,131,330**	
NHT Percent of Total Financing Gap Funds [3/]	***4.1%***		***NA***		***4.0%***	
NHT "Leverage" Ratio, NHT to Other Financing Gap Funds [4/]	***23.30***		***NA***		***24.17***	
City Percent of Total Financing Gap Funds [3/]	***14.7%***		***58.9%***		***16.3%***	
City "Leverage" Ratio, City Funds to Other Financing Gap Funds [4/]	***5.78***		***0.70***		***5.14***	

1/ Source: City of Boston. Based on city funded projects, including 24 rental projects and 6 ownership projects.

2/ CDBG = Community Development Block Grant. HOME funds are another federal program that supports housing.

3/ NHT or total City contribution divided by the Total Financing Gap Funds.

4/ The leverage ratio is equal to the Other Sources of Financing Gap Funds divided by NHT or total City contribution.

Source: City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.

Housing Exaction Level Scenarios

Data in **Table 5-12** show housing exaction level scenarios including scenarios that model two fee increase scenarios of $10 and $20, as well as applying the historic ratio of NHT and total City funds to total funds needed to fill the full financing gap. Increasing NHT's share of the required financing gap to leverage more state funds and counteract the decline in federal funds may be required to produce the level affordable housing required to satisfy the new demand from commercial development. NHT funding is an important component of the City's affordable housing production and has a substantial impact because the Commonwealth requires the City to provide matching funding as a way of investing in its own affordable housing projects. Without City generated sources like NHT and IDP, the City would not have the primary sources of funding to leverage state funds effectively.

Table 5-12. Housing Exaction Scenarios for the City

	Factor	Rental + Ownership
Total Financing Gap per Square Foot of Commercial Development		$80.20
Current Linkage Fee	***16.2%***	***$13.00***
Current NHT Share of Existing Affordable Housing Funds to Fill the Financing Gap [1/]	2.9%	$2.36
Current Total City Share of Existing Affordable Housing Funds to Fill the Financing Gap [1/]	27.3%	$21.88
Housing Exaction Scenarios		
$10 fee increase	28.7%	$23.00
$20 fee increase	41.1%	$33.00

1/ The factors used in this analysis are weighted based on the mix of rental and owner units in the calculation of the financing gap of affordable housing demand due to commercial development. For 24 NHT rental projects in the past, the NHT accounted for 4.1% of financing gap funds and total City sources accounted for 14.7% of financing gap funds. For 6 NHT ownership projects in the past, the NHT accounted for **NONE** of financing gap funds and total City sources accounted for 58.9% of financing gap funds.

NA = Not applicable.

Source: City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.

VI. Employment Impact and Subsidy Required to Address Resident Employment, Education and Training

Boston's new non-residential development will create thousands of new jobs that can provide employment opportunities for Boston residents and increase the earnings for the city's low-income and moderate-income workers. Boston's job linkage policy provides funding for employment and training programs and related service to help these workers gain access to the non-manufacturing jobs that dominate new development in Boston. City policy allows jobs linkage funding awarded through the Neighborhood Jobs Trust (NJT) to be used for: occupational skills training; other forms of job training; Adult Basic Education (ABE); and English for Speakers of Other Languages (ESOL). Funding can also be used for post-secondary credentials that help connect residents to job opportunities. Furthermore, the NJT requires programs to include services beyond direct education and training that advance successful job placement and retention for participants, including career educational and counseling, support services, job placement, and post-placement/retention services[42]. As noted in Section II, there also are significant racial disparities in employment rates, higher-paying occupations and educational attainment (see Tables 2-7, 2-8 and 2-11) that contribute to the racial disparities in income and wealth among Boston residents (see Figures 2-19 and 2-20). Programs and services funded through jobs linkage can capitalize on the jobs in new development projects to help overcome historic and structural barriers to better paying occupations among workers of color in Boston and help reduce these racial disparities.

Methodology

This section estimates the jobs linkage fee level needed to fill the funding gap for employment and training services needed to connect low-income and moderate-income workers with jobs in Boston's projected new development over the next decade. The methodology for this analysis has four components:

1. Forecasting the demand by occupation for 31,794 new jobs projected to be created by new development over the next ten years. This forecast uses the May 2021 occupational distribution by industry for Massachusetts prepared by the US Bureau of Labor statistics[43] and focuses on jobs that do not require a college degree. Two demand scenarios were used: 1) Boston residents fill 40% of these jobs, which reflects the current share of jobs within the city held by Boston residents; 2) Boston residents fill 50% of jobs, which reflects an increase in city resident employment that may be feasible and desirable for the city and employers, given the challenges in hiring workers during a tight labor market and the potential environmental benefits from having a higher share of workers living and commuting within Boston.
2. Estimating the supply of Boston workers from occupational training programs in the existing education and training ecosystem, based on several parameters that include the number of participants and the share who graduate, are placed in jobs and are Boston residents. Data for these estimates came from a variety of sources, including interviews with training providers, directories of training providers from the Boston Private Industry Council and MassHire, the national Integrated Postsecondary Education Data System

[42] Request for Proposals Neighborhood Jobs Trust, FY2022
[43] https://www.bls.gov/oes/2021/may/oes_research_estimates.htm

*(*IPEDS*)* database for community college associate degrees and certificates, Boston Public School data on vocational program graduates and data on the use of Individual Training Account (ITA) vouchers under the federal Workforce Innovation and Opportunities Act (WIOA). For programs in which data was not available, assumptions for parameters were made based on data for similar programs. Since these training programs will place workers with employers in existing buildings and new development, 40% of the projected supply was assumed to fill jobs at new development projects[44]. Low-supply and high-supply estimates were prepared taking into account planned expansions in some training programs and post-pandemic increase in program participation and use of ITAs.

3. Estimating the gap between employer demand and system supply for specific occupations and groups of occupations and the cost to provide additional training to fill this gap. Cost estimates were based on data from the Neighborhood Jobs Trust and individual training providers on the cost to training a worker for different occupations. In some cases, these costs include services beyond skills training that improve participant training completion, job placement and post-employment support.
4. Estimating the cost for related education and support that are critical for workers to access and succeed in occupational training, including English for Speakers of Other Languages (ESOL), Adult Basic Education, including High School equivalency programs (ABE), skill upgrading after employment to help workers advance into higher paying positions and stipends to offset lost income while attending training programs.

Overall Occupational Demand

Table 6-1 and Table 6-2 present the ten-year projected employment from new development by industry and occupation, respectively. The projected new jobs are heavily concentrated in four industries that account for 80% of the total: life science (including hospital research) at 27.3%; information technology (IT) at 26.1%; health care (hospitals and medical offices) at 13.1%; and hospitality (restaurants and hotels) at 13.6%. Since the vast majority of projected new jobs are in these four industries, and the training ecosystem is different for each industry, a separate analysis of occupation demand, the training supply and the supply gap for each industry is discussed below, followed by a final analysis of the remaining jobs.

[44] This percentage reflects the projected ten-year job growth in tenant industries as a percentage of Boston's job growth in these industries over the past ten years.

Table 6-1. Projected Employment by Industry for New Boston Development, 2022 to 2031

Industry	Number of Employees	Percent of Total
Scientific Research & Development /Life Science	7,489	23.6%
Computer Systems Design	3,827	12.0%
Electronic Shopping & Mail-Order Houses	1,913	6.0%
Software	1,913	6.0%
Management and Technical Consulting	1,277	4.0%
Architectural and Engineering Services	957	3.0%
Other Financial Investment Activities	957	3.0%
Accounting and Bookkeeping Services	637	2.0%
Data Processing, Hosting & Related Services	637	2.0%
Management of Companies and Enterprises	637	2.0%
Restaurant	3,442	10.8%
Clothing Stores	61	0.2%
Home furnishing stores	61	0.2%
Grocery stores	166	0.5%
Pharmacies	123	0.4%
Daycare	82	0.3%
Bank branches	82	0.3%
Medical offices-Ambulatory HC services	302	0.9%
Hotels	890	2.8%
Colleges and Universities- Academic	1,311	4.1%
Hospitals-Research	1,178	3.7%
Hospitals- Clinical	3,852	12.1%
Total	31,794	100.0%

Source: Karl F. Seidman Consulting Services

Table 6-2. Projected Employment by Occupational Group for New Boston Development, 2022 to 2031

Occupational Group	Number of Jobs	Percent of Jobs
Management	5,735	18.0%
Business & Financial Operations	3,869	12.2%
Computer & Mathematical	4,657	14.6%
Architectural & Engineering	1,225	3.9%
Life, Physical & Social Science	2,506	7.9%
Community Service	153	0.5%
Legal	160	0.5%
Educational, Training & Library	619	1.9%
Art. Design, Media	397	1.2%
Health Care Practitioners & Technician	2,351	7.4%
Health care support	632	2.0%
Protectective Services	90	0.3%
Food Preparation & Serving	3,461	10.9%
Buildings & Grounds	418	1.3%
Personal Care	139	0.4%
Sales & Related	1,536	4.8%
Office & Administrative	2,977	9.4%
Farming and Fishing	0	0.0%
Construction & Extraction	38	0.1%
Installation, Maintenance & Repair	176	0.6%
Production	391	1.2%
Transportation and Material Moving	267	0.8%

Source: Karl F. Seidman Consulting Services

The occupational distribution in Table 6-2 shows that over two-thirds (67.7%) of the projected employment will occur in higher skill occupational groups that largely require at least a college degree, including, Management, Business & Financial Operations, Computer & Mathematical, Architectural & Engineering, Life, Physical & Social Science, Legal, Educational, Training & Library and Health Care Practitioners & Technicians. However, this percentage overstates the share of jobs that require a college degree, since there are jobs in these occupational groups that do not require a college degree, e.g., Computer Network Support Specialists in the Computer & Mathematical Group and Pharmacy Technicians within Health Care Practitioners & Technicians. These jobs will be included and discussed below for each of the four key industries. Among the one-third of projected new jobs in occupational groups that primarily do not require a college degree, 77% are in three categories: 1) Food Preparation & Serving, 2) Sales and Related Occupations; and 3)Office & Administrative. While these occupations are important sources of entry-level jobs for workers with limited work experience and/or education, they are low-paying occupations. While the median annual earnings, as of May 2021, for all occupations in the Boston Workforce Development Area was $68,973, the median annual earnings for Food Preparation & Serving, Sales and Office & Administrative occupations were $31,147, $48,900 and $48,294,

respectively. This highlights the importance of funding skill upgrading and career advancement training to help these entry-level workers increase their earnings over time.

Life Science

Occupational Demand

A total of 8,667 new jobs at life science firms and hospital research labs are expected from new development projects in Boston. The vast majority of these jobs are in occupations that require a bachelor's degree or higher. A recent report by TEConomy Partners, LLC for the Massachusetts Biotechnology Educational Foundation found that 11% of life science industry jobs in Massachusetts don't require a bachelor's degree[45]. Based on this figure, 953 jobs would be accessible to Boston residents without a college degree. Interviews with training providers indicated that the 11% figure covers statewide employment that includes manufacturing jobs and thus may be too high for firms in Boston lab buildings, that will focus on research and development. Based on the state occupational distribution for the life science research and development industry, there will be 690 engineering/lab/research technician jobs among the 8,667 industry jobs. These technician jobs had average 2021 median annual earnings of $54,873. While the skills for these technician jobs can be developed through specialized training programs and do not require a bachelor's degree, some employers do require a four-year college degree for technician jobs. Based on these data, the estimated life science industry demand for entry-level and middle-skill jobs that do not require a bachelor's degree is 820. This translates into 410 and 328 jobs for Boston residents based on 50% and 40% resident employment, respectively.

Training Supply

Current training capacity for life science industry jobs is modest with limited participation by Boston residents and employers. The existing training programs targeted to the life science occupations and firms are:

- Three non-profit programs at Just-A-Start, Lab Central, Jewish Vocational Services (JVS). The JVS program prepares people for additional education at Quincy College rather than for employment;
- Two apprenticeship programs at Massachusetts Biotechnology Education Foundation- one for Biomanufacturing Technician and a second for Clinical Research Associate;
- Certificate and associate degrees at four community colleges-Ben Franklin Institute of Technology (BFIT), Bunker Hill Community College (BHCC), Quincy College (QC) and Roxbury Community College (RCC); and
- Boston Public Schools biotechnology vocational education program.

Collectively, these programs graduate 225 trainees with 74 estimated to be placed into employment. However, data from training providers indicate that Boston residents represent a small share of participants—18% for the Mass Biotechnology Education Foundation and 8% of the Quincy College graduates. Moreover, some programs do not place many graduates with Boston firms. Consequently, the current life science training system is estimated have 10% of its graduates as Boston residents placed in jobs at Boston firms—7 per year and 70 over the ten-year

[45]TEConomy Partners, LLC, *2022 Massachusetts Life Sciences Employment Outlook,* June 2022

period. Training capacity is likely to grow over the next decade with multiple providers planning program expansions to add to the range of occupations covered and open new training facilities, including several in Boston. These expansions are estimated to increase the annual number of Boston residents trained and placed in jobs to 27, yielding a ten-year high-supply estimate of 270 positions.

Combining occupational demand and the low training supply projection, there is a ten-year gap of 258 and 340 training seats for the 40% and 50% resident employment scenarios, respectively. Under the high training supply estimate, the gap is 124 seats under the 40% resident employment scenario and 208 seats for 50% resident employment.

Information Technology

Occupational Demand

Demand for workers in IT occupations is projected at 4,657-this includes jobs within IT-related industries and positions across other industries, many of which have some demand for IT workers. Approximately 21%, or 999 of these jobs are estimated to be accessible for workers without a bachelor's degree and include Network Support Specialists, User Support Specialists and Web Design, a portion of the Computer Programs and Software Developer positions. These IT occupations are especially good-paying positions with average median annual earnings of $91,011 in 2021($78,800 without programmers & software developers). Programmers and Software Developers, which constitute half of the projected IT jobs, typically require a bachelor's degree. However, there are a growing number of training programs providing an alternative pathway for these jobs and increased employer interest in skill-based rather than degree-based job requirements. Based on interviews with training providers and researchers, 10% of the Computer Programmer and Software Developer jobs are estimated to be accessible to workers with industry-based skills training without a college degree. These 999 jobs translate into 500 and 400 jobs for Boston residents based on 50% and 40% resident employment, respectively.

Training Supply

A large and diverse training system for IT occupations exists in Boston that includes:

- Twenty-four different certificate and associate degree programs at BHCC, Bay State College, BFIT, Quincy College and RCC[46]; and
- Over a dozen non-profit and for-profit providers, some training for multiple occupations and jobs, that use different program formats and lengths that include coding bootcamps, on-line courses, extended courses and long-term programs with apprenticeships.

Boston's Private Industry Council manages an IT/Tech collaborative of leading technology and IT professionals working to expand the talent supply pipeline and address issues employers experience in finding workers. The collaborative is undertaking initiatives to build awareness of IT and other tech careers in the high schools through internships and other programs, and works regionally to advance innovations in IT education, training, and internships for nontraditional,

[46] Incomplete data was available on the number of community college IT program graduates going into jobs versus pursuing further education and the following assumptions were made: 80% to employment for certificate programs and 35% to 50% for associate degrees, depending on the type of degree.

underserved populations. Through these efforts and plans at existing IT providers, the supply of IT training and graduates is likely to increase over the next ten years.

These programs currently graduate between 964 to 1139 annually with 159 to 206 estimated to be Boston residents entering employment. Based on 40% of these Boston graduates entering jobs at new development projects, the ten-year supply of graduates for jobs in new development projects is estimated at 390 to 620[47].

Combining occupational demand and the low training supply projection, there is ten-year gap of 10 and 100 training seats for the 40% and 50% resident employment scenarios, respectively. Under the high training supply estimate, there is enough capacity to address employer demand and no training supply gap would exist.

Health Care

Massachusetts has experienced a shortage of workers for many health care occupations for over a decade with some studies projecting that workforce shortages in the state could more than triple between 2017 and 2024.[48] The pandemic worsened this shortage as nurses and other workers left the industry and the pipeline of new workers was interrupted due to delays in education, clinical placements and licensing exams[49]. The shortage of health care workers in Boston was confirmed through interviews with a major health care system that reported continued difficulty finding workers and that the capacity of the existing education and training system does not meet existing demand. Health care training providers also indicated that employer demand for their graduates significantly exceeds the current number of graduates. Given this situation, the current training supply may only function to address the existing shortage of health care workers, with linkage funding needed for expand capacity to fill 100% of the occupational demand for entry-level and middle-skill health care jobs generated from new development. This assumption is used to estimate the training gap and costs under the low-supply scenario discussed below.

Occupational Demand

Projected development of new hospital clinical facilities together with expected medical offices and pharmacies in office and lab projects is expected to generate 4,277 new jobs, including 797 technicians and health care support occupations and 1,098 registered nurses. Hospitals largely hire registered nurses with a BSN degree for these jobs. However, with the current nursing shortage, there is the potential for hospitals to change this requirement and hire some applicants with an associate nursing degree (and perhaps assist them to complete their BSN over time). Therefore, the occupational demand analysis includes projecting that 10% of the demand for new RNs (110 jobs) will be accessible for workers with an associate degree. This results in the demand for 907 entry-level and middle-skills jobs from new development, which translates into 457 jobs for Boston residents with 50% resident employment and 363 under 40% resident employment.

[47] These estimates include an adjustment to deduct for training funded by the Neighborhood Jobs Trust with linkage fee revenue.
[48] The Project on Workforce, Covid-19 and the Changing Massachusetts Health Care Workforce, p.7
[49] The Project on Workforce, Covid-19 and the Changing Massachusetts Health Care Workforce, p.8, 13 and 15.

Earnings for health care occupations are mixed. The myriad technician occupations pay fairly well averaging $67,612 annually in 2021, close to the median WDA annual earnings. Registered Nurses in the Boston WDA had a median wage of just over $102,000. Health care support occupations, which include Nursing Assistants and Phlebotomists have significantly lower earnings with average median annual earning of $43,856 in 2021.

Another 548 medical office/administrative positions resulting from new development are addressed as part of office and administrative occupations.

Training Supply

Boston benefits from a large array of health care training programs, with considerable capacity in the local community colleges and non-profit agencies. Several large health care systems also have internal programs to support additional education and training among their workers to move up career ladders. Boston Healthcare Careers Consortium, comprised of healthcare organizations, educational institutions, labor organizations, the public workforce system and others from the City of Boston focuses on identifying and addressing barriers to an aligned and efficient education and training system. This regional partnership works to build career ladders within the health care industry and ensure that healthcare providers have the staff that they need to deliver the best care possible to patients in a culturally competent environment.

Skills training programs within the current system include:

- Extensive certificate and associate degree programs at 7 area community colleges, including Bay State College, BFIT, BHCC, Laboure College, QC, RCC, and the Urban College of Boston. The occupations addressed in these programs include EMT Technician, LPN, Nursing Aid, RN, Physical Therapy Assistant, Phlebotomist, Substance Abuse Counseling, Medical Assistant, Cardiovascular Technician, Electro-neurodiagnostic Technician, Radiology Technician, Sonograph/ultrasound Technician, and Surgical Technician
- Multiple non-profit and private providers providing training primarily geared toward health care support occupations, although some provide training for technician position, e.g., JVS has a Pharmacy Technician program.

The programs generated an estimated 183 annual graduates entering employment who are Boston residents[50]. As noted above, the low-supply estimate assumes this all of this supply goes to address the current shortage of health care workers with none filling jobs at new development. The high-supply estimate assumes 40% of this capacity goes to new development, supplying 72 workers per year or 720 over the ten-year period.

Combining occupation demand and the low training supply projection, there is ten-year gap of 363 and 457 training seats for the 40% and 50% resident employment scenarios, respectively. Under the high training supply estimate, there is enough capacity to address employer demand and no training supply gap would exist.

[50] These estimates include an adjustment to deduct for training funded by the Neighborhood Jobs Trust with linkage fee revenue.

Hospitality

Occupational Demand
Growth in restaurant and hotel employment from new development is projected to create 2,829 new largely entry-level jobs in Food Preparation and Serving and Building and Grounds Cleaning and Maintenance occupations, with 1,312 and 1,415 jobs for Boston residents at 40% and 50% resident hiring, respectively.

Hospitality jobs are among the lowest paying occupations in Boston with 2021 median annual earnings of $31,143 for Food Preparation and Serving occupations and $38,391 the median for Building and Grounds Cleaning and Maintenance occupations. However, earnings at unionized hotels are considerably higher, e.g., the starting hourly pay for a room attendant/housekeeper is $26.67—over $55,000 annually for a full-time position.

Training Supply
Training for hospitality jobs is provided through several BHCC certificate programs, a BPS career and technical education, JVS and other providers approved for ITA vouchers. Best Hospitality is a non-profit organization that trains workers for union hotel jobs in the Boston region[51]. The estimated existing annual supply of graduates from these programs that are Boston residents and go into employment is 37 and 370 over ten years, with 148 of these graduates (40%) projected to fill jobs in new development projects. Since the pandemic reduced recent employment and hiring in the hospitality industry and the level of training, a high-supply estimate was made that assumed a doubling of the annual number of ITA vouchers used for hospitality industry training and a 50% increase at the JVS program. Under this high-supply scenario, the ten-year supply of employed graduates who are Boston residents increases to 450 with 180 working at new developments.

Combining occupation demand and the low training supply projection, there is ten-year gap of 989 and 1,267 training seats for the 40% and 50% resident employment scenarios, respectively. Under the high training supply estimate, the training supply gap is 952 and 1,235 seats for the 40% and 50% resident employment level, respectively.

Administrative and Other Occupations

Occupational Demand
An additional 4,438 jobs in occupations not requiring a bachelor's degree are expected to be generated by new development projects over the next ten years. Office and administrative occupations account for 68% of these jobs inclusive of 2,488 non-medical and 547 medical office and administration positions. The remaining 1,342 jobs are in other occupations including sales, repair and maintenance, production and transportation/material moving. Estimated employment for Bostonians in these occupations is 1,751 and 2,189 for 40% and 50% resident employment, respectively.

Training Supply

[51] Since Boston residents trained by Best Hospitality are funded through the Neighborhood Jobs Trust and linkage funding, its graduates are not included in the figures for existing system supply.

Multiple programs provide training for these additional occupations, primarily for office and administrative positions, including at BHCC certificate programs, several non-profit agencies (JVS, Operation Able, the YMCA) and other providers approved for ITA vouchers. These programs currently supply an estimated 76 annual graduates who enter employment and are Boston residents, or 760 over ten years, with 300 (40%) assumed to be in jobs at new development projects. Under the high-supply estimate, with increases in annual ITAs and expansion at non-profit training providers, the ten year supply of Boston residents entering employment is 1,050 over ten years, of which 420 are expected to fill jobs at new development projects.

Median earnings within these occupational groups are well below the overall median for the Boston WDA. Production and Transportation/Materials Moving jobs have the lowest earnings, with the 2021 median annual pay at $37,939 and $38,415, respectively. Median annual earnings for Sales and Office/Administrative occupations are higher at over $48,000. Moreover, there are positions within these two occupational groups with considerably higher median annual pay. Examples include:

- Executive Secretaries/Administrative Assistants: $73,761;
- Legal Secretaries and Administrative Assistants: $67,631;
- Financial Clerks, All Other: $62,720;
- Brokerage Clerks: $61,525;
- Advertising Sales Agents: $61,518;
- Insurance Sales Agents: $78,811; and
- Sales Representatives, Wholesale and Manufacturing Products: $77,882.

Combining occupation demand and the low training supply projection, there is a ten-year gap of 1,451 and 1,899 training seats for the 40% and 50% resident employment scenarios, respectively. Under the high training supply estimate, the training supply gap is 1,331 and 1,769 seats for the 40% and 50% resident employment level, respectively.

Skills Training Fund Gap

Table 6-4 summarizes the skills training supply gap by industry/occupational area and the required funding amount to address these gaps under 40% resident employment. The total funding gap is $17.2 million under the high-supply scenario and $24.2 million under the low-supply estimate. The funding gap for 50% resident employment is $23.5 million under the high-supply estimate and $32 million with the low-supply estimate (see **Table 6-5)** The per participant training costs used to calculate the required funding levels, based on averages for existing programs, are shown in **Table 6-3.**

Table 6-3. Occupational Skills Training Costs

Training Industy/Occupation	Cost per Participant
Life Science	$19,000
Information Technology	$7,500
Health Care Technicians	$12,557
Health Care Support	$6,000
Hospitality	$5,800
Office/Administrative and Other Occupations	$7,000

Source: Karl F. Seidman Consulting Services

Table 6-4. Occupational Training Supply Gap and Costs by Industry Sector, 40% Resident Employment

Sector	Ten-Year Training Positions Needed	Existing Training Supply - Low	Existing Training Supply - High*	Gap: Low Supply	Gap: High Supply	Funding Gap at Low Supply	Funding Gap at High Supply
Life Science	328	70	204	258	124	$4,902,000	$2,356,000
Information Technology	400	390	630	10	0	$75,000	$0
Health Care	363	0	720	363	0	$3,346,920	$0
Hotel/Restaurants	1,132	148	180	984	952	$5,707,200	$5,521,600
Office/Admin/Other	1,751	300	420	1,451	1,331	$10,157,000	$9,317,000
Total	3,974	908	1,567	3,066	2,407	$24,188,120	$17,194,600
*Total excludes IT & health care supply in excess of needed training							

Source: Karl F. Seidman Consulting Services

Table 6-5. Occupational Training Supply Gap and Costs by Industry Sector, 50% Resident Employment

Sector	Ten-Year Training Positions Needed	Existing Training Supply - Low	Existing Training Supply - High*	Gap: Low Supply	Gap: High Supply	Funding Gap at Low Supply	Funding Gap at High Supply
Life Science	410	70	204	340	206	$6,460,000	$3,914,000
Information Technology	500	390	630	110	0	$825,000	$0
Health Care	457	0	720	457	0	$4,116,500	$0
Hotel/Restaurants	1,415	148	180	1,267	1,235	$7,348,600	$7,163,000
Office/Admin/Other	2,189	300	420	1,889	1,769	$13,223,000	$12,383,000
Total	4,971	908	1,761	4,063	3,210	$31,973,100	$23,460,000
*Total excludes IT & health care supply in excess of needed training							

Source: Karl F. Seidman Consulting Services

Additional Employment and Training Services

ESOL and ABE Education

Part of the Boston labor force faces language and educational barriers to skills training and to accessing the job opportunities generated by new development. Funding and delivering these services is closely aligned with the goals for the jobs linkage policy and the Neighborhood Jobs Trust. The need for ESOL education services was based on the percentage of unemployed who do not speak English well based on data from the 2016 to 2020 5-year American Community Survey, which is 11.4%. This percentage was applied to the 4,971 needed training positions to yield an estimate of 567 ESOL seats. The cost to provide this level of ESOL education is $1,927,800, based on a cost of $3,400 per participant[52].

Two estimates were prepared for the cost of needed Adult Basic Education services. The low estimate assumes 15.3% of trainees (761) will lack a high school diploma, based on the share of Boston's unemployed workers without a high school education from the 2016-2020 American Community Survey. A high estimate is based on 21.5% of trainees (1,069) needing ABE services, assuming that one-quarter of trainees with a high school diploma or its equivalent will lack high school level competency and thus will need educational services to reach this skill level. Based on a $3,500 average cost per participant, the required funding for ABE services is $2,663,500 and $3,741,500 for the low and high estimate, respectively.

Skills Upgrading and Training Stipends

As noted above, many of the projected jobs, particularly in entry-level positions, at new development projects pay wages well below the citywide median annual earnings of $68,973 and below the estimated Suffolk County living wage of $74,069 for a four-person household with two working adults[53]. To address this situation, the Neighborhood Jobs Trust can fund skills upgrading and career advancement training for workers after they are employed at new development projects. Based on Massachusetts' industry occupational distributions, there are 2,421 entry-level jobs not requiring a college degree for the 40% Boston resident employment scenario and 3,030 under the 50% resident scenario. The estimated cost to provide skills upgrading training for these employed workers is $4.3 million and $5.4 million, respectively, based a cost per worker of $1,788[54].

Participation in education and skills training programs entails a loss of income for trainees for the time required to attend training. Some programs, particularly in the health care field, have a required number of workplace externships to obtain certification that are typically uncompensated. This loss of income is a major barrier to obtaining skills training, particularly for the low-income and moderate-income workers targeted by the jobs linkage policy, who critically need this income to cover the living expense during training. The estimated cost to provide a single training stipend is $4,412 based on an average training program period of 271 hours for non-apprenticeship training

[52] This costs for ESOL and ABE services are based on the average cost per participant in FY2023 as funded by the Massachusetts Department of Elementary and Secondary Education (DESE), rounded to the nearest hundred dollars.
[53] From the MIT Living Wage Calculator (https://livingwage.mit.edu/counties/25025).
[54] This cost estimate is the average cost for incumbent worker skills training funded by the Massachusetts Commonwealth Corporation's Workforce Training Fund in FY2021.

programs[55] and an hourly rate of $16.28—Boston's current living wage standard for vendors. Since most life science training programs and some IT training programs already pay a stipend, the cost estimate for stipends excludes all life science training seats and 20% of IT training seats to avoid double counting stipend costs for these programs. **Table 6-6** summarizes stipend cost estimates under the different scenarios, which range from $10.1 million to $16.3 million.

Providing stipends to trainings can have unintended consequences when the stipend income results in increased tax liabilities and/or loss of social safety net benefits if the trainees income with the stipend exceeds program income limits. The City of Boston will need to evaluate and consider these potential impacts before deciding on policies related to funding stipends through linkage and the Neighborhood Jobs Trust, including whether either existing program regulations or new regulatory changes can exclude training stipend income from income limits.

Table 6-6. Estimated Cost for Training Stipends under Different Scenarios

Training Supply Scenario	40% Resident Employment	50% resident employment
	Number of Stipends	
High supply training scenario	2,283	3,004
Low supply training scenario	2,799	3,701
	Stipend Cost	
High supply training scenario	$10,072,596	$13,253,648
Low supply training scenario	$12,349,188	$16,328,812

Source: Karl F. Seidman Consulting Services

Total Job Training Funding Gap and Warranted Jobs Linkage Fee

The total funding gap and associated linkage fee to address the combined employment and training needs for entry-level and middle-skill jobs at the projected new development under the 40% resident employment scenario are summarized in **Table 6.7.** Excluding the cost for stipends, the gap is $25.2 million under the high training supply estimate and $33 million for the low training supply estimate. These translate into PSF linkage fees of $2.26 and $2.96 using a basis of 11,611,000 square (total projected development of 14,861,000 SF less 3,700,000 in exempt space[56]). When stipends are included the jobs linkage fee increases to $3.16 and $4.07 for the high training supply and low training supply scenarios, respectively.

[55] Apprenticeship programs were excluded as participants are typically paid during the non-classroom work portion of the program and the breakdown of hours for classroom vs. work portions of these programs was not available.
[56] The exemption amount assumes 37 development projects with an average gross floor area of 400,000 SF.

Table 6-7. Total Funding Gap and Jobs Linkage Fee, 40% Resident Employment

Type of Service	High Training Supply Estimate	Low Training Supply Estimate
Skills Training	$17,194,600	$24,188,120
ABE/ESOL	$3,668,200	$4,529,200
Career Advancement	$4,328,748	$4,328,748
Total	$25,191,548	$33,046,068
PSF Jobs Linkage Fee	$2.26	$2.96
Training Stipend	$10,072,596	$12,349,188
Total with Stipend	$35,264,144	$45,395,256
PSF Jobs Linkage Fee with Stipend	$3.16	$4.07
Current Exaction	$2.39	$2.39

Table 6-8 details the funding gap and linkage fee levels for the 50% resident employment scenario. Without stipends, the gap is $33.8 million under the high training supply estimate and $43.7 million for the low training supply estimate. These translate into PSF linkage fees of $3.00 and $3.86 using the basis of 11,611,000 square feet of projected new development subject to linkage fees. When stipends are included the jobs linkage fee increases to $4.19 and $5.32 for the high training supply and low training supply scenarios, respectively.

Table 6-8. Total Funding Gap and Jobs Linkage Fee, 50% Resident Employment

Type of Service	High Training Supply Estimate	Low Training Supply Estimate
Skills Training	$23,460,000	$31,973,100
ABE/ESOL	$4,591,300	$5,669,300
Career Advancement	$5,417,640	$5,417,640
Total	$33,818,940	$43,730,040
PSF Jobs Linkage Fee	$3.00	$3.86
Training Stipend	$13,474,248	$16,655,300
Total with Stipend	$47,293,188	$60,385,340
PSF Jobs Linkage Fee with Stipend	$4.19	$5.32
Current Exaction	$2.39	$2.39

VII. Review of Linkage Fee Policy Options

Cities across the country have implemented linkage policies to generate funding to address the impact of commercial development on affordable housing demand for over three decades—from several California cities to Denver and Seattle, and communities in Florida and New Jersey. Locally, Boston and Somerville have implemented housing and jobs linkage fees, and Cambridge has a housing linkage fee. Watertown and Chelsea also recently submitted home rule petitions to establish linkage fees, with Watertown's proposed fee dedicated to affordable housing and Chelsea's fee applicable to multiple purposes. This section reviews the linkage fees in nearby communities and several cities nationwide, considers several changes to Boston's current linkage policies, and assesses the impact of changes to the city's linkage fee rate on the financial returns and feasibility of future commercial development.

Linkage Fee Policies in Other Communities

Current linkage fee rates and policies for Boston, Cambridge, Somerville and several comparable national cities are summarized in **Table 7-1**. Housing linkage fees range from under $1.00 per SF for some uses in Denver, San Diego and San Jose to a high of $69.80 for some office projects in San Francisco. Locally, Boston's combined Housing and Jobs fee rate of $15.29 is below that of Cambridge ($33.34) and above Somerville ($13.98). Cambridge recently raised its fee to $33.34 and Somerville is currently undertaking a Nexus Study that may result in rate changes over the next several months. Nationally, Boston's rate is above that for Denver and San Diego but below the highest rates in San Jose ($15.79) and Seattle ($25.30). All four of these cities vary linkage fees by use, and all except San Diego also vary rates by location, so some projects in San Jose and Seattle face lower rates than in Boston. San Francisco has the highest rates by far, with lab projects between $31 and $39 and office projects over 50,000 SF paying almost $47 to just under $70 per SF.

Boston differs from other cities in having the highest project size threshold to trigger linkage payments (San Jose has a 100,000 SF threshold for projects in some districts) and the largest exemption, both at 100,000 SF. Providing an exemption for some amount of space is not common among the comparison cities—present only in Boston, Cambridge[57], Somerville and Seattle. A single full payment of linkage obligations is the most common payment schedule, typically prior to issuance of the building permit or certificate of occupancy. Boston and Somerville are the only cities that allow payment over multiple years. However, San Diego allows application for a two-year deferral and San Jose provides a 20% discount for early payment prior to the final building inspection date. All comparison cities, except San Jose, provide for annual inflation adjustment tied to the CPI or other index.

[57] Cambridge recently added a 30,000 SF exemption for projects of 60,000 SF of less and for rebuilding of existing space without a change of use over a three-year period.

Table 7-1 . Linkage Fee Policies in Boston and Other Cities

City	Year Established	Exaction/Linkage Fee Rate (per SF)	Project Size Threshold (SF)	Exemption (SF)	Payment Schedule	Rate Adjustments	Other Policies
Boston	1983	Housing: $13.00	100,000	100,000	Housing: Downtown district: 5 payments at building permit date & 4 anniversary dates; elsewhere: 7 payments at COO date & 6 anniversary dates	Automatic annual adjustment based on a "combined index" of the CPI for Urban Consumers and CPI Housing Component. At other times as recommended by the BRA based on a consideration of economic trends, housing trends and other factors.	Housing creation option allows a developer to make all or a portion of their linkage obligation via a financial contribution to a specific income restricted housing project.
	1986	Jobs: $2.39			Jobs: two payments at building permit date & one-year anniversary		Job linkage obligation can be met through either cash payments or creation of a job training program with a cost at least equal to the required linkage fee contribution.
Cambridge	1988	Housing: $33.34	30,000	30,000 for projects with 60,000 SF or less & the rebuilding of existing space without a change of use	One payment at COO	Annual Adjustment (in October or November) based on Boston CPI Housing Index Recalculation after three years or longer.	
Somerville	1990	Housing: $11.23	30,000 for housing and jobs fees	30,000 for housing	Housing fee made in three payments at COO & next two anniversary dates. Jobs fee made in two payments at building permit & COO	Reevaluation every five years. Annual adjustment March 1 based on Boston CPI.	
	2017	Jobs: $2.75	15,000 for jobs	15,000 for jobs			
Denver, CO	2017	.96 to 3.65 depending on use (7/1/2022) and market area for some uses; annual scheduled increases to $2.50 to $9.00 in 2025.	None	None	One payment before building permit issuance	Annual adjustment based on change in CPI for Urban Consumers.	Applies to housing project with 9 or fewer units; lowest fees for industrial uses; highest for commercial, civic, public and institutional uses in high market area.
San Diego	1990	.80 to 2.12 PSF depending on use	None	None	One payment prior to building permit; can apply for 2 year deferral	No automatic inflation adjustments.	Exemptions for projects in Enterprise Zone, with certain 1st source hiring agreements & with primary uses that include manufacturing wholesale, and urgent care, hospitals, intermediate care & nursing homes.
San Francisco	1996	Fees vary by use, size and date of permit application. Highest fees are for office projects > 50,000 SF and range from $46.98 to $69.60. Lab fees range from $31.43 to 38.37.	Increase by 25,000 SF or more by any combination of entertainment, hotel, office, laboratory, retail, and/or Small Enterprise Workspace		Prior to certificate of occupancy	Annual adjustment per changes in the Annual Infrastructure Construction Cost Inflation Estimate prepared by City's Capital Planning Group.	Free-standing pharmacies <50.000 SF and grocery stores <75,000 SF are exempt.
San Jose	2020	Fees vary from 0 to $15.79 by use, location in one of four districts and timing of payment. Highest fee for downtown office use.	Office & Industrial R&D above 50,000 or 100,000 for some districts	None	By final building inspection date; 20% discount if paid before building permit	Annual adjustment per changes in the Engineering News Record (ENR) Construction Cost Index.	
Seattle	2015	Fees vary by detailed development zone within the downtown/SM-SLU/SM-U 85 area vs. outside, by commercial vs. residential use, & date vested in Land-use code. Commercial rates range from $9.76 to $25.30.	4,000 SF for commercial uses	4,000 SF; may vary by zone	Prior to master use permit or building permit	Annual CPI adjustment.	Applies to any project with rezoning that increases the maximum height or floor area ratio (FAR), or establishes a different zoning designation.

Source: Karl F. Seidman Consulting Services

Administrative and Policy Issues

Beyond updating the housing and jobs linkage fee rate, Boston may want to consider updating several administrative and policy issues related to these fees. The key issues reviewed in this section, are:

- Changing the current 100,000 SF project size threshold;
- Changing the current 100,000 SF exemption for determining the gross floor area for which the fee is applied;
- Changing the current multi-year payment schedule; and
- Altering the current single uniform fee rate by use and/or development district.

Size Threshold and Exemption.
Communities vary in the size threshold that triggers the application of housing contributions or linkage fees. As noted above, Boston has the highest threshold at 100,000 SF compared to Cambridge and Somerville. Denver and San Diego have no minimum size threshold for the application of commercial linkage fees and collect them from projects independent of size.
Boston's larger threshold reflects the larger size of development projects in the city, which average over 400,000 SF over the past decade, compared to average project sizes close to 270,000 in Cambridge and 200,000 SF in Somerville.

One option is reducing the linkage fee threshold to 50,000 SF to be consistent with the trigger for large project review under Article 80 of the Zoning Code. Based on BPDA data, there were 37 projects completed between 2011 and April 2022. with uses subject to linkage fees between 50,000 and 100,000 SF totaling 2.8 million SF of new development. This equals 22% of the completed development for projects over 100,000 SF subject to linkage over the period total development. Any increase in linkage revenues from lowering the threshold would be less than 22% since it will depend on the change in the exemption level, which will reduce the actual SF subject to linkage for the smaller projects and increase the linkage fee base and revenue for larger projects. One consideration in reducing the project threshold is the impact that imposing linkage fees would have on project economics and feasibility. Although linkage fees constitute a small share of development costs and typically do not impact feasibility, smaller projects face more challenging economics as they have less space and rental income to recoup fixed costs for land and other fixed expenses that do not vary with project size. Smaller projects also tend to be located in neighborhoods outside Boston's high rent districts, and thus rely on lower SF rents to achieve feasibility. Twenty-one, or 57%, of the 37 projects between 50,000 and 100,000 SF were located in Boston neighborhoods outside the city's major development districts including Allston (3), Brighton (3), Dorchester (2), East Boston, Hyde Park, Mattapan (3), Mission Hill, Roxbury (3), and the South End (4).

Boston currently exempts the first 100,000 SF of a project from the base used to determine linkage fees. The exemption reduces a project's linkage payments but increases the fee level needed to raise a given amount of linkage funding. There is not a strong policy case for having an exemption since the exempted space generates employment that affects the demand for affordable housing and job training. The exemption does serve to shift the overall cost of linkage payments from

smaller to larger projects, which may help enhance project returns and feasibility for projects close to the 100,000 SF threshold.

Payment Timing Schedule.
Boston's current multi-year payment schedule adds complexity and cost to linkage fee administration. Jobs linkage is paid in two installments and housing payments are made in five or seven installments depending on whether a project is located inside or outside the designated Downtown District. The first payment date also differs between jobs linkage and housing linkage in the Downtown District (building permit date) and housing linkage outside the Downtown District (certificate of occupancy date). Multiple payments create administrative complexity since additional record-keeping, invoicing and collection efforts are needed to track and collect payments over multiple years. The extended payment periods also slow the receipt of linkage revenue and the City's ability to deploy funds for affordable housing and job training.

There is a financial benefit to developers in extending the payments over time but this benefit does not have much impact on developer returns and is not realized by all developers. To compare the financial value of the extended payment period, the present value of payments over five-year and seven-year periods were compared to a single payment using a discount rate of 6.5% based on a $20 fee increase and average project of 400,000 SF. This increase made as a single payment is $6 million. The present value with payments over five years is $5,310,958—a $689,042 reduction. Discounted over seven years, the present value is $5,006,583- a savings of $993,417. When these saving are applied to the total development costs to calculate their impact on a developer's return on cost, the impact is very small—increasing returns by less than 2 basis points, or 2/100ths of a percentage point (see **Table 7-2**).

Table 7-2. Impact of Multi-Year Linkage Payments on Developer Return on Cost

Development Project	Single Payment	5 Year Payment	7 Year Payment
Office Development at $1000 PSF	6.384%	6.395%	6.400%
Lab Development at $1200 PSF	7.361%	7.372%	7.376%

Variation of Housing and Employment Impacts by Use.
Boston may want to consider varying linkage payments by use for two reasons: (1) differential impacts on the demand for affordable housing and job opportunities for low- and moderate-income workers; and (2) differences in project economics and financial returns by primary use. Three primary factors influence how affordable housing and job impacts vary by use: (1) the density of employees in the occupied space; (2) the share of employees with earnings at the low-, moderate- and middle-income levels; and (3) the share of jobs in occupations not requiring a college degree. The first two factors impact the need for affordable housing and housing linkage fees while the first and third factors shape the job opportunities and training needs for low- and moderate-income workers and thus, the jobs linkage fee. **Table 7-3** summarizes how these factors vary across the six projected uses for future development in Boston

Restaurants have the greatest impacts related to affordable housing and jobs linkage since they have the highest employee density, the largest share of jobs that pay annual wages below a middle-income level and almost all (97%) of restaurant jobs do not require a college degree. Hotels have a low impact due to their very low employee density. While hotels have a high share of jobs below

the middle-income level and that do not require a college degree, the fact that they create so few jobs per 1,000 SF of development mitigates their overall impact. Office uses have the second highest employee density but also the second lowest share of jobs paying below middle-income wages and not requiring a college degree—both reducing the impact of their relatively high density. Lab, institutional, and retail/personal services use have similar employee densities, but lab uses have a lower impact on the demand for affordable housing with the lowest share of jobs paying below the middle-income level. Lab use, with only 11% of job opportunities not requiring a bachelor's degree and low employee density also have a low impact in terms of generating jobs that do not require a college degree but also have a low supply of skills training for these jobs, which requires more linkage funding to address the training supply gap.

Table 7-3. Factors Affecting the Impact on Housing Demand by Use

Use	Employees per 1,000 SF	Percent of Jobs with Annual Wages at Low, Moderate and Middle-Incomes	Percent of Jobs Not Requiring a Bachelor's Degree
Lab	2.22	69%	11%
Office+	3.33	80%	27%
Hotel	.5	92%	90%
Institutional+	2.13	89%	35%
Restaurant	8	97%	97%
Retail/Personal Services+	2.12	95%	69%

Source: Karl F. Seidman Consulting Services
+ Weighted average for industries within use category *Estimated base on occupational group

As shown in the section below on the impact of fee increases on project economics, there are large differences in the financial returns between lab, office and hotel development projects—the primary uses in for-profit commercial development projects in Boston. Lab projects generate the highest returns to developers, estimated at 6.4% to 7.5%, due to the strong demand and high rents for lab space. Office projects generate lower returns, estimated at 5.4% to 6.5%, with projects at the high end of development costs not financially feasible based on required developer returns. Hotel projects are generally not feasible as they generate too little net income under current market condition to repay debt and support investment. Thus, based on financial feasibility considerations, a higher linkage fee is warranted for lab projects.

Based on impact and the financial capacity to pay higher fees, there is a case for varying the linkage fees by use. However, transitioning from a single fee level to varying linkage fees by use will add administrative complexity and require thinking through the associated definitions and policies. For example, how will mixed-use buildings be treated? Many life science firms combine office and lab uses, which can be interspersed in the same floor, making it difficult to calculate floor area for each use. This might be dealt with by setting the fee based on the primary use. Another issue is that a building's intended or actual use may change over the development process, e.g., a building might be approved and built for lab use but actually leased to office tenants based on market conditions and tenant interest. Similarly, actual uses for ground floor space in mixed-use commercial building may differ from initial planes and often change over time. Boston could

address this issue by basing the linkage fee on the initial use. However, this might create inequitable results between buildings with long-term stable use and those for which uses change more often.

Variation of Contribution Rates by District

Market demand and rent levels vary by neighborhood in Boston, which impacts the financial return on development across different parts of the city. **Table 7-4** shows average asking office rents in several Boston neighborhoods during the 2nd quarter of 2022. There is considerable variation in rents with the highest rent locations 60% to 75% above the lower rent districts. Although these figures may overstate the differences as they likely reflect differences in building quality and age, rent differences by neighborhoods for comparable buildings exist. Since the capacity to support additional costs is related to the rental income that a project can generate, there is a case for varying housing and employment contributions for lower and higher rent development districts. Several cities including Denver, San Jose and Seattle use this approach, varying their affordable housing impact fees by development zone. On the other hand, property acquisition costs are impacted by expected rents and, therefore, likely are lower for lower rent neighborhoods, helping to offset feasibility challenges from lower rents. Varying fees by district or neighborhood would add administrative and policy complexity to linkage fees, particularly around determining appropriate district boundaries and fee variations that accurately reflect differences in projected financial returns.

Table 7-4. Office Rents by Boston Neighborhood, 2022 Second Quarter

Neighborhood	Average Office Asking Rent
Central Business District	$77.08
Back Bay	$74.25
Seaport	$71.30
Fenway/Kenmore	$85.00
North Station/Waterfront	$77.49
Midtown	$48.35
South Station	$55.20
Charlestown/East Boston	$49.91
Dorchester/South Boston	$48.69
Allston/Brigton/Longwood	$51.43

Source: CBRE Downtown Boston Office Report, Q2 2022

Impact on Linkage Fee Increases on Development Economics

An important consideration in establishing the housing and job linkage fees is its potential impact on attracting future development and tenants. An increase in linkage fees will increase development costs. Developers can offset this additional cost by either paying less for their development site, reducing other development costs or collecting higher rents from tenants. When developers are unable to offset the added costs, e.g., if they acquired their site before the linkage fee was increased or market conditions prevent them from increasing rents, the higher costs will reduce the return on investment for the developer and its investment partners. Since the impact of a new linkage fee on the economics of development is not certain and can vary under different

circumstances, this section analyzes three ways in which a linkage fee may affect Boston's competitive position for future development:

1. The cost of the linkage fee is passed on to tenants as higher rents. If the rent increase is large, then it may affect Boston's competitiveness in attracting businesses to new development projects.
2. The linkage fee cost is fully paid by developers without any rent increase or offsetting reduction in acquisition or other development costs. With higher development costs and the same rental income, developers will experience a reduction in their financial return for the project. Many developers have a return threshold that a project must meet to be deemed financially feasible and to be undertaken. If the added cost of the linkage fee significantly reduces the financial return, developers may forego undertaking a project in Boston and pursue opportunities in other communities. A developer's return on cost[58], a common financial return measure that developers use to assess project feasibility, is used for this analysis to assess the potential impact of linkage fee increase options for lab, office and hotel development projects.
3. The linkage fee cost is fully paid by the project's equity investors without the added cost either passed on as a rent increase, offset by lower acquisition and/or other development costs, or funded with an increase in debt financing. Developers need to raise equity financing to cover the portion of project costs that cannot be financed with debt. If the full cost of the linkage fee must be financed by equity[59], it will reduce the equity investors' return on investment since they must provide more capital but the project's income will not increase. If the cost of the linkage significantly reduces their investment return, then equity investors may choose not to invest in Boston projects. The inability to raise sufficient equity investment may prevent some developers from being able to undertake projects and reduce future development and investment in Boston.

Potential Impact on Rents

Table 7.5 shows the dollar and percentage impact on Boston lab and office rents for linkage fee increases ranging from $5 to the maximum warranted increase of $70.13[60]. The maximum fee, when fully passed on to tenants, would increase annual rent by $7.01 per SF—a 6.5% to 8.8% increase depending on property type and location. Potential rent increases are modest at $1 and 1.3% or less under a $5 or $10 linkage fee increase and slightly higher at $2 or up to 2.5% with a $20 increase. With the exception of the maximum fee increase, these potential rent increases are small when compared to the large growth in lab rents during recent years and current rates of inflation.

[58] Return on cost is the ratio of a project's net income to its total development costs.

[59] This result is likely since without an increase in a project's rent and net cash flow, lenders are unlikely to increase the amount of debt they will provide.

[60] This is based on increasing the housing fee to $80.20 and the jobs fee to $5.32

Table 7-5. Impact of Linkage Fee Options on Boston Rents

Linkage Fee Level	Potential Impact on Annual Per Square Foot Rent*	Percent of Boston Class A Office Rent	Percent of Seaport Class A Lab Rent	Percent of Longwood/Fenway Class A Lab Rent
$5 per square foot	$0.50	0.6%	0.5%	0.5%
$10 per square foot	$1.00	1.3%	1.0%	0.9%
$20 per square foot	$2.00	2.5%	1.9%	1.9%
$70.13 per square foot	$7.01	8.8%	6.7%	6.5%
*Fee cost amortized over a 10 year lease				

Source: Karl F. Seidman Consulting Services

To assess the impact of these potential rent increases on Boston's competition for tenants, **Table 7-6** compares lab rents on Boston's two largest lab development areas with key competing locations: East and West Cambridge, the 128-West market area (which includes Waltham and Lexington) and Watertown. Boston's lab rents are higher than all the competing areas, and exceed East Cambridge, with which it has a lower differential of $17 to $20 dollars PSF. Since Boston provides a lower cost alternative to East Cambridge, it is important to maintain this rent differential. A linkage fee increase in the area of $20 or less, even if fully passed on to tenants, would allow Boston rents to remain close to $15 PSF below those in East Cambridge.

Table 7-6. Class A Lab Rents in Boston and Key Competing Market Areas

Location	Class A Lab Asking Rent	Differential from Seaport	Differential from Longwood/Fenway
Boston Seaport	$105		
Boston-Longwood/Fenway	$108		
East Cambridge	$125	$20	$17
West Cambridge	$95	-$10	-$13
128-MassPike	$85	-$20	-$23
Watertown	$100	-$5	-$8

Source: CRESA Greater Boston Life Science 2022 Market Insight Report & CBRE Boston Metro Lab Report 4Q21

Similar to the lab market, Boston Class A office rents exceed those in all competing markets except East Cambridge and Mid-Cambridge (see **Table 7-7**). Boston is a unique location with important competitive advantages including extensive public transportation options, rich amenities for employees and proximity to a wealth of business and professional services. These advantages make Boston less likely to compete with other locations based on price and less sensitive to increases in rent differentials, particularly for tenants seeking high quality Class A space found in new developments. Given Boston's competitive position, any rent increase passed on to tenants from linkage fee increases of $20 or less is unlikely to impact the city's competitiveness in attracting and retaining office tenants. The maximum linkage fee increase of $70.13, %, if fully passed on to tenants as a rent increase, would erase Boston's rental differential with Mid-Cambridge and increase its rent premium over West Cambridge by 35% and over the 128/Mass Pike area by 205, and thus has a greater potential to impact tenant location decisions.

Table 7-7. Class A Office Rents in Boston and Key Competing Market Areas

Location	Class A Office Asking Rent	Differential from Boston
Boston	$80	
East Cambridge	$106	$26
Mid-Cambridge	$85	$5
West Cambridge	$60	-$20
128 Mass Pike	$44	-$36

Source: JLL Boston Office Insight Q2 2022

Impact of Developer Returns

Tables 7-8 and Table 7-9 show the estimated impact of linkage fee increases, ranging from $5 to $70.13 on development costs and developer returns for lab and office development projects, respectively. This analysis is based on an average size project of 400,000 SF of gross floor area and under high- cost and low-cost development scenarios. Based on interviews with ten developers, most return- on-cost investment thresholds are in the 6 to 7% range.

Under the maximum $70.13 fee increase, development costs increase by $21.039 million. This added cost reduces the return on cost for the lab project from 6.39% to 6.16%--a decline of 23 basis points[61] for the high cost scenario and from 7.43% to 7.14% (a 31 basis point decline) for the low cost scenario. This level of increase is unlikely to prevent lab projects at the lower development cost level from going forward but could make some projects with high development costs of $1400 PSF infeasible, since they are currently at the low end of return thresholds without a fee increase. For office developments, only projects at $1000 PSF meet developers' return thresholds and are feasible. A $70.13 fee increase would reduce the return on cost for this project by 32 basis points from 6.48% to 6.16%, potentially making some projects infeasible.

Fee increases in the $5 to $20 range have modest impacts on developer returns, reducing them between 2 and 10 basis points. This level of change in developer returns is unlikely to make a project infeasible and prevent its development—a developer willing to undertake a project with a 6.4% or 7.5% return is likely to still view the project as viable at a 6.3% or 7.4% return.

[61] A basis point is 1/100th of a percentage point.

Table 7-8. Estimated Impact of Linkage Fee Increase Options on Lab Development Costs and Developer Returns

Lab Development at $1400 PSF	No Fee Increase	$5 Fee Increase	$10 Fee Increase	$20 Fee Increase	$70.13 Fee Increase
Total Development Costs	$560,000,000	$561,500,000	$563,000,000	$566,000,000	$581,039,000
Estimated Gross Rental income	$37,350,000	$37,350,000	$37,350,000	$37,350,000	$37,350,000
Vacancy	$1,575,000	$1,575,000	$1,575,000	$1,575,000	$1,575,000
Net Rental Income	$35,775,000	$35,775,000	$35,775,000	$35,775,000	$35,775,000
Return on Cost	6.39%	6.37%	6.35%	6.32%	6.16%
Differential		**-0.017%**	**-0.034%**	**-0.068%**	**-0.231%**
Lab Development at $1200 PSF					
Total Development Costs	$480,000,000	$481,500,000	$483,000,000	$486,000,000	$501,039,000
Estimated Gross Rental income	$37,350,000	$37,350,000	$37,350,000	$37,350,000	$37,350,000
Vacancy	$1,575,000	$1,575,000	$1,575,000	$1,575,000	$1,575,000
Net Rental Income	$35,775,000	$35,775,000	$35,775,000	$35,775,000	$35,775,000
Return on Cost	7.45%	7.43%	7.41%	7.36%	7.14%
Differential		**-0.023%**	**-0.046%**	**-0.092%**	**-0.313%**

Source: Karl F. Seidman Consulting Services

Table 7-9. Estimated Impact of Linkage Fee Increase Options on Office Development Costs and Developer Returns

Office Development at $1200 PSF	No Fee Increase	$5 Fee Increase	$10 Fee Increase	$20 Fee Increase	$70.13 Fee Increase
Total Development Costs	$480,000,000	$481,500,000	$483,000,000	$486,000,000	$501,039,000
Estimated Gross Rental income	$28,800,000	$28,800,000	$28,800,000	$28,800,000	$28,800,000
Vacancy	$2,880,000	$2,880,000	$2,880,000	$2,880,000	$2,880,000
Net Rental Income	$25,920,000	$25,920,000	$25,920,000	$25,920,000	$25,920,000
Return on Cost	5.40%	5.38%	5.37%	5.33%	5.17%
Differential		**-0.017%**	**-0.034%**	**-0.067%**	**-0.227%**
Office Development at $1000 PSF					
Total Development Costs	$400,000,000	$401,500,000	$403,000,000	$406,000,000	$421,039,000
Estimated Gross Rental income	$28,800,000	$28,800,000	$28,800,000	$28,800,000	$28,800,000
Vacancy	$2,880,000	$2,880,000	$2,880,000	$2,880,000	$2,880,000
Net Rental Income	$25,920,000	$25,920,000	$25,920,000	$25,920,000	$25,920,000
Return on Cost	6.48%	6.456%	6.43%	6.38%	6.16%
Differential		**-0.024%**	**-0.048%**	**-0.096%**	**-0.324%**

Source: Karl F. Seidman Consulting Services

Table 7-10 shows the estimated impact of linkage fee increases from $5 to $70.13 on development costs and developer returns for a hotel development under average occupancy and room rates and operating costs in the current market. This analysis is based on an average size hotel project with 200,000 SF of gross floor area with an occupancy rate, room rental rate and operating cost under current market conditions. It is for a hotel without meeting, conference and catering facilities and revenue. In the current market environment, this type of hotel project is not viable, as the net income provides a return on cost below 1% and is too low to cover debt service costs and attract investor equity. Occupancy rates and room rates will need to increase considerably for most hotel projects to be financially feasible. In this situation, market conditions, not linkage fees, are the critical barrier to new hotel development. Nonetheless, the added development costs under all the fee increase scenarios reduces the projected return on cost, although the impact is small. Returns

drop from 0.919% with no fee increase to 0.917% (.2 basis points) with a $5 increase and to 0.888% (3.1 basis points) under a $70.13 increase.

Table 7-10. Estimated Impact of Linkage Fee Increase Options on Hotel Development Costs and Developer Returns

Hotel Development at 1000/SF	No Fee Increase	$5 Fee Increase	$10 Fee Increase	$20 Fee Increase	$70.13 Fee Increase
TDC	$200,000,000	$200,500,000	$201,000,000	$202,000,000	$207,013,000
Total Revenue*	$19,152,152	$19,152,152	$19,152,152	$19,152,152	$19,152,152
Total Operating Expenses+	-$17,313,546	-$17,313,546	-$17,313,546	-$17,313,546	-$17,313,546
Net Income before Debt Service	$1,838,607	$1,838,607	$1,838,607	$1,838,607	$1,838,607
Return on Cost	0.919%	0.917%	0.915%	0.910%	0.888%
Differential		**-0.002%**	**-0.005%**	**-0.009%**	**-0.031%**
* Room revenue at $130 REVPAR plus other revenue at 5% of room revenue					
+ Department costs at 45% of revenue, other operating costs @26% ,franchise costs @3%, taxes, insurance & reserves @16%					

Source: Karl F. Seidman Consulting Services

Impact on Investor Returns

Table 7-11 and Table 7-12 summarize the potential impact of linkage fee options on the financial returns for equity investors for the lab and office projects scenarios presented above that meet developer return thresholds. This analysis assumes that equity investors finance 35% of total development costs without the linkage fee and then finance 100% of the additional development costs due to the linkage fee increases, and that their required return is 20%. Developers reported a range of required returns for equity investors from 12% at the low end to 20% at the high end. The higher 20% return is used for the analysis since fee increases will have a larger impact for investors with the higher threshold—thus providing the scenario with the greatest impact on investor returns from a given fee increase.

The annual percentage return on equity is reduced due to the added investment capital needed to fund linkage fee costs. At the maximum fee increase of $70.13/SF, investment returns for lab projects decrease from 20% to 18.06% at the higher development cost level ($1400/SF) and to 17.77% for the lower cost scenario (17.77%). For office development at $1000/SF, investor returns drop from 20% to 17.39% with a $70.13 fee increase. These impacts are large enough to deter investment from some equity investors and make it more difficult for developers to raise needed capital to undertake projects. The impact is considerably less with lower fee increases between $5 and $20 options. For lab projects, the reductions in investor returns range from a low of 15 basis points to a high of 69 basis points. For office development, a $5 fee increase is estimated to reduce investor returns by 21 basis points, which grows to an 82 basis point increase with a $20 increase. Whether these impacts are large enough to deter equity investment in Boston projects will depend on how strictly investors stick to their return threshold and the availability of alternative investments that will meet the 20% return requirement. With linkage fee increases up to $20, investors would still be within 70 basis points of their investment target and earning over 19%.

Table 7-11. Estimated Impact of Linkage Fee Increase Options on Equity Investor Returns for Laboratory Projects

Lab Projet at $1400 PSF	No Fee Increase	$5 Fee Increase	$10 Fee Increase	$20 Fee Increase	$70.13 Fee Increase
Total Development Cost	$560,000,000	$561,500,000	$563,000,000	$566,000,000	$581,039,000
Equity Investment	$196,000,000	$197,500,000	$199,000,000	$202,000,000	$217,039,000
Original Equity Return at 20%	$39,200,000	$39,200,000	$39,200,000	$39,200,000	$39,200,000
Adjusted Rate of Return with Fee		19.85%	19.70%	19.41%	18.06%
Differential		**-0.15%**	**-0.30%**	**-0.59%**	**-1.94%**
Lab Project at $1200 PSF					
Total Development Cost	$480,000,000	$481,500,000	$483,000,000	$486,000,000	$501,039,000
Equity Investment	$168,000,000	$169,500,000	$171,000,000	$174,000,000	$189,039,000
Original Equity Return at 20%	$33,600,000	$33,600,000	$33,600,000	$33,600,000	$33,600,000
Adjusted Rate of Return with Fee		19.82%	19.65%	19.31%	17.77%
Differential		**-0.18%**	**-0.35%**	**-0.69%**	**-2.23%**

Source: Karl F. Seidman Consulting Services

Table 7-12. Estimated Impact of Linkage Fee Increase Options on Equity Investor Returns for Office Development

Office Project at $1000 PSF	No Fee Increase	$5 Fee Increase	$10 Fee Increase	$20 Fee Increase	$70.13 Fee Increase
Total Development Cost	$400,000,000	$401,500,000	$403,000,000	$406,000,000	$421,039,000
Equity Investment	$140,000,000	$141,500,000	$143,000,000	$146,000,000	$161,039,000
Original Equity Return at 20%	$16,800,000	$16,800,000	$16,800,000	$16,800,000	$16,800,000
Adjusted Rate of Return with Fee		19.79%	19.58%	19.18%	17.39%
Differential		**-0.21%**	**-0.42%**	**-0.82%**	**-2.61%**

When weighed across all three potential impacts, adopting a combined housing and jobs linkage fee between $10 and $20 is unlikely to make Boston an uncompetitive location either for new laboratory development or for attracting future tenants to new development projects. However, the weaker market conditions for office and hotel projects and the challenges to financial feasibility faced by these projects warrant a more cautious approach to fee increases for these development types.

VIII. Recommended Linkage Fee Policies

The analysis detailed in this report supports an increase in Boston's jobs and housing linkage fee rates. Projected new construction of 14.9 million square feet in Development Impact Projects over the next ten years is expected to generate almost 32,000 jobs. This employment growth will create demand for 4,003 new units of affordable housing and a need for expanded employment education and training services to secure access to these jobs for the city's low-income and moderate-income workers. An estimated financing gap of $895 million will exist to reach the $2.12 billion in total development costs necessary to build an additional 4,033 housing units. For workforce development services, a funding gap of $47.3 million to $60.4 million is needed to ensure resident access to 50% of the entry-level and middle-skill jobs generated by this development. The maximum warranted housing and jobs exactions to fill these financing gaps are $80.20 per square foot and $5.62 per square foot, respectively, under Boston's current linkage polices with a 100,000 square foot exemption. Several long-standing linkage policies and administrative practices also would benefit from updating to better reflect current market conditions and simplify processes.

The following recommendations advance two goals: (1) simplifying linkage fee policies and administration to generate linkage revenue more quickly, and bring Boston's policies more in line with other cities; and (2) addressing the need for increased linkage revenue to mitigate the impacts of future development while ensuring that Boston remains a competitive location for continued investment and economic development.

Administrative and Policy Changes

The following changes are recommended to simplify, update and improve Boston's linkage policies:

- **Change the payment schedule to a single payment at certificate of occupancy**. This will simplify fee collection and administration and will bring Boston's payment schedule in line with Cambridge. In addition to shortening and simplifying fee payment, it shifts the initial payment for all projects to when projects are completed and beginning to generate revenue, reducing their need to secure more costly pre-development financing for linkage fees. The shorter payment period is unlikely to impact project financial feasibility since many projects already reserve or escrow funds for the multi-year linkage payment upfront and the shorter payment period has a very small impact on developer returns, in the range of .7 to 2.5 basis points.
- **Eliminate the different fee payment schedule for projects in the Downtown District.** This change is aligned with the prior policy recommendation and eliminates an outdated distinction between a small Downtown District (that primarily corresponds to the financial district) and other development areas. The existing policy dates to when Boston's financial district was the city's strongest and highest rent office location and thus deemed able to pay linkage fees at a faster schedule. However, Boston now has several active non-residential development districts with rents comparable to the financial district.

- **Eliminate the 100,000 SF exemption**. Removing the exemption serves to better align linkage fee payments with a project's development impact since all of the development space in a project generates the housing and employment impacts that linkage fees are designed to mitigate.

Housing and Job Fee Recommendations

In setting new linkage fees, Boston should differentiate between life science lab development and other projects. Lab projects achieve higher returns and financial returns than other uses and therefore can afford to make a larger contribution to mitigating impacts. Since the recommended fees are well below the maximum warranted fees, the higher proposed fee for lab projects will still meet the legal standard of proportionality, in which fees must be proportional to what is needed to mitigate impacts. The proposed fees are based on doubling the total linkage fee rate for lab projects and a lesser 50% increase for projects with other primary uses, including office, hotel, retail and institutional use. Based on these considerations, the following linkage fee rates are recommended:

- **A new jobs linkage fee of $3.62**, which is an increase of $1.23. This is the fee level necessary to generate the funding at the mid-point of the estimated funding gap to advance 50% resident employment in entry and middle-skill jobs at new development projects, with elimination of the 100,000 SF exemption. If the exemption is not eliminated the comparable jobs fee level is $4.75
- **A new housing linkage fee of $26.78 for development projects with a primary lab use,** an increase of $13.78 which will double the total linkage fee from $15.39 to $30.78 with elimination of the 100,000 SF exemption. If the exemption is not eliminated the comparable housing fee level is $35.66.
- **A new housing linkage fee of $19.09 for development projects with a primary** hotel, office, retail or institutional use, an increase of $6.09, which will increase the total linkage fee to $23.09. If the exemption is not eliminated, the comparable housing fee level is $25.41.

A financial analysis of the impact of the proposed fee increases indicate that they are likely to have a modest impact on developer and equity investor returns:

- For lab development projects, a developer's return on cost would be lowered from 6.39% to 6.32% for a project with development costs of $1,400 PSF and from 7.45% to 7.36% for a building with development costs of $1,200 PSF. Equity investors would see an estimated decrease in their investment return from 20% to 19.39% and to 19.29% % for lab projects with development costs of 1,400 PSF and $1,200 PSF, respectively.
- For office development projects at $1,000 PSF, a developer's return on cost would be lowered from 6.48% to 6.43%. Equity investors would see an estimated decrease in their investment return from 20% to 19.57%.

The above recommendations and analyses were formulated for linkage fees alone. In setting the final fee rates, the City should consider additional fees or exactions that may be implemented and their combined impact on the economics of development and Boston's competitive position.

Boston's Life Science Workforce Development System

The research for this report highlighted that Boston will experience substantial growth in life science industry employment over the next decade but has an underdeveloped system to connect and train Boston workers for these jobs. Boston is working to create a consortium that will bring together employers, education and training providers, and workforce and support organizations to strengthen the training system and improve access to and pathways for jobs in life science and other STEM industries. Establishing this consortium and working with it to expand the capacity of the life science workforce development system to create a pipeline of low- and moderate-income Boston residents to gain jobs within this fast growing industry needs to be a city priority. It is critical to ensure that new funds raised through the jobs linkage fee can be effectively deployed to connect Boston workers to this increasingly important source of employment and income.

Appendix A: Definitions of Uses Included in Development Impact Project Definition[62]

Most recent state legislation (2020) states that "'exaction' uses (include) (1) office; (2) retail business or service; (3) institutional or educational; (4) hotel or motel, but not including an apartment hotel or lodging house; or (5) other uses as determined by the zoning commission.

Following are exaction uses per the Article 80 ordinance.

	Uses	Use Item Numbers
(a)	Office	39, 39A, 40, 41, 42
(b)	Retail Business;	30, 31, 32, 34, 34A, 35, 36,
	Service; Public	36A, 37, 37A, 38, 38A, 43, 44,
	Service Uses	45, 46, 47, 48, 49, 60, 60A, 61
(c)	Institutional;	16, 16A, 18, 19, 20, 20A, 21,
	Educational	22, 22A, 23, 24, 29
(d)	Hotel; Motel	15 (excluding apartment hotel)

Office

39- Office of accountant, architect, attorney, dentist, physician, or other professional person, not accessory to a main use
39A- Clinic not accessory to a main use
40- Real estate, insurance or other agency office
41- Office building, post office, bank (other than drive-in bank) or similar establishment
42- Office or display or sales space of a wholesale, jobbing or distributing house

Retail

30- Private club (including quarters of fraternal organizations) operated for members only
31- Public service pumping station; public service sub-station, automatic telephone exchange; telecommunications data distribution center; outdoor payphone
32- Telephone exchange (other than automatic)
34- Store primarily serving the local retail business needs of the residents of the neighborhood, but not constituting a business as described in Use Item No. 34A, including, but not limited to, store retailing one or more of the following: food, baked goods, groceries, packaged alcoholic beverages, drugs, tobacco products, clothing, dry goods, books, flowers, paint, hardware and minor household appliances

[62] Numbers refer to use items in Article 8 of Boston's Zoning Code

34A- A shop for the barter, rental or sale of printed matter, pictures or motion picture film, if such shop is not open to the public generally but only to one or more classes of the public excluding any minor by reason of age; or if such shop keeps a part of such stock segregated as available to only one or more classes of the public excluding any minor by reason of age; or shop for the barter, rental or sale of printed matter, pictures or motion picture film bearing a legend restricting it to adults only or to one or more classes of the public excluding any minor by reason of age
35- Department store, furniture store, general merchandise mart, or other store serving the general retail business needs of a major part of the city, including accessory storage
36- Indoor sale of motor vehicles

Service; Public

36A- Sale over the counter, not wholly incidental to a use listed under Use Item No. 34 or Use Item No. 37 or Use Item No. 50, of on-premises prepared food or drink for off-premises consumption or for on-premises consumption if, as so sold, such food or drink is ready for take-out

Eating Places and Entertainment

37- Lunch room, restaurant, cafeteria or other place for the service or sale of food or drink for on-premises consumption, provided that there is no dancing nor entertainment other than phonograph, radio and television, and that neither food nor drink is served to, or consumed by, persons while seated in motor vehicles
37A- The maintenance and operation of any amusement game machine in a private club, dormitory, fraternity or sorority house, or similar noncommercial establishment (other than as an accessory use described in Use Item No. 86a)
38- Place for sale and consumption of food and beverages (other than drive-in restaurant) providing dancing or entertainment or both; theater (including motion picture theater but not drive-in theater); concert hall; dance hall; skating rink; bowling alley; pool room; billiard parlor; other social, recreational or sports center conducted for profit; or any commercial establishment maintaining and operating any amusement game machine (other than as an accessory use described in Use Item No. 86b or 86c); provided that such establishment is customarily open to the public at large and does not exclude any minor by reason of age as a prevailing practice
38A- Any of the uses enumerated in Use Items 38 and 52 if such establishment is customarily not open to the public generally but only to one or more classes of the public excluding any minor by reason of age
43- Barber shop; beauty shop; shoe repair shop; self-service laundry; pick-up and delivery station of laundry or dry-cleaner; or similar use
44-Tailor shop; hand laundry; dry- cleaning shop

Service Uses

45- Laundry plant; dry-cleaning plant; rug cleaning plant
46-Caterer's establishment; photographer's studio; printing plant; taxidermist's shop; upholsterer's shop; carpenter's shop; electrician's shop; plumber's shop; radio and television repair shop

47- Funeral home; undertaker's establishment; mortuary
48- Research laboratory; radio or television studio
49- Animal hospital or clinic; kennel; pound
60- Repair garage; gasoline service station; car wash
60A, Sale and installation within a building of batteries, seat covers, tires and similar automotive parts and accessories
61-Rental agency, storing, servicing, and/or washing rental motor vehicles and trailers

Institutional

16- Elementary or secondary school attendance at which satisfies the requirements of the compulsory education laws of the Commonwealth of Massachusetts
16A-College or university granting degrees by authority of the Commonwealth of Massachusetts
18- Trade, professional or other school
19- Machine shop or other noisy activity accessory to a school, college or university
20- Library or museum, not conducted for profit and **not accessory** to a use listed under Use Item No. 16A, 18, 22, 23, or 24
20A-Library or museum not conducted for profit, and **accessory to** a use listed under Use Item No. 16A, 18, 22, 23, or 24, whether or not in the same lot
21-Place of worship; monastery; convent; parish house

Educational

22-Hospital or sanatorium not providing custodial care for drug addicts, alcoholics or mentally ill or mentally deficient persons; clinic or professional offices accessory to a hospital or sanatorium whether or not on the same lot
22A- Convalescent, nursing or rest home; home for the aged; orphanage; or similar institution not for correctional purposes
23-Any use listed under Use Item No. 22 or 22A providing custodial care for drug addicts, alcoholics or mentally ill or mentally deficient persons
24-Scientific research and teaching laboratories not conducted for profit and accessory to a use listed under Use Item No. 16, 16A, 18, 22, or 23, whether or not on the same lot, provided that all resulting cinders, dust, flashing, fumes, gases, odors, refuse matter, smoke and vapor are effectively confined to the lot or so disposed of as not to be a nuisance or hazard to health or safety; and provided also that no noise or vibration is perceptible without instruments more than fifty feet from the lot or any part of the lot
29-Adult education center building; community center building; settlement house

Hotel; Motel

15-Hotel; motel; apartment hotel

Appendix B: Tables Detailing Housing Subsidy Analysis

Table B-1. Illustrative Distribution of Affordable Rental Housing Units by Number of Bedrooms and Building Area

	Number of Units	Average Net Square Feet (SF) per Unit [1/]	Total Living Area
Studio	469	600	281,400
One Bedroom	222	800	177,600
Two Bedrooms	386	1,000	386,000
Three Bedrooms	333	1,200	399,600
Total Units	**1,410**	**883**	**1,244,600**
Net Square Feet as a Percent of Gross Square Feet [1/]			85.0%
Total Gross Square Feet (GSF) (Rounded)			**1,464,000**
Average Gross Square Feet Per Unit [1/]			***1,038***

1/ Based on affordable housing development projects which average 1,100 gross square feet per unit.

Source: City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.

Table B-2. Affordable Ownership Housing Units by Number of Bedrooms and Building Area

	Number of Units	Average Net Square Feet (SF) per Unit [1/]	Total Living Area
Studio	721	600	432,600
One Bedroom	418	800	334,400
Two Bedrooms	962	1,000	962,000
Three Bedrooms	492	1,200	590,400
Total Units	**2,593**	**894**	**2,319,400**
Net Square Feet as a Percent of Gross Square Feet [1/]			85.0%
Total Gross Square Feet (GSF) (Rounded)			**2,729,000**
Average Gross Square Feet Per Unit [1/]			***1,052***

1/ Based on affordable housing development projects which average 1,100 gross square feet per unit.

Source: City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.

Table B-3. Conversion of Ownership Unit Household Income by Persons to Household Income by Bedrooms

Household Size	Annual Income [1/]	Number of Households [2/]	Aggregate Income
Calculation of Aggregate Income			
Moderate Income Households			
1 Person	$65,747	3	$197,241
2 Persons	$83,373	8	666,984
3 Persons	$93,697	14	1,311,758
4 Persons	$105,084	59	6,199,982
Total	**$99,714**	**84**	**$8,375,965**
Middle Income Households			
1 Person	$105,015	959	$100,709,362
2 Persons	$112,230	875	98,201,141
3 Persons	$115,136	306	35,231,638
4 Persons	$123,624	369	45,617,164
Total	**$111,502**	**2,509**	**$279,759,305**

	Units by Number of Bedrooms				
	Studio	**One bedroom**	**Two bedroom**	**Three bedroom**	**All Units**
Distribution of Units by Number of Bedrooms					
1 Person	75%	25%	0%	0%	100%
2 Persons	0%	20%	80%	0%	100%
3 Persons	0%	0%	80%	20%	100%
4 Persons	0%	0%	0%	100%	100%
Moderate Income Households					
Distribution of Low-Income Aggregate Income by Unit Size					
1 Person	$147,931	$49,310	$0	$0	$197,241
2 Persons	0	133,397	533,587	0	666,984
3 Persons	0	0	1,049,406	262,352	1,311,758
4 Persons	0	0	0	6,199,982	6,199,982
Total	**$147,931**	**$182,707**	**$1,582,994**	**$6,462,334**	**$8,375,965**
Total Units by Size [2/]	**2**	**3**	**17**	**62**	**84**
Avg. Income per Unit by Size	***$73,965***	***$60,902***	***$93,117***	***$104,231***	***$99,714***
Middle Income Households					
Distribution of Moderate-Income Aggregate Income by Number of Bedrooms					
1 Person	$75,532,022	$25,177,341	$0	$0	$100,709,362
2 Persons	0	19,640,228	78,560,913	0	98,201,141
3 Persons	0	0	28,185,310	7,046,328	35,231,638
4 Persons	0	0	0	45,617,164	45,617,164
Total	**$75,532,022**	**$44,817,569**	**$106,746,223**	**$52,663,491**	**$279,759,305**
Total Units by Size [2/]	**719**	**415**	**945**	**430**	**2,509**
Avg. Income per Unit by Size	***$105,051***	***$107,994***	***$112,959***	***$122,473***	***$111,502***

1/ Source: Karl F. Seidman Consulting Services. Weighted average annual household income based on anticipated mix of occupations and average occupational wages for based on projected commercial development in Boston.

2/ See Table 5-3.

Source: City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.

Table B-4. Sales Price Analysis by Unit Size / Number of Bedrooms based on Estimated Monthly Housing Costs Set at 30% of Household Income

Assumptions	Low-Income	Moderate-Income	
Mortgage	4%	7%	Assumed Down payment
	96%	93%	Percent of Price covered by Mortgage
	5.64%	5.64%	Mortgage interest rate [1/]
	NA	0.72%	Private Mortgage Insurance [2/]
Real Estate Taxes	$10.88	per 1,000 of assessed values [3/]	
Residential Exemption	$3,305	reduction in annual taxes [3/]	
Condo Fees	$300.00	monthly per BPDA	

	Unit Size / Number of Bedrooms			
	Studio	One Bedroom	Two Bedroom	Three Bedroom
Extremely and Very Low-Income Households	Not applicable because Extremely and Very Low-Income housing units are assumed to be all rental units.			
Moderate Income Households				
Sales Price	$279,835	$220,942	$357,561	$400,715
Down payment	$11,193	$8,838	$14,302	$16,029
Monthly Payment Calculation				
Mortgage Payment	$1,549	$1,223	$1,979	$2,218
Real Estate Taxes	$0	$0	$49	$88
Condo Fees	$300	$300	$300	$300
Total Monthly Payment [4/]	**$1,849**	**$1,523**	**$2,328**	**$2,606**
Monthly Payment Target	$1,849	$1,523	$2,328	$2,606
Middle Income Household				
Sales Price	$396,012	$426,766	$446,546	$484,510
Down payment	$27,721	$29,874	$31,258	$33,916
Monthly Payment Calculation				
Mortgage Payment	$2,124	$2,288	$2,395	$2,598
PMI [5/]	$119	$0	$0	$0
Real Estate Taxes	$84	$112	$129	$164
Condo Fees	$300	$300	$300	$300
Total Monthly Payment [4/]	**$2,626**	**$2,700**	**$2,824**	**$3,062**
Monthly Payment Target	$2,626	$2,700	$2,824	$3,062

1/ Average 30 year fixed rate mortgage in Massachusetts on July 21, 2022. Source: Bankrate.com.
2/ Low and 62% of moderate income households (all the 2+ person households) qualify for the One Mortgage Program (http://www.mhp.net/homeownership/homebuyer/one_mortgage.php) that waives Private Mortgage Insurance (PMI) for first time homeowners through participating lenders. PMI costs "between $40 and $80 per
3/ Source: City of Boston.
4/ Assumes 30% of income.
5/ Half of moderate income households are assumed to pay PMI and the other half are assumed to have PMI waved under the One Mortgage Program.

Source: Massachusetts Housing Partnership; City of Boston; Karl F. Seidman Consulting Services; and ConsultEcon, Inc.