

Boston's Economy 2019



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Summary of Recent Trends in Boston's Economy

Boston's Economy 2019 report details Boston's recent economic growth. It covers trends in employment, wages, housing prices, and real estate. This report introduces the BPDA's employment forecast, which explores how the rate of housing production and the area's skilled workforce may impact the pace of local job growth. The Spotlight Section delves into Boston's higher education industry examining enrollment, graduation, and tuition trends. Finally, the Forecast Section describes the outlook for Boston's economic future, hinting at continued growth.

Economic Growth

Boston's economy grew by 2.9 percent from 2016 to 2017 as measured by Gross City Product (GCP), continuing an upward trajectory in GCP since 2013. Per capita income for Boston residents grew by 5.0 percent to \$42,000.

Unemployment

The annual unemployment rate in 2018 was 3.4 percent, the same as in 2017. The unemployment rate in Boston remains below the state and national levels.

Job Growth

From 2016 to 2017, Boston's total payroll and non-payroll jobs increased 2.2 percent to 812,153.¹ The BPDA projects job growth to continue throughout the decade, with the city adding between 107,000 and 150,000 jobs by 2026.

Wages

From 2016 to 2017 average weekly payroll compen-

sation in Boston rose 2.5 percent in real terms to \$1,878.

Real Estate

In 2018, the Boston Planning and Development Agency (BPDA) Board approved 11.9 million square feet of development including 4.5 million square feet of new residential development, for a total of 4,219 potential new housing units across the city.²

Office inventory, vacancies and rents all increased slightly from 2017 to 2018. In 2018, Boston added 1.2 million square feet of office space, and according to CoStar the city is estimated to have 113 million square feet of total office space. The office vacancy rate for 2018 was 6.8 percent, which is significantly lower than the national rate of 16.7 percent.³

There were 3,733 new housing units built in 2018.⁴ The weighted average advertised rent for an apartment in Boston was \$2,446 in 2018, up 3.3 percent from the year before. From 2017 to 2018, there was 6.3 percent real growth in single-family sales prices and 7.9 percent real growth in condominium sales prices.⁵

National and Local Economy Forecast

Economic growth at the global and national level is forecasted to slow from 2019 on to 2020. In Massachusetts, and particularly in Boston, growth may continue to be strong, due to low unemployment and job growth.

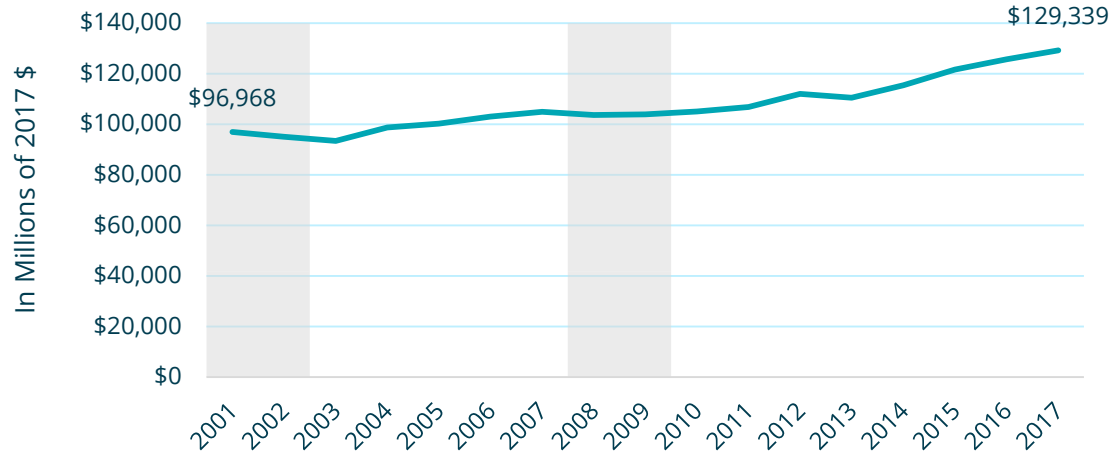
Economic Growth

Boston Economic Growth

Building on strong growth from the prior year, Boston's economy grew by 2.9 percent from 2016 to 2017 as measured by GCP.⁶⁷ Boston's real GCP has grown steadily over the past sixteen years.

For 2017, Boston's GCP represents an estimated \$129.3 billion of economic activity generated in the city. Figure 1 depicts the growth of Boston's GCP from 2001 to 2017, in fixed 2017 dollars.

FIGURE 1 Boston Real GCP, 2001 to 2017
In Millions of Fixed 2017 Dollars



Source: U.S. Bureau of Economic Analysis (BEA), and Massachusetts Executive Office of Labor and Workforce Development, (EOLWD), BPDA Research Division Analysis.

City, State and National Economic Growth

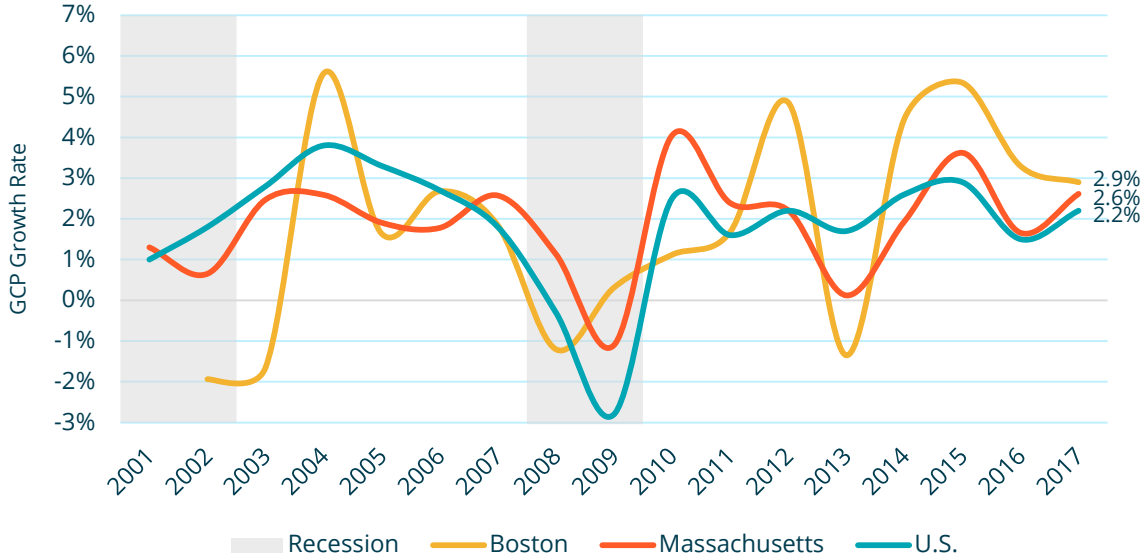
Since 2010, Boston's share of statewide economic activity has been slowly increasing from 21.7 percent to 23.8 percent in 2017. From 2016 to 2017, Boston's share of statewide economic activity increased slightly by 0.2 percentage points. After briefly dipping below the national and state growth rates in 2013, Boston's economic growth in each of the past four years surpassed that of the U.S. and Massachusetts, which grew by 2.2 percent and 2.6 percent respectively from 2016 to 2017. Figure 2 shows the economic growth rates for Boston, Massachusetts, and the U.S. From 2010 to 2017, Bos-

ton had compound annual growth of 5.7 percent, compared to 4.4 and 3.8 percent growth respectively at the state and national levels.

Annual data for 2018 are not yet available for Massachusetts or Boston. At the national level, annual real GDP growth picked up in 2018, rising to 3.1 percent after fluctuating in the previous years. The Congressional Budget Office (CBO) projects deceleration in economic growth in the coming year, with growth of 2.4 percent in 2019 and 1.6 percent in 2020. Additional discussion of local and national forecasts will follow in the Forecast Section.

FIGURE 2

Real GCP growth rate for Boston, Massachusetts, and the U.S., 2001 to 2017



Source: U.S. BEA, Massachusetts EOLWD, BPDA Research Division Analysis.



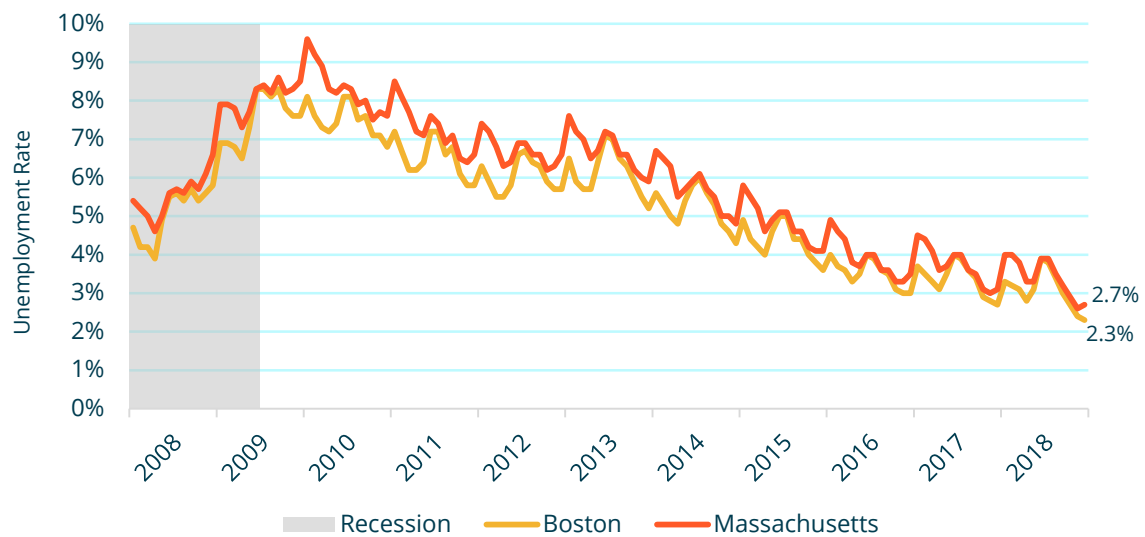
Source: South Boston Waterfront, BPDA Research Division, 2018.

Employment and Wages

Boston's resident labor force grew by more than 14,860 people from 2017 to 2018.⁸ City residents continue to enjoy historically low levels of unemployment. In 2018, Boston had an average unemployment rate of 3.4 percent. Monthly unemployment rates for Boston have remained under five percent since August of 2015, and below four percent since July 2017. Since 2008, Boston's unemployment rate has generally been lower than Massachusetts, though the state and city rates were the same for parts of the summer in 2009,

2016, and 2017. Unemployment tends to be lowest in December and highest during the summer months. The unemployment rate for 2018 fluctuated between a low of 2.3 percent in December and a high of 3.9 percent in June. While seasonally adjusted unemployment rates are available for the national and state level, only unadjusted rates are available for the city. As of April 2019, the unemployment rate was 2.2 percent for Boston, 2.6 percent for Massachusetts, and 3.6 percent for the United States as a whole.

FIGURE 3 Monthly Unemployment Rates in Boston and Massachusetts, January 2008 to December 2018



Source: U.S. BEA, Massachusetts EOWLD, BPDA Research Division Analysis.

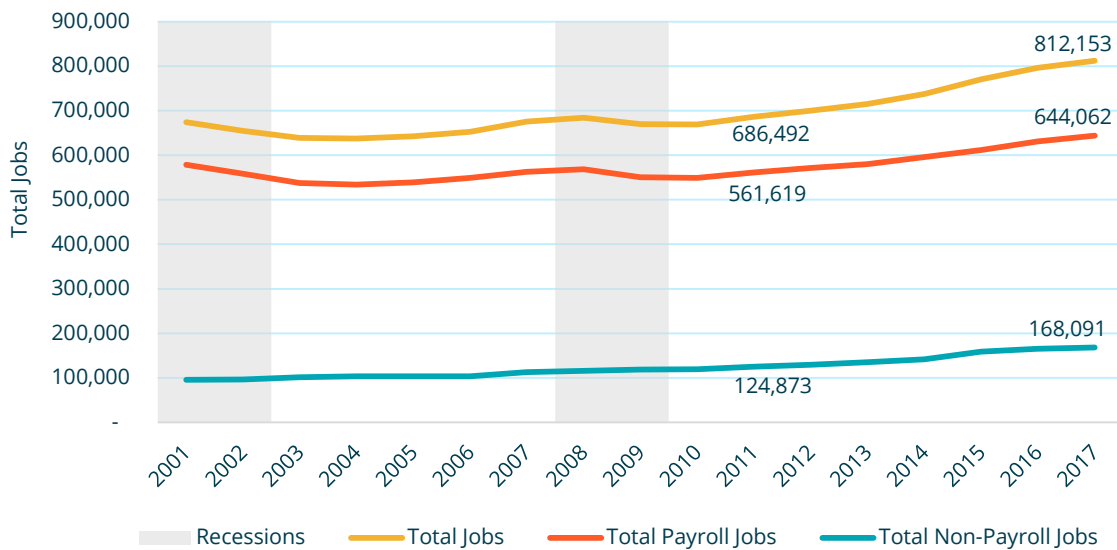
Jobs Located in Boston

Boston is a regional employment center that offers job opportunities for city residents and workers throughout the region. Job growth in Boston has contributed to low unemployment in the greater metropolitan area. The total number of payroll and non-payroll jobs in Boston rose to 812,153 in

2017, the highest level since detailed employment data became available in 1969.

From 2016 to 2017, Boston added 15,942 jobs, an increase of 2.2 percent that outpaced both Massachusetts and the nation. .⁹

FIGURE 4 Boston's Payroll and Non-Payroll Jobs, 2001 to 2017



Source: U.S. BEA, Massachusetts EOWLD, and BPDA Research Division Analysis.

Jobs by Industry

The largest industry in Boston is health care and social assistance with over 148,000 jobs, 18.3 percent of total employment, as shown in Table 1. Four of the ten largest employers in Boston are hospitals: Massachusetts General Hospital, Brigham and Women's Hospital, Boston Children's Hospital, and Beth Israel Deaconess Medical Center. Professional, scientific, and technical services, which covers a variety of in-

dustries including computer systems design, scientific research and development, management consulting, architecture, and law comprises the second largest share of Boston's employment. Finance and insurance firms such as State Street Bank, Fidelity Investments, Liberty Mutual, and John Hancock also employ large numbers of people in Boston.

TABLE 1 Boston's Total Payroll and Non-Payroll Jobs by Industry, 2017

Industry	2017	Percent of Total
Health Care and Social Assistance	148,328	18.3%
Professional, Scientific, and Technical Services	101,413	12.5%
Finance and Insurance	94,329	11.6%
Government	75,807	9.3%
Accommodation and Food Services	64,897	8.0%
Educational Services	57,845	7.1%
Administrative and Waste Services	40,272	5.0%
Real Estate and Rental and Leasing	36,927	4.5%
Retail Trade	35,744	4.4%
Transportation and Warehousing	34,273	4.2%
Other Services	33,414	4.1%
Construction	20,817	2.6%
Information	19,439	2.4%
Arts, Entertainment, and Recreation	18,245	2.2%
Wholesale Trade	9,821	1.2%
Management of Companies and Enterprises	9,687	1.2%
Manufacturing	8,289	1.0%
Utilities	2,249	0.3%
Natural Resources and Mining	349	0.04%
Total	812,153	100%

Note: Columns may not add due to rounding.

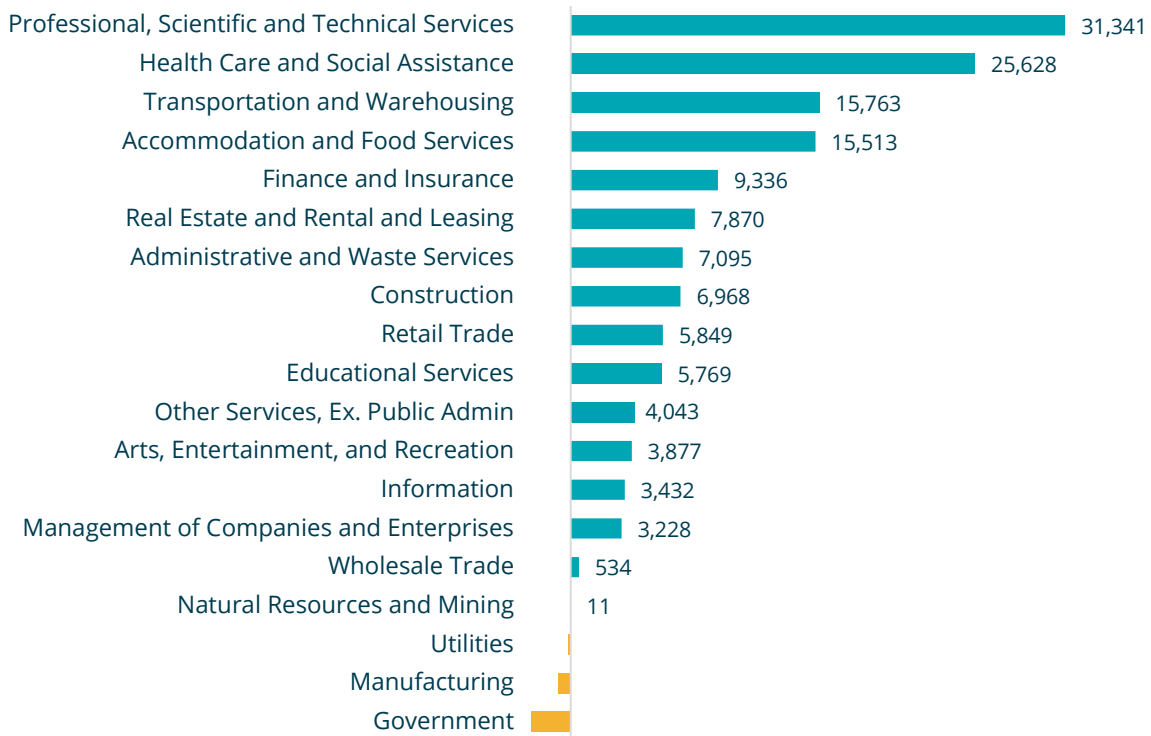
Source: U.S. BEA, Massachusetts EOWLD, BPDA Research Division Analysis.

From 2016 to 2017, Boston's job growth was positive across all industries except educational services and government. Growth was concentrated in professional, scientific and technical services (3,339 new jobs) and health care and social assistance (3,785 new jobs).

Professional, scientific, and technical services, healthcare and social assistance, and transportation and warehousing added the most jobs from 2010 to 2017, as shown in Figure 5.

Government, manufacturing, and utilities saw a decline in jobs from 2010 to 2017. High tech industries, here classified as a subset of professional, scientific, and technical services, information, and manufacturing with a high percentage of their workforce in science, technology, engineering and math (STEM) occupations, averaged 3.1 percent job growth each year between 2010 and 2017.¹⁰

FIGURE 5 Boston's Total Job Growth, 2010 to 2017



Source: U.S. BEA, Massachusetts EOWLD, BPDA Research Division Analysis.

Wages by Industry

From 2016 to 2017, average weekly payroll compensation in Boston rose 2.5 percent in real terms to \$1,878 according to data compiled by Massachusetts Executive Office of Labor and Workforce Development (EOWLD) based on employer filings. This measure of compensation includes bonuses, stock options, severance pay, travel reimbursement, tips and other gratuities, and employer contributions to certain deferred compensation plans, such as 401(k) plans. Because these employer filings represent the most comprehensive source of employment data at the local level, they are the best source for tracking year-to-year changes in local wages, particularly when disaggregating to the industry level.

Annualizing this weekly wage over 52 weeks yields an estimate of \$97,656. This likely overstates the annual pay of the typical worker for a number of reasons. First, the mean average, unlike the median, is inflated by the high pay of top earners. Second, some non-salaried workers are not typically employed for the full 52 weeks, even in an economy with low unemployment. About 85 percent of workers in Suffolk County were employed 50 weeks or more in 2017, according to the American Community Survey (ACS), while nine percent were employed for 40 weeks or fewer.¹¹ Accommodation and food services, arts, recreation and entertainment, retail, education, and construction all have below average rates of full-year employment.

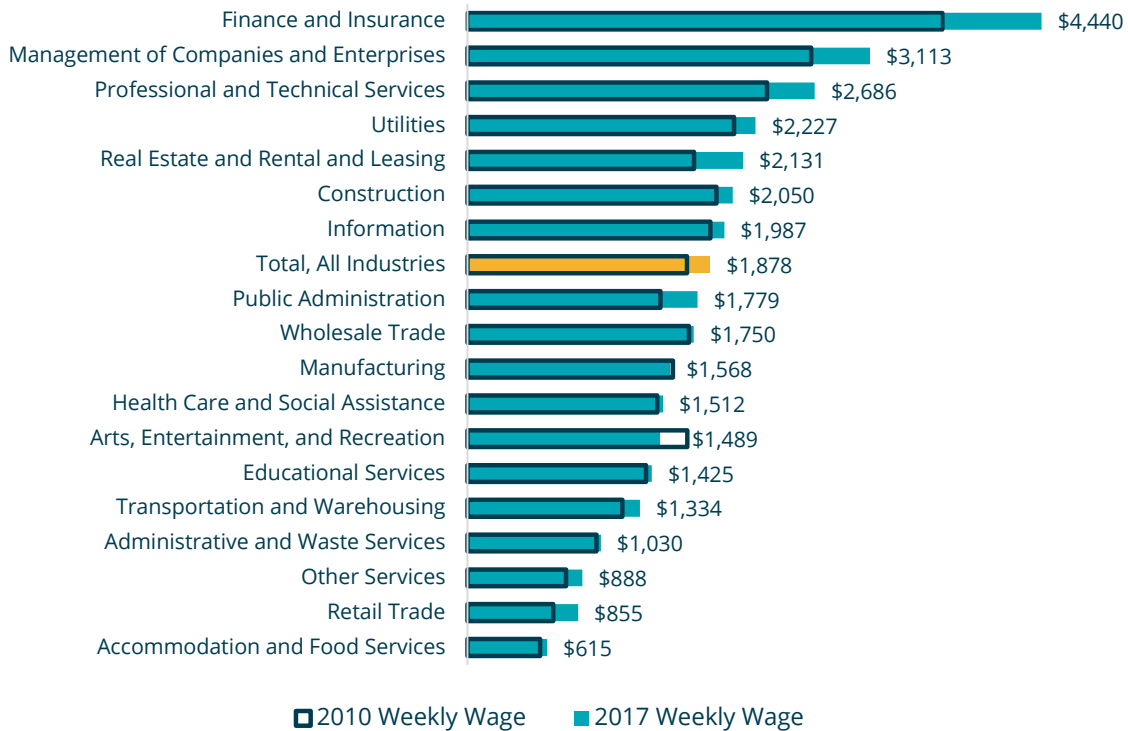
Across all industries, the ACS reports that the mean wage earnings for full-time, full-year workers in Suffolk County was \$93,764 in 2017, while the median was \$68,000.

Shown in Figure 6, the highest wages were in finance and insurance (\$4,440/week), management (\$3,113/week), and professional, scientific, and technical services (\$2,686/week). The lowest wages were in retail (\$855/week) and accommodation and food services (\$615/week). While the accommodation and food service industry provides a large number of jobs, low wages are a concern, as the industry average wage barely clears the living wage as defined by Boston's Living Wage Ordinance.¹²

The average weekly payroll wage for jobs in Boston rose an average of 1.5 percent a year, in real terms, from 2010 to 2017. The most highly paid industries saw the greatest absolute gains in real wages from 2010 to 2017. Finance and insurance gained an extra \$1,101/week, management of companies and enterprises gained \$699/week, and professional, scientific, and technical services gained \$581/week. The lowest paid industries had modest gains in wage growth—accommodation and food services gained \$105/week, other services gained \$197/week, and accommodation and food services gained \$252/week from 2010 to 2017. Of all industries, retail trade had the highest wage growth rate of all industries at six percent from 2010 to 2017. It is possible that increases to the Massachusetts minimum wage contributed to the wage gains for low-wage workers.¹³ Arts, entertainment, and recreation, and durable goods manufacturing had small declines in wages during the same time period.

FIGURE 6

Average Weekly Wages by Industry for 2010 and 2017 In Fixed 2017 Dollars



Source: Massachusetts EOWLD, BPDA Research Division Analysis.

Despite this growth, wage increases have not kept pace with increases in housing costs. Wages have only grown 1.5 percent per year from 2010 to 2017. In comparison, median gross rents have grown by 3.2 percent per year, in real terms, from 2010 to 2017.¹⁴ In real terms, the price of a single-family home grew by 4.9 percent per year from 2010 to 2017, while condo prices have increased by 4.4 percent per year in the same time frame.¹⁵

From 2016 to 2017, wages grew by 2.5 percent—faster than the seven year average. In compari-

son, median gross rents increased by 3.4 percent from 2016 to 2017.¹⁶ Single family house prices increased by 9.5 percent and condo prices remained fairly stable from 2016 to 2017.¹⁷

The most recent data show that housing prices grew by 6.3 percent (single-family) and 7.9 percent (condos) from 2017 to 2018. If housing prices continue to grow at a faster rate than wages, housing affordability in Boston will likely worsen.

Boston Employment Projections

Boston has seen employment grow rapidly over the last decade, adding 143,328 jobs between 2010 and 2017. Will this rapid pace of growth continue over the next decade? To answer this question, the BPDA Research Division developed a model to forecast local employment, incorporating national job projections by industry, recent historic data on employment growth across U.S. metropolitan areas, and local data on the city's employment share within Greater Boston. We present results at both the metro area and city level for three job growth scenarios: the *constant share* model, the *housing growth* model, and the *educated city* model. The results suggest that Boston's advantage in generating new jobs lies in its highly educated workforce. However, in order to reach its full job growth potential, Boston must continue to create enough housing to sustain labor force growth.

Forecasts for Greater Boston Area

All three models utilize the Bureau of Labor Statistics (BLS) 2016-2026 10-year forecast of national private payroll employment by industry. The BLS bases its employment projections on forecasts of the size of the overall labor force and of economic growth and demand for goods and services by industry. Our model investigates how the BLS estimated industry totals for national private payroll employment will be distributed across metropolitan areas.

Constant Share Model

The constant share model starts with the assumption that employment in each industry will grow at its projected national industry growth rate in each metro area. The growth rate of total employment at the metro area level varies only to the extent that overall employment in some areas is concen-

trated in higher growth industries than others.

Using this methodology, private payroll employment in the Greater Boston region is projected to grow at 0.9 percent a year, slightly faster than the BLS projection for the entire country, 0.8 percent. Greater Boston has above average employment in health care and social assistance, education, and professional and technical services - some of the industries projected to grow most quickly nationally - and a lower concentration in manufacturing - projected by BLS to continue to shrink at the national level.

Housing Growth Model

While the constant share model can serve as a conservative baseline for projecting regional growth, region-specific factors outside of industry structure are likely to impact local growth rates. To explore how regional differences have shaped job growth in the recent past and may continue to do so in the future, we calculate industry employment for each U.S. metro area each year between 2000 and 2016 using County Business Patterns data. We then use regression modelling to understand how a large set of variables such as area education level, income, density, weather, public transit usage, and housing permitting impacted growth over this entire time period. More information on the specific methods used will be available in a forthcoming technical paper.

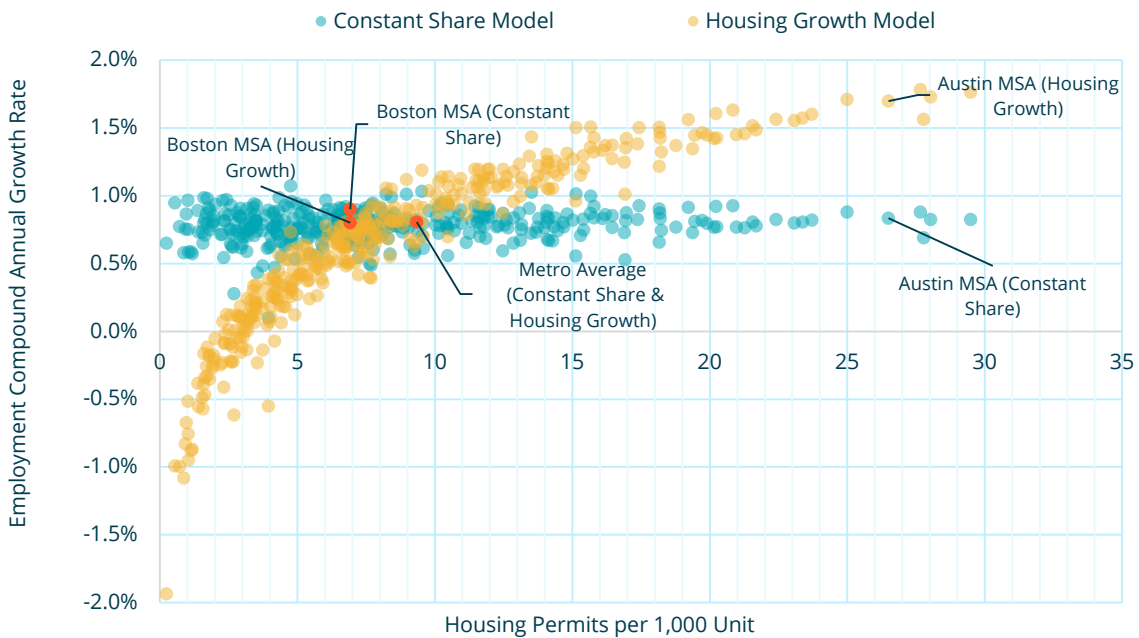
Across all specifications we ran, the most robust predictor of future job growth was the amount of housing permitted (between 1998 and 2000) as a share of the existing stock in 2000. On average, an area permitting an additional one percent of their existing housing stock saw annual employment growth 0.6 percentage points faster than average.

That areas permitting higher shares of new housing would see more rapid employment growth is unsurprising, though the strength of the relationship even over an extended time horizon is striking. Though a metro area could add employment without adding housing if a higher share of the population entered employment or if household size expanded, in most places rapid job growth can be sustained only by increasing housing supply. This is particularly true for areas like Boston which are reaching full employment.

The quantity of housing permitted relative to the current stock can be expected to strongly predict job growth for the following reasons. First, private actors such as developers tend to propose new residential construction in areas where they ex-

pect future job growth to be strong and to create demand for more housing. Second, permitting activity and housing supply are a product of land use regulations, with areas in the South and Southwest regions of the U.S., generally having more permissive land use regulations compared to areas in the Northeast and in California.¹⁸ In the recent past, permissive areas with strong economies have seen very rapid growth in population and employment, whereas economic success in more restrictive areas is often reflected in high incomes and housing prices.¹⁹ Finally, higher permitting activity implies direct job creation in industries related to residential construction, which in turn has a multiplier effect on job creation in other parts of the economy.

FIGURE 7 Constant Share and Housing Growth Models



Note: Growth rates in the Constant Share model show relatively little dispersion across places. The Housing Growth model introduces substantial heterogeneity in predicted growth. Boston, with housing permitting just below the national average, falls modestly, while areas with high levels of housing permitting, like Austin, increase dramatically.

Source: BPDA Research Division Analysis.

For all of these reasons, we expect the robust correlation between permitting and job growth to continue over our projection period. What does this mean for Greater Boston? The *housing growth model* augments the constant share model by incorporating Census permitting data from 2014-2016 and the coefficients from our permitting regression to the constant share model. When taking into account the impact of recent housing permitting, Greater Boston's rate of growth decreases slightly from the constant share model, aligning with the 0.8 percent annual growth predicted for the country as a whole.

idence that the rate of permitting activity in the region has converged towards the average metro area over the past couple of decades. While Greater Boston permitted new housing as a share of its current stock at about half the rate of the average metro area from 1998 to 2000, the region's rate of permitting from 2014 to 2016 rose modestly as the national rate substantially declined²⁰. Within the region, this resurgent building activity was focused within the city of Boston. Permitting in Suffolk County has risen to four times its level from two decades prior, while permitting has fallen in five of the six other counties included in the Boston metro area.

That Greater Boston's employment growth remains strong in the housing growth model is ev-

TABLE 2 Boston MSA Average Yearly Housing Permits by County

	Average Yearly Permits 1998-2000	Average Yearly Permits 2014-2016	Permits per 1,000 Existing Units, 1998-2000	Permits per 1,000 Existing Units, 2014-2016
Boston-Cambridge-Newton, MA-NH	11,908	13,436	6.8	6.9
Suffolk County, MA	895	4,025	3.1	12.1
Rockingham County, NH	1,769	1,007	15.6	7.7
Strafford County, NH	521	357	11.4	6.7
Middlesex County, MA	3,377	4,074	5.8	6.5
Plymouth County, MA	1,764	1,207	9.7	5.9
Norfolk County, MA	1,722	1,593	6.7	5.7
Essex County, MA	1,859	1,174	6.5	3.8

Source: U.S. Census Bureau, Building Permits Survey, Population Estimates Program (PEP), BPDA Research Division Analysis.

The *housing growth model* offers a cautionary note that even as the city has seen record levels of residential approvals and construction, the regional housing market is barely keeping pace with the level of employment growth that would be anticipated even under the relatively conservative

assumption of the *constant share model*. Sluggish housing growth at the regional level continues to threaten the economy, pushing up housing prices and potentially causing prospective employers to consider locating in regions that can offer employees a lower cost of living.

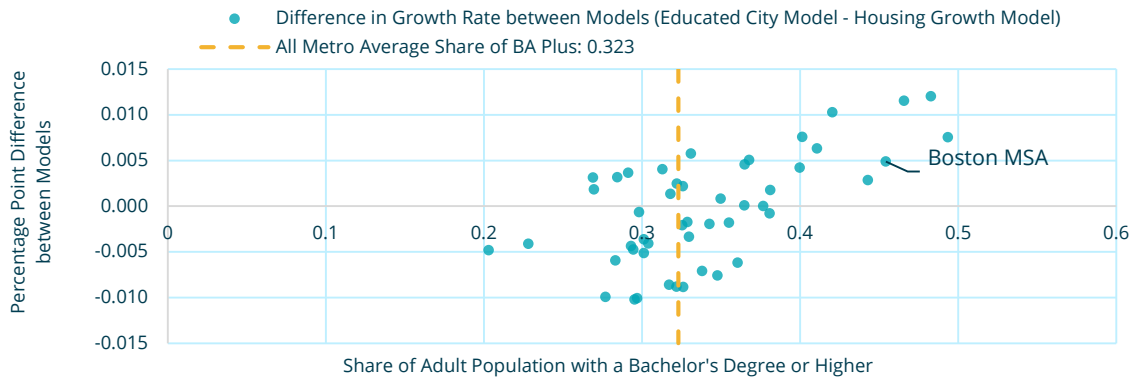
Educated City Model

The third model considers which economic forces might increase Boston's job growth relative to the constant share model. Among the strongest positive correlates of job growth in our regression was the share of residents with a college degree. Metro regions with a ten percent higher share of adults with bachelor's degrees in 2000 saw an average annual rate of job growth that was 0.3 percentage points higher from 2000 to 2016.

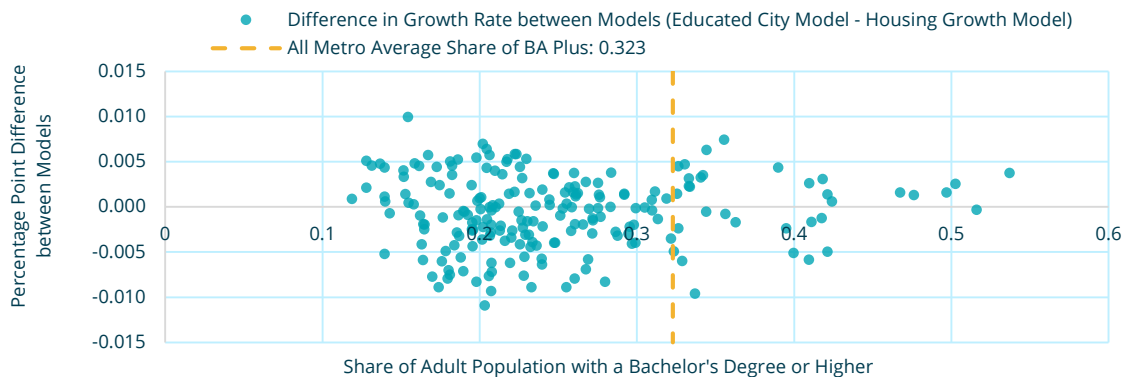
As some authors have pointed out, the impact of education on local productivity seems particularly strong in dense urban areas.²¹ Whereas at one time increased urban density was associated with higher wages and labor productivity across all metro areas, in more recent decades, only areas that combine this density with an educated workforce have seen elevated levels of productivity. This complementarity between urban density and education should attract job growth to places that possess both.

FIGURE 8 Difference between Housing Growth and Educated City Models among Largest Metro Areas and Smallest Metro Areas

Largest Metro Areas



Smallest Metro Areas



Note: The graphs depict the difference between the annual growth rate estimates from the Educated City model and the Housing Growth model. Our model predicts that large metro areas with high levels of education, such as Boston, will see the most rapid growth conditional on other factors such as housing permitting. The upward sloping relationship between education and growth is not present among smaller metros areas.

Source: U.S. Census Bureau, 2000 Decennial Census, 2012-2016 ACS 5-year estimates, Building Permits Survey, Population Estimates Program (PEP), BPDA Research Division Analysis.

A regression of job growth from 2000 to 2016 on the initial share of the adult population with a college degree, local employment density, and the interaction between the two variables confirms that job growth has been particularly strong in dense, educated cities and their surrounding regions. Greater Boston, the tenth largest metro area in the country with the fourth highest share of population holding a BA among the 50 largest metro areas, is among the areas best positioned to take advantage of this trend.

The *educated city model* explores what would happen if this trend continued by adding to the housing growth model the impact of 2016 levels of education, employment density and their interaction multiplied by the coefficients in the regression model from growth over the 2000 to 2016 period. This specification allocates national employment growth towards large cities with high levels of education, with cities like Austin that have high levels of education and housing permitting seeing the most growth.

Greater Boston's growth is also considerably accelerated in this model, with private payroll employment anticipated to grow at an annual rate of 1.3 percent. This model may better capture the appeal of the Boston area to employers looking for skilled workers. Whether labor demand can be converted into rapid job growth depends again on whether housing supply sufficient to accommodate such growth can be created.

Growth Rates by Industry for Greater Boston

The overall rate of job growth influences job growth in individual industries differently, depending on whether those industries are responsive to local or national and international demand. For industries where demand is primarily local,

such as construction, employment growth should scale up directly with the region's overall job and population growth. Jobs in these industries are driven by the multiplier effect – the impact of a new job added anywhere in the local economy is multiplied through the rise in local demand in other sectors. For industries where most employment is driven by local multipliers, employment growth occurs only in regions where overall job growth is occurring.

For industries where demand is primarily national or international, job growth is less impacted by the overall employment growth in the region. Industries where local multipliers explain little of the growth are more difficult to forecast, and in the absence of other information, the safest assumption might be that job growth will occur at a constant rate across metro areas. We estimate the extent to which an industry's employment is explainable by multiplier impacts by measuring how regional employment growth in each industry has correlated with total regional employment growth over the past two decades.

In order to determine industry allocation under each of the three models, we use the following assumptions: The *constant share model* assumes that industries in all areas will grow at the national industry growth rates predicted by the BLS. The *housing growth model* uses our estimates of the share of employment in each industry explainable by multiplier impacts to adjust regional industry growth rates based on our estimates of total employment growth. The *educated city model* contains both multiplier impacts as well as an effect measuring how the industry's recent metro area growth has correlated with the educational attainment of the adult population.

The ten-year industry growth rates for the Boston metro area under each of the three models are displayed in Table 3. The *constant share model* reflects BLS's expectations that health care and social assistance, education, professional and tech-

nical services, and construction will be the fastest growing industries nationally, that manufacturing will shrink, and that utilities, information, wholesale trade, and retail trade will grow slowly.

TABLE 3 Ten-Year Industry Growth Rates for Boston Metro Area, 2016-2026

Industry	Constant Share Model	Housing Growth Model	Educated City Model
Utilities	0.6%	-0.2%	0.9%
Construction	12.9%	11.2%	21.3%
Manufacturing	-6.0%	-6.1%	-4.6%
Wholesale Trade	2.5%	1.5%	2.4%
Retail Trade	2.6%	1.6%	5.3%
Transportation and Warehousing	7.3%	6.2%	7.1%
Information	1.9%	0.6%	7.7%
Finance and Insurance	5.8%	4.6%	10.1%
Real Estate, Rental and Leasing	5.9%	4.4%	8.3%
Professional and Technical Services	13.3%	11.7%	19.6%
Management of Companies and Enterprises	6.1%	5.0%	13.8%
Administrative and Waste Services	9.3%	8.2%	7.2%
Educational Services	14.2%	13.4%	24.4%
Health Care and Social Assistance	21.0%	20.0%	24.3%
Arts, Entertainment, and Recreation	8.9%	7.6%	13.8%
Accommodation and Food Services	8.4%	7.2%	13.5%
Other Services, except Public Administration	5.5%	4.4%	14.0%
Total Private Payroll Employment	9.4%	8.3%	13.7%
Compound Annual Growth Rate, Total Private Payroll Employment	0.9%	0.8%	1.3%

Source: BPDA Research Division Analysis.

The reduced growth rate in the *housing growth model* is reflected in modest declines across all industries, indicating that accounting for multiplier-driven employment growth has only a modest impact on the resulting industry distribution.

The faster overall growth projected in the *educated city model* is distributed less evenly across

industries. Higher overall job growth drives very rapid growth in construction as well as robust demand for recreation and entertainment and accommodation and food service. Employment in industries with highly educated workforces - education, professional and technical services, information, and finance and insurance - is projected to grow much faster than in the first two models,

while losses in manufacturing are diminished.

Examining how each of the three job growth scenarios impacts industry-level job growth reveals that higher rates of employment growth, even when skewed towards industries with higher education requirements, create employment opportunities across industries. The growth in construction jobs reflects that high rates of building activity would be necessary to realize this level of growth, and highlights the role that building new housing can play in promoting job growth across industries.

City Level Industry Job Projections

The industry distribution within Boston differs substantially from the broader region, with higher concentrations in finance, insurance, and education, and fewer jobs in manufacturing and retail trade. This distinctive structure has remained remarkably stable over the last decade and a half, with only a few industries exhibiting significant changes. Our model therefore assumes that Boston's share of regional employment within each industry will remain constant, with two exceptions.

First, there has been an increase in the proportion of the region's professional and technical services jobs located within city limits since 2010, growing from 25.7 percent to 29.8 percent in 2016. This trend reflects the emergence of urban orientation of recent tech growth as well as the remarkable rise of the South Boston Waterfront. We expect this urbanization of tech to continue though at a slowing pace. We project Boston's share of regional employment in this sector will increase by an additional 3.5 percent over the next decade, half the rate of recent growth.

Second, Boston's share of regional employment

in health care and social assistance has been trending downwards since 2010. Boston's hospitals remain the largest employers in this sector, but recent and anticipated employment growth is most rapid in home health care, where employment tends to be more geographically dispersed. We estimate that Boston's share of regional employment in health care and social assistance will fall by 1.7 percent over the next decade, equaling the recent pace of decline.

Combining the regional growth projections with Boston's predicted industry distribution produces estimated levels of private payroll employment in 2026. Because employment within the city is concentrated in faster growing sectors than in the region as a whole, the city's growth rate for total private payroll employment is slightly higher than the region, ranging from 1.0 percent to 1.5 percent annually.

Projections of total employment must also include estimates for government jobs and non-payroll jobs. Public employment, encompassing federal, state, and local government, fell sharply between 2001 and 2003, but has remained between 70,566 and 73,562 since. Therefore, government employment is projected to remain at its 2016 level.

Non-payroll employment has increased as a share of total employment from 14.2 percent in 2001 to 20.7 percent in 2017, though the last three years have shown no growth in the share of non-payroll jobs. After sizable increases in "gig-economy" services such as ride hailing in the first half of the decade, the trend towards non-payroll employment may be slowing. We project that the share of employment in non-payroll jobs will rise by three percent over the next decade, slightly slower than the four percent pace over the last decade.

Table 4 displays the resulting job growth for the city. Depending on the model, total employment is expected to rise from 796,211 in 2016 to between 904,121 and 945,577, a rate of between 1.3 and 1.7 percent annual growth. In each of the models, professional and technical services is expected to add the most jobs, slightly outpacing the jobs

added in health care and social assistance, which continues to be the city's largest sector. Education and accommodation and food service are also expected to see large absolute increases in employment, while construction employment grows rapidly as a share of its current level.

TABLE 4

Ten-Year Industry Job Growth for City of Boston, 2016-2026

Industry	2016 Employment	2016 to 2026 Change in Employment		
		Constant Share Model	Housing Growth Model	Educated City Model
Natural Resources and Mining	45	3	2	6
Utilities	1,579	10	-4	14
Construction	12,502	1,611	1,401	2,664
Manufacturing	7,078	-422	-432	-328
Wholesale Trade	8,124	202	124	195
Retail Trade	31,523	822	514	1,677
Transportation and Warehousing	16,765	1,224	1,043	1,183
Information	16,305	309	97	1,251
Finance and Insurance	69,032	3,983	3,209	7,004
Real Estate, Rental and Leasing	13,113	767	572	1,087
Professional and Technical Services	79,260	21,060	19,679	26,638
Management of Companies and Enterprises	8,181	502	407	1,133
Administrative and Waste Services	31,670	2,960	2,583	2,287
Educational Services	36,959	5,259	4,968	9,033
Health Care and Social Assistance	135,627	19,410	18,169	23,618
Arts, Entertainment, and Recreation	10,308	917	787	1,418
Accommodation and Food Services	59,892	5,012	4,302	8,105
Other Services, except Public Administration	21,224	1,166	941	2,973
Total Private Payroll Employment	559,187	64,793	58,362	89,960
Government Employment	71,586	0	0	0
Non-Payroll Employment (All Industries)	165,438	51,555	49,548	59,406
Total Employment	796,211	116,348	107,910	149,366

Source: Massachusetts EOLWD, BPDA Research Division Analysis.

Each of the growth scenarios envisions that the city's job growth will exceed that of the country as a whole, but all three are slower than the torrid pace of the past seven years, when total employment grew by 2.8 annually. This partly reflects cyclical economic conditions; while the period following the 2008 recession has seen a prolonged national economic growth, the likelihood of an economic downturn during the remaining portion of the projection period is high.

The moderated pace of employment growth is consistent with the BPDA's population projection

model, which envisions continued population growth through 2030, though at a slower pace than the 2010 to 2015 period. The coming years will also see a larger share of Boston's population age out of prime working years. Both our population and employment projections anticipate that the strong pace of housing growth in the city continues, meeting the target of 69,000 new units spelled out in the 2018 update to the Housing Boston 2030 Plan. Providing sufficient housing to accommodate population growth within the city and the region will enable Boston to continue to add jobs across sectors.



Source: Boston Leather District and Downtown, Alex MacLean Aerial Photography, 2014.

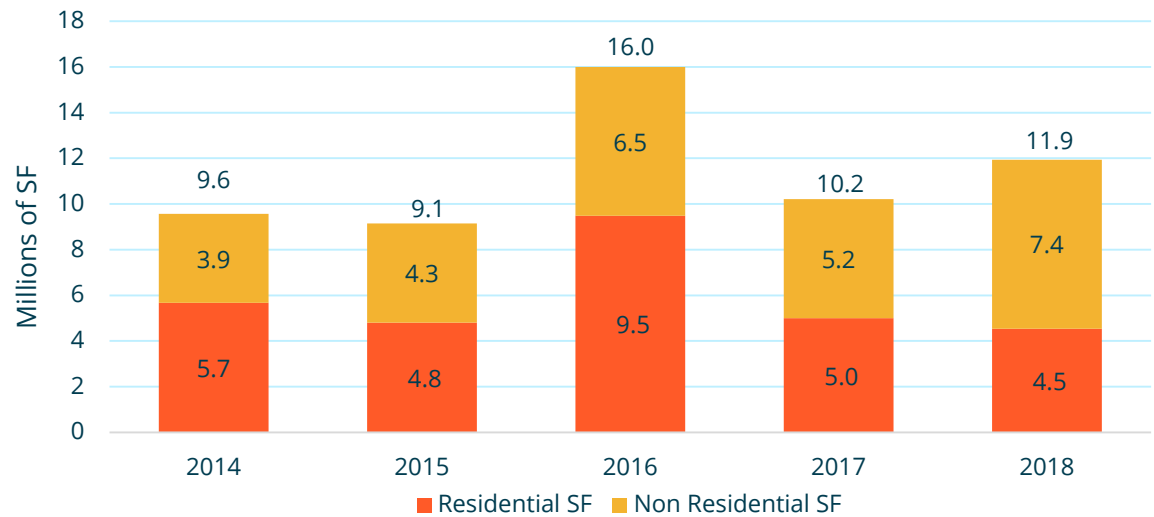
Real Estate Market Trends

Development Pipeline

The BPDA oversees a development review process (Article 80) that requires BPDA Board approval of all development projects larger than 20,000 square feet, or residential projects with 15 or more units. The volume of projects approved by the BPDA Board is an indicator of future real estate growth. From January 2014 through Decem

ber 2018, 56.8 million square feet of development was approved by the BPDA Board, half of which was residential development totaling 29.5 million square feet. In 2018, the BPDA Board approved 11.9 million square feet of new developments in the city, as shown in Figure 9.

FIGURE 9 Article 80 Development Approved by the BPDA Board, 2014 to 2018
In Millions of Square Feet



Source: BPDA Research Division, Pipeline Database, April 2019.

Construction

Construction employment has reached levels of the Big Dig era of the early 2000s, with approximately 20,000 construction workers in Boston in 2017.²² The total Article 80 construction hours worked in Boston suggest the level of construction activity is strong, but it may be stabilizing after the intense activity in 2017. There were over 3.6 million construction hours worked in 2018 on BPDA-Board approved development projects, a decrease of 6.4 percent from 2017 levels, but an increase of 12.1 percent and approximately 388,400 hours over 2016.

In fiscal year (FY) 2018, building permits issued in Boston brought \$52.8 million in revenue. The estimated construction activity during FY 2018 was \$6.2 billion, which is higher than the nine-year average. Table 5 shows annual building permit revenues and the estimated potential construction activity for fiscal years 2009 to 2018. FY 2017 had exceptionally high revenue yields, and FY 2018 has returned to revenue closer to the annual average of \$40.4 million in revenue.

TABLE 5 Boston's Building Permit Revenues and Estimated Construction Activity, FY2008-2018
In Fixed 2018 dollars

Year	Building Permit Revenues, in millions of dollars	Estimated Construction Activity, in millions of dollars
2009	\$31.6	\$3,713
2010	\$17.0	\$2,000
2011	\$26.2	\$3,081
2012	\$35.7	\$4,190
2013	\$31.6	\$3,710
2014	\$42.5	\$5,000
2015	\$54.8	\$6,446
2016	\$54.7	\$6,436
2017	\$63.5	\$7,467
2018	\$52.8	\$6,231
Boston Total	\$403.7	\$47,469
Annual Average	\$40.4	\$4,747

Note: Columns may not add due to rounding. Potential construction activity is estimated by dividing permit revenues by 0.85 percent, which is the midpoint between permit fees calculated at 0.7 percent of the first \$100,00 estimated value of development cost, and 1.0 percent for the remainder of development cost.

Source: City of Boston, Auditing Department Comprehensive Annual Financial Report, FY2018, BPDA Research Division Analysis.

Some noteworthy developments underway include:

- **Garden Garage** began construction in spring of 2018 on a 44-story residential building located in the West End. The new residential tower will have half a million square feet with 470 units and it will replace a former garage.
- **Whittier Choice** is a redevelopment of the existing Whittier Housing Development in Roxbury. The new building will be three stories with 387 units, with 121 income-restricted units, and bottom floor retail space.
- In Charlestown, a new mixed-use building at **100 Hood Park Drive** is under construction. The project will include a parking garage, and 75,000 square feet of retail, office and laboratory space and is located within the Hood Park business park.
- At **1785 Columbus Avenue** in Roxbury, an office building of approximately 139,200 square feet will serve Horizons for Homeless Children, as well as other social service programs.
- **Marine Wharf Hotel** located in South Boston will include the construction of a 320,000 square foot hotel with 411 rooms—245 rooms will be select-service and 166 will be extended-stay hotel rooms. The development includes 3,500 square feet of retail space and a parking garage.
- **The Residences at Forest Hills** is a six story, 235,000 square foot mixed-used development with 250 residential rental units, and 4,070 square feet of retail space in Jamaica Plain.

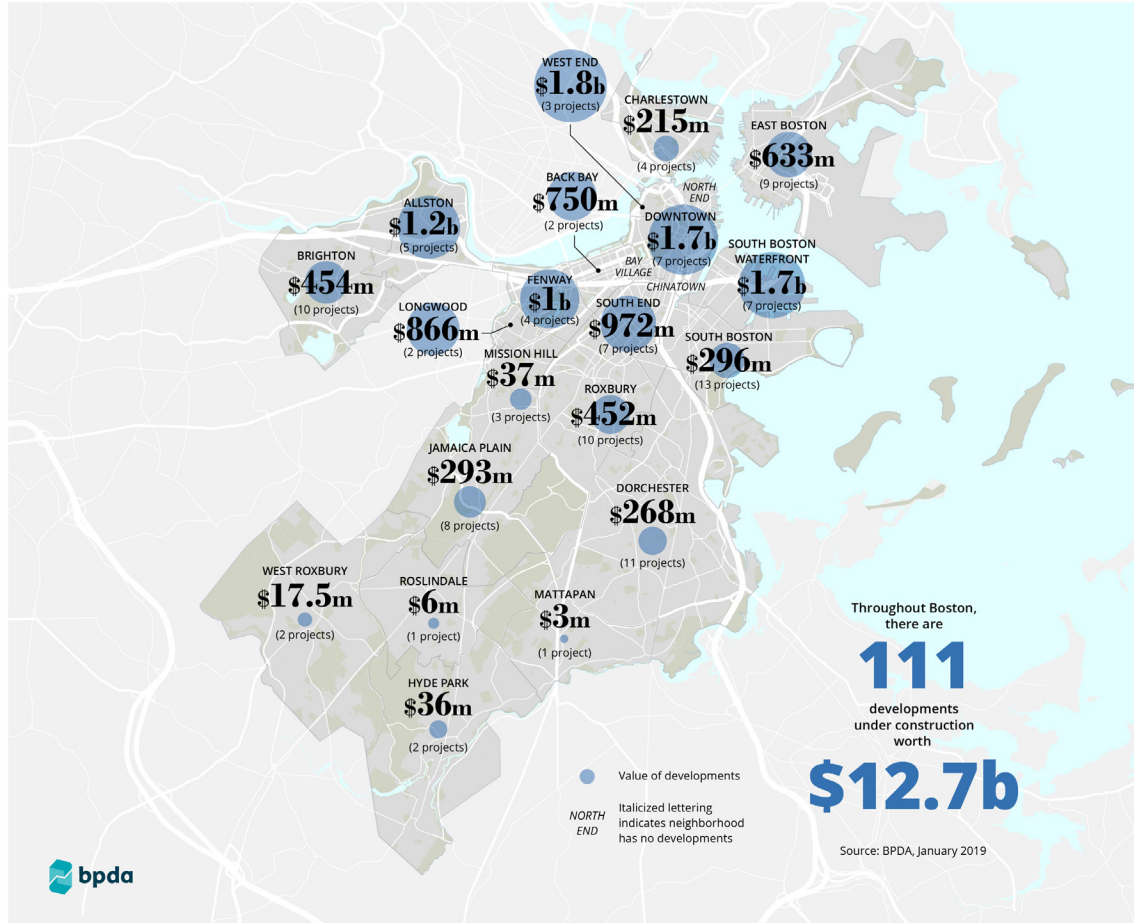


Source: *The Residences at Forest Hills*, Fort Point Associates, Inc., 2016.

The map below shows the neighborhood distribution of the 111 Article 80 developments under construction throughout the city as of January 2019.

MAP 1

Dollar Value of Under Construction Developments by Neighborhood, January 2019



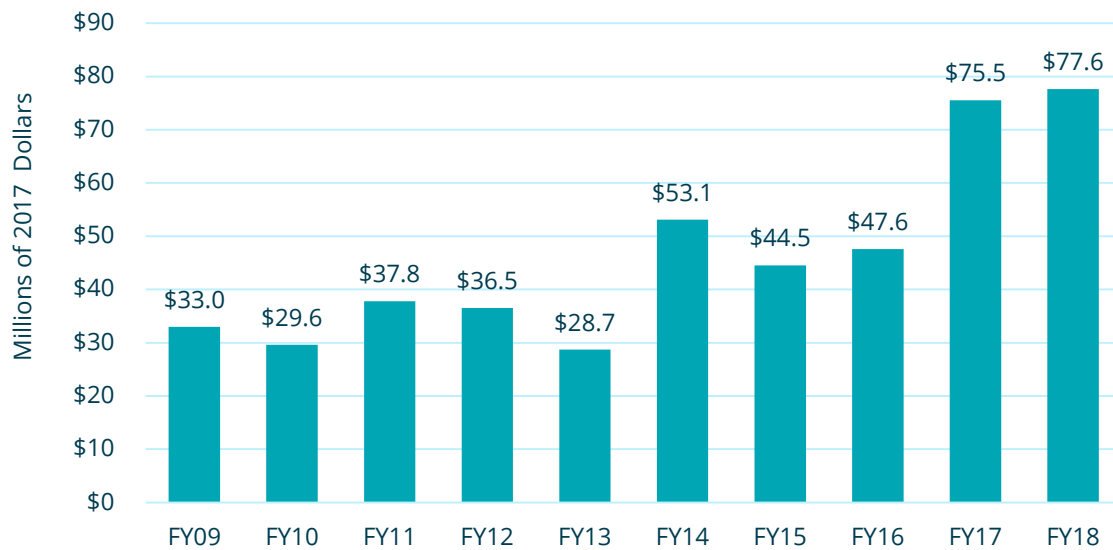
Source: BPDA Research Division Pipeline Database.
Map created by BPDA Office of Digital Cartography and GIS, January 2019.

Completed Developments

In Boston the timeline from approval to completion of a project has been falling since 2009. As of 2015, the average project time line from approval to completion was about three years. Most of the projects that are approved eventually become completed projects.

The property tax levy has grown strongly for the past five years as Boston continues to build. Figure 10 shows the growth of the new property tax levy for FY2009 to FY2018. In FY2018, levies grew by \$77.6 million due to major developments added to the tax rolls.

FIGURE 10 **New Property Tax Levy, FY 2009 to 2018**
In Fixed 2017 Dollars



Source: City of Boston Assessing Department, "Property Tax Facts and Figures: FY 2009 to 2018", BPDA Research Division Analysis.

Commercial Office Market Trends

Nationally, office employment is projected to grow by 1.6 percent in 2019.²³ Boston has experienced sustained job growth since 2010, particularly in industries such as professional, scientific, and technical services and finance and insurance that require commercial office space. Employment growth has driven increased demand for office space in Boston.

According to the BPDA development pipeline database the citywide inventory of commercial office space grew by 6.8 million square feet from 2014 to 2018. As of 2018, there is an approximate 112.9 million square feet of office space in Boston.²⁴

Certain neighborhoods in Boston are particularly dense with office space development. Downtown, which includes the Financial District, remains Boston's largest commercial office market with 48.5 million square feet of office space, followed by Back Bay with 17.6 million square feet and the South Boston Waterfront with nearly 14.0 million square feet. South Boston Waterfront is a rapidly growing neighborhood; it added the most new office space between 2014 and 2018, building nearly 3.0 million square feet. Allston and Brighton, characteristically residential neighborhoods, have added 2.1 million square feet of office space from 2014 to 2018.

TABLE 6

Boston's Inventory of Commercial Office Real Estate by Neighborhood, 2014-2018

Neighborhood	Existing Stock SF, 2018	Completed Construction SF, 2018	Completed Construction SF, 2014 to 2018
Allston & Brighton	3,177,500	325,000	2,145,900
Back Bay	17,565,600	-	-
Charlestown & East Boston	4,167,400	-	370,000
Downtown	48,453,900	12,900	235,700
Jamaica Plain & Roslindale & Mattapan	954,400	-	13,000
Longwood & Fenway	8,417,800	-	508,200
North End	2,218,500	-	187,200
West End & Beacon Hill	6,082,400	161,600	191,700
Roxbury & Dorchester	3,882,300	30,900	83,900
South Boston Waterfront	13,890,600	869,300	2,978,700
South Boston	486,100	-	-
South End	3,693,000	-	160,000
Boston Total	112,989,400	1,399,700	6,874,400

Note: Neighborhoods were adapted to BPDA standard neighborhoods from CoStar listed neighborhoods. Numbers were rounded to nearest 100, therefore columns may not sum to total.

Source: CoStar Office Statistics, BPDA Pipeline Database Research Division, 2019.

Major Recent Commercial Completions:

- A 17-story, 425,000 square foot office building was recently completed at **121 Seaport Boulevard** in the South Boston Waterfront. The building was completed in April 2018 and is 100 percent leased to tenants such as PTC, a company that develops Internet of Things (IoT) and Augmented Reality technology, and Alexion Pharmaceuticals. Both companies have moved their global headquarters to the building.
- **Pier 4 Phase 2** is a 15-story building in the South Boston Waterfront with approximately 377,000 square feet was completed in the spring of 2018. There is 360,000 square feet of office space, and the remaining square footage is dedicated to retail and restaurant space. The development also includes a one-acre public park.
- In Brighton, **Boston Landing's Auerbach Center** was completed in the summer of 2018, with 325,000 square feet of office and laboratory space—including a lease for Mass Innovation Labs, a training and practice sports facility for the Boston Celtics, 7,000 square feet of ground floor retail, and an underground parking garage.
- In Dorchester at **40 Enterprise Street**, the Pipefitters Local Union 537 opened a 73,000 square foot Training and Office Facility in the fall of 2018. The four-story building replaces the former headquarters and now has pipefitting training facilities, office space, classrooms, and auditorium space for up to 500 people.

Non-Traditional Office Space Development

Coworking spaces have been increasing in popularity in the past few years. These spaces are tailored to meet the needs of entrepreneurs, freelancers, startups, and even traditional businesses. At the national level, according to Jones Lang and LaSalle (JLL), flexible office inventory has grown to 51.2 million square feet as of 2017, which is five percent of the total market. The expansion of the flexible space/coworking market accounts for a quarter of total U.S. office space absorption from 2015 to 2017.²⁵

The Boston area is a top coworking space market within the nation.²⁶ In the past year, four new coworking spaces opened—the Wing, Venture Lane, WorkBar and Industrious.²⁷ In addition WeWork, one of the most widespread coworking companies, expanded its operations. WeWork acquired an additional 232,000 SF of space in the State Street Financial Center, and now operates 11 locations in Boston.²⁸

Office Vacancy

As shown in Table 7, third quarter office vacancies for 2018 were 6.8 percent citywide, up 0.1 percentage point from the previous year, flattening the trend of declining vacancies year-over-year since 2014. Within the city's submarkets tracked by Jones Lang LaSalle (JLL), four neighborhoods showed an increase in vacancy rates. Fenway had a dramatic increase to 7.1 percent, up from 1.4 percent the previous year. The Financial District,

South Boston Waterfront and South Station had increases below two percentage points. Since office square footage in Fenway has remained fairly constant for the past year, the increased office vacancy rate could be a result of tenants leaving due to renovations, like in the Landmark Center, or seeking opportunities in neighborhoods with larger office inventories, like Back Bay or the South Boston Waterfront. .

TABLE 7

Boston's Office Vacancy Rates by Neighborhood, 2014-2018

Neighborhood	2014	2015	2016	2017	2018
Back Bay	11.2%	11.0%	7.0%	8.7%	7.0%
Charlestown	11.9%	5.8%	3.7%	3.3%	0.7%
Fenway	5.5%	14.5%	2.6%	1.4%	7.1%
Financial District	12.7%	8.8%	8.8%	7.5%	7.7%
North Station	4.5%	4.3%	4.3%	2.7%	1.5%
South Boston Waterfront	7.3%	7.3%	7.3%	5.5%	6.6%
South Station	6.9%	7.4%	2.7%	2.7%	4.0%
Total Boston	10.9%	8.9%	7.5%	6.7%	6.8%

Note: Q3 office reports were used in 2018 data due to different categorization of neighborhoods in Q4 reporting.

Source: JLL "Office Statistics: Boston", BPDA Research Division Analysis.

Office Rents

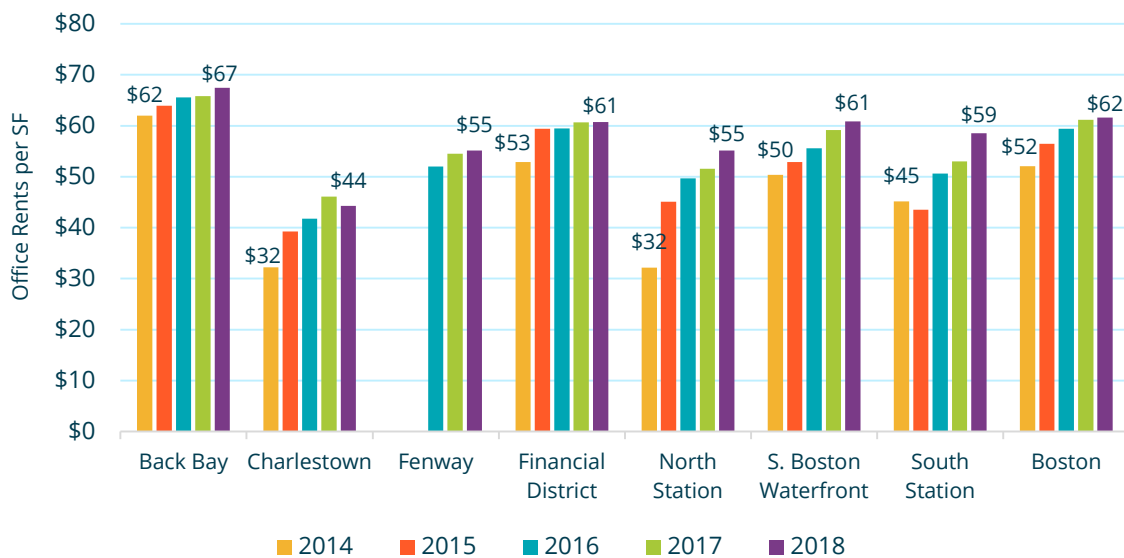
As shown in Figure 11, the Back Bay office submarket continues to command the highest rents in the city at \$67 per square foot, which is an increase of five dollars from 2014. Companies show continued interest in Back Bay, including a fast growing internet retailer, Wayfair, who leased an additional 350,000 SF of space in Back Bay in 2018, and is still looking for another 250,000 SF office space in the neighborhood to accommodate its expected growth to 10,000 employees.²⁹ DraftKings, Inc., a fantasy sports company, moved its headquarters from Downtown to Back Bay. The company recently leased 105,000 SF of space in the same building as Wayfair, effectively doubling the size of its headquarters and allowing room for its 200 new employees.³⁰ Overall in Boston, rent per square foot increased slightly to \$62, with South Station seeing the largest rent increase

from 2014. Rents in the Financial District remained stable at \$61, while rents in the South Boston Waterfront rose nearly two dollars per square foot to \$61, closing the gap in rent between the two submarkets.

From 2017 to 2018, the South Boston Waterfront and Back Bay neighborhoods had a growth in net absorption of office space. In 2018, Back Bay had a net absorption of 443,000 square feet, at an annual absorption rate of 3.5 percent. The South Boston Waterfront neighborhood also had a high net absorption (790,700 SF) in the same time period, at a rate of 8.0 percent. The absorption rate trends in these neighborhood submarkets indicate a high level of demand for space in comparison to other Boston neighborhoods.

FIGURE 11 Boston's Office Asking Rents by Neighborhood, 2018

In Fixed 2018 Dollars



Source: JLL "Office Statistics: Boston" and BPDA Research Division Analysis.

Future Commercial Office Development

It is likely that commercial office space in Boston will continue to grow through 2019. In 2018, the BPDA approved 3.0 million square feet of new office space. These office developments will come on line over the coming years. According to Colliers International, it is predicted that new commercial office space clusters will emerge in neighborhoods like Newmarket/Dorchester, East Boston, Charlestown, and Allston/Brighton, though these emerging markets may not be fully realized for development in the current economic boom.

Approved projects with office space include:

- **115 Winthrop Square** in Downtown, will be a 1.65 million square foot mixed-use tower, which will replace the former city-owned Winthrop Square parking garage. The building will include 750,000 square feet of office space, in addition to residential, retail, restaurant and community space. The Winthrop Center will be the tallest building in Downtown and among the tallest in the city.
- In the South End, the **South End Exchange** is a \$1.45 billion redevelopment of the former Boston Flower Exchange. The project includes over 600,000 square feet of office space, in addition to retail, technological, civic and incubator space.
- The first phase of redeveloping **Suffolk Downs**, a historic horse race track in East Boston, was approved in 2018 and will include two office buildings totaling 520,000 square feet.
- Changes to **Phase 3 of the Hub on Causeway** project in the West End, which consists of a 651,500 office tower, were also approved. Verizon, Boston Properties and Delaware North announced their tenancy at the Hub on Causeway in July 2018.
- In Dorchester, the former Boston Globe Headquarters will be renovated to a 695,000 office building dubbed the BEAT (the **Boston Exchange for Accelerated Technology**), with creative office, technology and life science uses. The BEAT was approved in April 2018 and is currently under construction.
- In South Boston Waterfront, at **10 Dry Dock Avenue**, a 13-story 298,700 square foot office building near the Innovation and Design Building went under construction in April 2018. The project will include ground-level retail, bicycle storage, locker rooms with showers and a 12,000 square foot public plaza.
- In the South End, an office building of 218,500 square feet at **321 Harrison Avenue**, near the Ink Block development, was also permitted in April 2018. It will sit atop a 300 car garage and include open green space with outdoor seating.

Residential Real Estate Market

Boston's growing population is facing a pressing need for adequate and affordable housing. BPDA population projections estimate Boston's 2030 population will be 759,000 residents, and the current housing stock would be unable to accommodate such growth. The plan *Housing A Changing City: Boston 2030* (HB2030) set a new target to build 69,000 new units, 16,000 of which would be income-restricted, between 2014 and 2030.³¹ In 2018, the City permitted 29,385 new housing units towards that target, which places the City above the target goal of 21,829 by the end of 2018.³² Overall, 3,733 new housing units were built in Boston in 2018.³³

Major residential completions of 2018:

- **Pier 4** in the South Boston Waterfront neighborhood completed construction of 625,000 square feet with 383 residential units. In addition to these residences, the development also includes a 314,700 square foot hotel.
- Construction of **345 Harrison Avenue** in

the South End brought 563,000 square feet of residential space and 40,000 SF of retail space to the neighborhood. The building has a total of 585 residential units, 58 of which were income-restricted units.

- **The Kasanof Bakery Homes** in Roxbury was completed in 2018. The project is a four story, 48 unit apartment building with approximately 135,350 square feet, 3,500 square feet of which is retail. Of the 71 residential units, 64 are income-restricted.
- **Telford 180** is a residential project located in Brighton that completed construction on 348 residential units, 49 of which are income restricted.
- In Fenway, construction was completed on **The Pierce**, a 30 story mixed-use development with 369,960 square feet of residential space and 20,500 square feet of retail space. There are a total of 349 residential units.

Residential Vacancies

Despite the growing housing stock, residential vacancy rates have been relatively stable over the past six years. The share of housing units counted as vacant as defined by the U.S. Census Bureau was 8.6 percent in 2017, up slightly from the prior year, but on par with 2015.³⁴ This inclusive definition of vacancy includes units for rent or sale, those rented or sold but not yet occupied, those for seasonal or occasional use, and those held off market because of legal proceedings, or because the units are being repaired or renovated.

The supply of housing units available for rent or sale remained tight. The rental vacancy rate – the number of rental units available for rent as a share of housing units either available for rent or currently rented – was 2.8 percent in 2017. This low level of vacancy puts upward pressure on rents. Housing experts estimate that rental vacancy rates around 7 percent are more consistent with stable rent levels.³⁵ The 2017 homeowner vacancy rate of 1.8 percent was up compared to extreme lows of 0.4 to 0.8 percent in 2013 and 2014, reaching a level more consistent with price stability.

Figures 12A and 12B present vacancy by neighborhood using two different measures. Figure 12A, using the more expansive definition that includes all units counted as vacant by the Census Bureau, shows the share of vacant units varying between

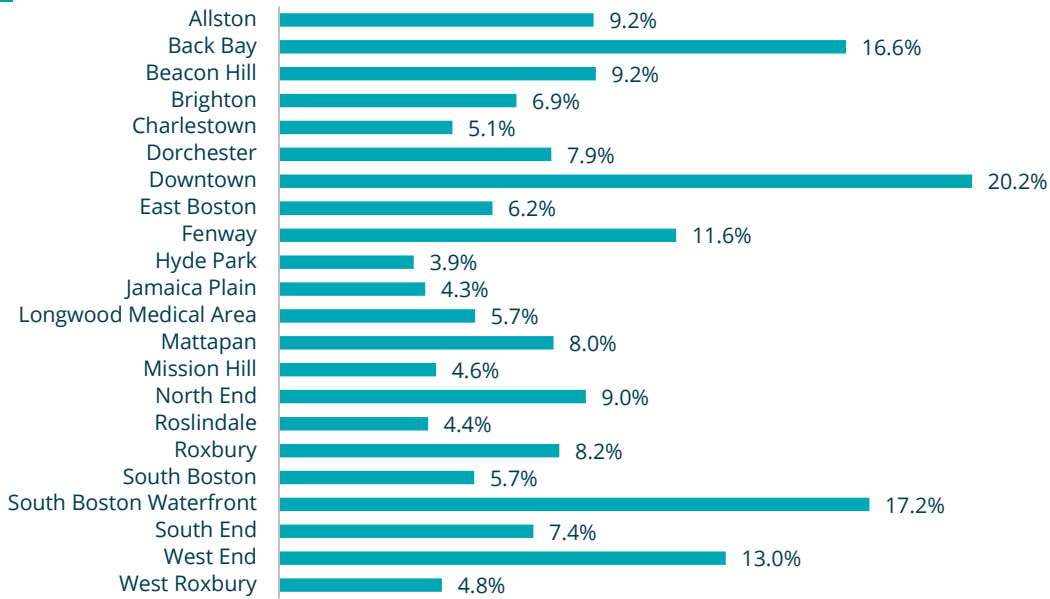
3.9 percent and 20.2 percent, with the lowest rates observed in primarily residential neighborhoods like Hyde Park, Jamaica Plain, and Roslindale.

The higher rates in neighborhoods located in or near Downtown partly reflect the high volume of recent housing completions in those neighborhoods. New units may take several months to lease up and become occupied, elevating the rental vacancy rates shown in Figure 12B. Even amidst the rapid pace of recent development, no neighborhood's rental vacancy rate exceeds 6.4 percent.

Also contributing to the overall vacancy rates in Figure 12A is the share of units held for seasonal or occasional use. Downtown (8.2 percent), Back Bay (7.6 percent), and the South Boston Waterfront (4.1 percent) have the highest shares of housing units held for seasonal or occasional use, contributing to the higher shares of units counted as vacant in those three neighborhoods. Units held for use as short-term rentals are likely pushing up the vacancy rate across neighborhoods. To help address this, a citywide ordinance passed in June 2018 established new guidelines for short-term rentals and required registration of units being used as short-term rentals starting in January 2019.

FIGURE 12A

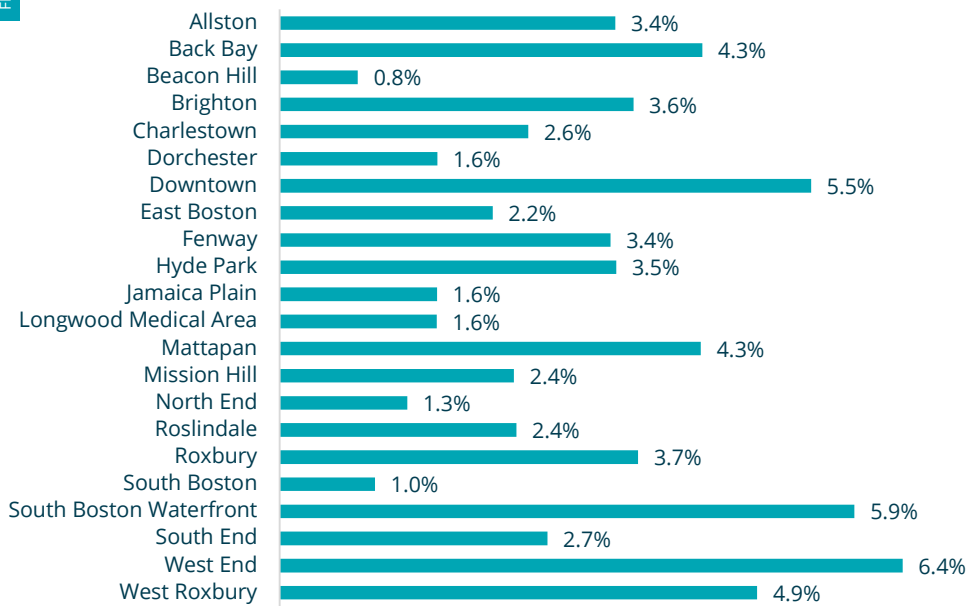
Vacant Units (All Categories) as a Share of Housing Units by Neighborhood, 2017



Source: U.S. Census Bureau ACS 5-year estimates, 2013-2017, BPDA Research Division Analysis.

FIGURE 12B

Rental Vacancy Rate by Neighborhood, 2017



Source: U.S. Census Bureau ACS 5-year estimates, 2013-2017, BPDA Research Division Analysis.

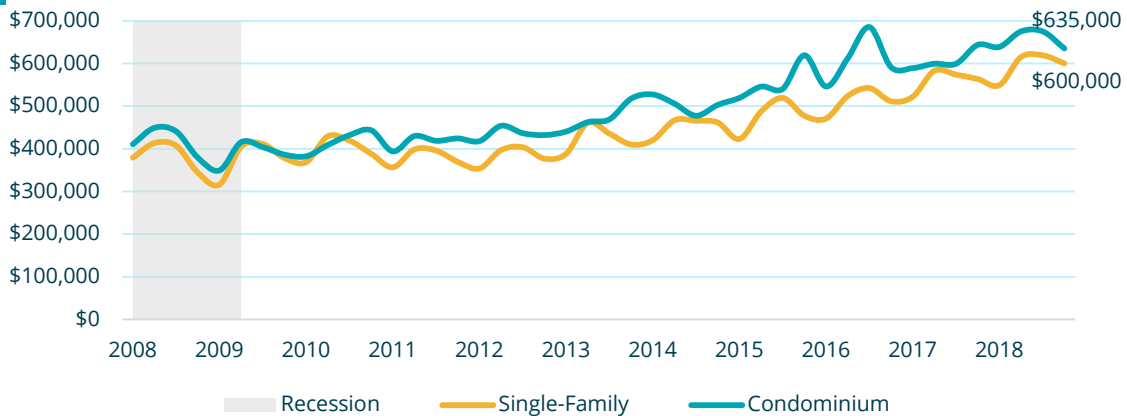
Housing Costs

Median sales prices have continued to rise, along with sales volume. Single-family sales prices in Boston grew annually at a rate of 4.9 percent from 2010 to 2017, according to data prepared by Boston's Department of Neighborhood Development. Condominium median sales prices had an average real annual growth rate of 5.5 percent. From

2017 to 2018, there was 6.3 percent real growth in single family sales prices, reaching \$600,000 in Q4 2018, and 7.9 percent real growth in condominium sale prices, reaching \$635,000 in Q4 2018.³⁶ Additionally, sales volume for single family and condominiums increased by 6.5 percent from 2017 to 2018.

FIGURE 13 Quarterly Median Residential Sales Prices

In Fixed 2018 Dollars



Note: Rounded to the nearest multiple of 50.

Source: City of Boston, DND using Banker and Tradesman Data, BPDA Research Division Analysis.

Residential Rents

Rents have risen more slowly than sales prices over recent years. From 2010 to 2017, real median gross rents increased by an annual average of 3.2 percent.³⁷ Gross rents are tenants' out-of-pocket costs in both market rate and subsidized housing units and are typically lower than advertised market rents for newly available units. The U.S. Census ACS housing data show the median gross monthly rent in Boston for 2017 was \$1,774. In real terms this is an increase of 3.4 percent over 2016.

Boston's Department of Neighborhood Development tracks rental listings to better understand recent trends in the rental market. Because the

sample of rental listings in a given month or year does not necessarily represent the composition of units in Boston as a whole, DND uses a weighted average methodology to compare rents across time periods. By holding the composition of units by bedroom and neighborhood constant between the comparison periods, this methodology isolates changes in rent levels from other changes in the sample. For instance, one year's data may contain a higher ratio of three bedroom to one bedroom units, or be more heavily weighted towards more expensive neighborhoods. Weighted averages adjust for any skewing in the sample by geography or bedroom type.

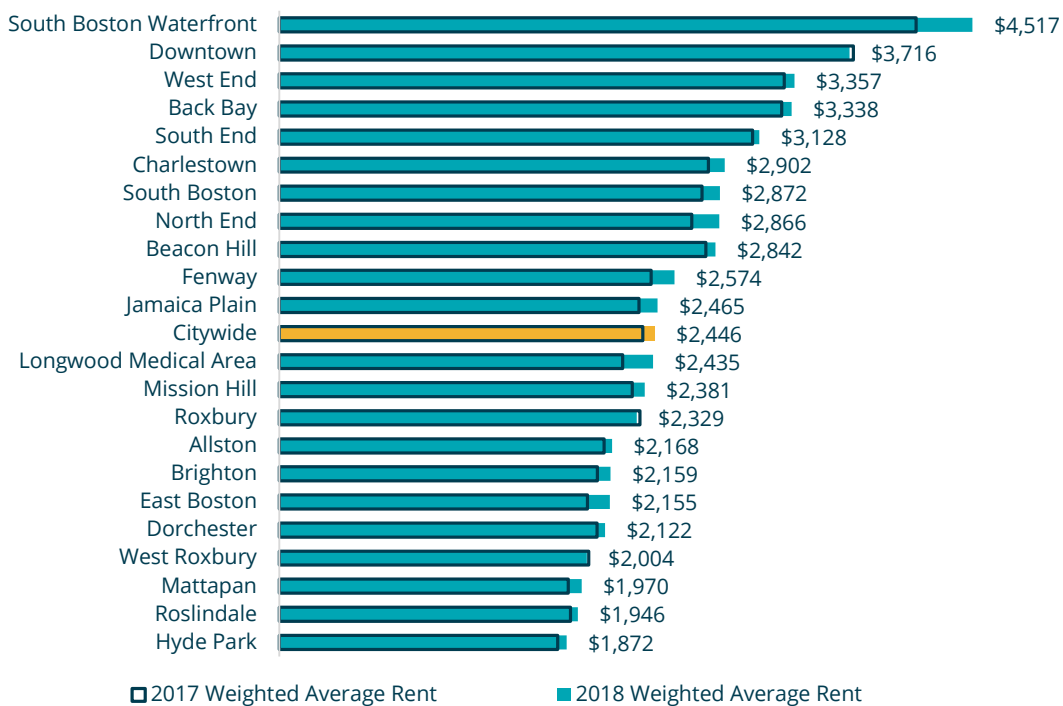
To do the weighting, DND calculates a "total value" for each neighborhood and bedroom type by multiplying the average listing rent by the number of occupied rental housing units from the 2013-2017 5-year ACS. The total value for 0 to 3 bedroom units is combined, then divided by the total number of occupied 0 to 3 bedroom units in that neighborhood in the ACS to get the final weighted average.

The weighted average advertised rent for an

apartment in Boston was \$2,446 in 2018, up 3.3 percent from the year before.* The highest advertised rents are in the South Boston Waterfront (\$4,517) and Downtown (\$3,716), while Hyde Park (\$1,872), Roslindale (\$1,946), and Mattapan (\$1,970) have the lowest rents. The largest year-to-year increases, 7 percent or higher, were observed in the South Boston Waterfront, Longwood, the North End, and East Boston, while Downtown, Roxbury, and West Roxbury saw advertised rents decrease by 1 percent.

FIGURE 14

Monthly Weighted Average Rental Listings by Neighborhood, 2017-2018



Source: City of Boston, DND using Multiple Listing Service (MLS) and Rental Beast.

* This revised analysis of year-over-year rent growth between 2017 (Q1-Q4) and 2018 (Q1-Q4) replaces the analysis in a previously released version of this report that covered year-over-year growth between 2016Q4-2017Q3 and 2017Q4-2018Q3. The previous analysis showed a larger increase in rents at the citywide level and in many neighborhoods. This reflected an anomalously high volume of listings at low rent levels in the data received for 2016Q4 from our external data provider, data that was inconsistent with trends seen in any other quarter. By replacing 2016Q4 with the more recent 2018Q4, the analysis presented here more accurately captures the trajectory of rent increases over the last year.

Future Residential Development

In 2018 alone, the BPDA Board approved 11.9 million square feet of development including 4.5 million square feet of new residential development, which was on par with the approved square footage for 2017. The total approved residential square footage translates to a total of 4,219 potential new housing units across the city and of

these units, 771 will be income-restricted units.³⁸ The largest projects by number of units include Tremont Crossing in Roxbury (727 units), Seaport Square in South Boston Waterfront (700 units), and new residential buildings near St Gabriel's Monastery and Church in Brighton (652 units).



Source: Jamaica Plain, Alex MacLean/ Landslides Aerial Photography, 2014.

SPOTLIGHT SECTION

Boston's Higher Education Industry

Introduction

Boston's colleges and universities attract top students and faculty from around the world, and are a driving force behind the city's growing economy. Higher education institutions train Boston's labor force across disciplines, employ teaching, administrative, and support staff, and contribute research dollars that support developments in medicine, business, and technology. However, recent national trends have raised concerns about the stability of the higher education sector in Boston, due to declining enrollment, a falling birth-rate, rising operational costs, and school closures. This Spotlight Section outlines the economic contributions of higher education to the city, evaluates factors influencing enrollment at Boston institutions, and discusses responses that Boston colleges and universities may take to adapt to the changing education market.

Boston's Higher Educational Institutions

Boston is home to more than 30 degree-granting institutions, including four public universities (UMass Boston, Massachusetts College of Art and Design, Bunker Hill Community College, and Roxbury Community College), two for-profit institutions (Bay State College and New England College of Business and Finance), and 26 private, non-profit institutions.³⁹ In 2017, the education industry in Boston contributed to four percent of Boston's Gross City Product (\$4.6 billion) via labor income, business taxes, and capital income,⁴⁰ with economic benefits occurring in the following areas: employment, research funding, workforce development, tax contributions, and real estate development.



Source: Massachusetts College of Pharmacy and Health Sciences, Mission Hill, 2017.

Economic Impact of Higher Education

Employment

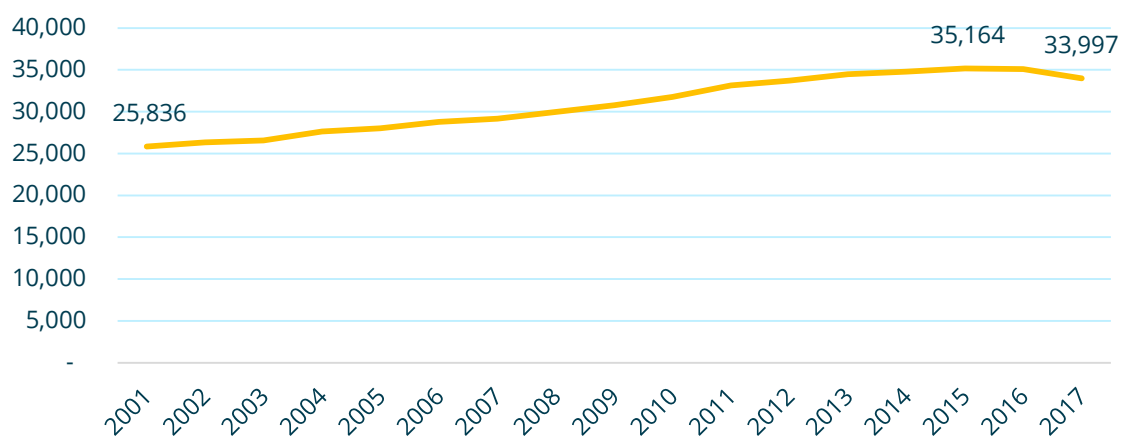
Colleges and universities currently employ 34,000 payroll workers in Boston, comprising eight percent of total payroll employment in Boston and 64 percent of education jobs. Payroll employment in Boston colleges and universities grew by 36 percent from 2001 to 2015, before declining by three percent from 2015 to 2017. According to the EOLWD for Massachusetts, Boston is projected to add around 940 jobs in the education industry overall between 2017 and 2019 and 8,700 jobs between 2016 and 2026. The median yearly salary for employees at colleges and universities in 2017 was \$82,620, an increase of \$4,775 in real terms (2018 dollars) since 2010.⁴¹

Research Funding

Boston's major research universities bring in millions of dollars in research funding that ultimately filter throughout Boston's economy. For example, in fiscal year 2018, the National Institutes of Health (NIH) awarded Harvard Medical School \$209 million, BU Medical School \$140 million, and Harvard School of Public Health \$125 million.⁴² These funds support local jobs as well as technological innovations that may then be transferred to the private sector, contributing to Boston's biotech and start-up economy. For example, in 2018, NIH funding supported discoveries at Harvard Medical School that may lead to improved treatment of strokes and diabetes, while researchers at the Boston University School of Medicine identified more effective treatments for opioid overdoses.⁴³

FIGURE 15

Payroll Employment in Boston Colleges and Universities



Source: U.S. BEA, Massachusetts EOWLD, BPDA Research Division Analysis.

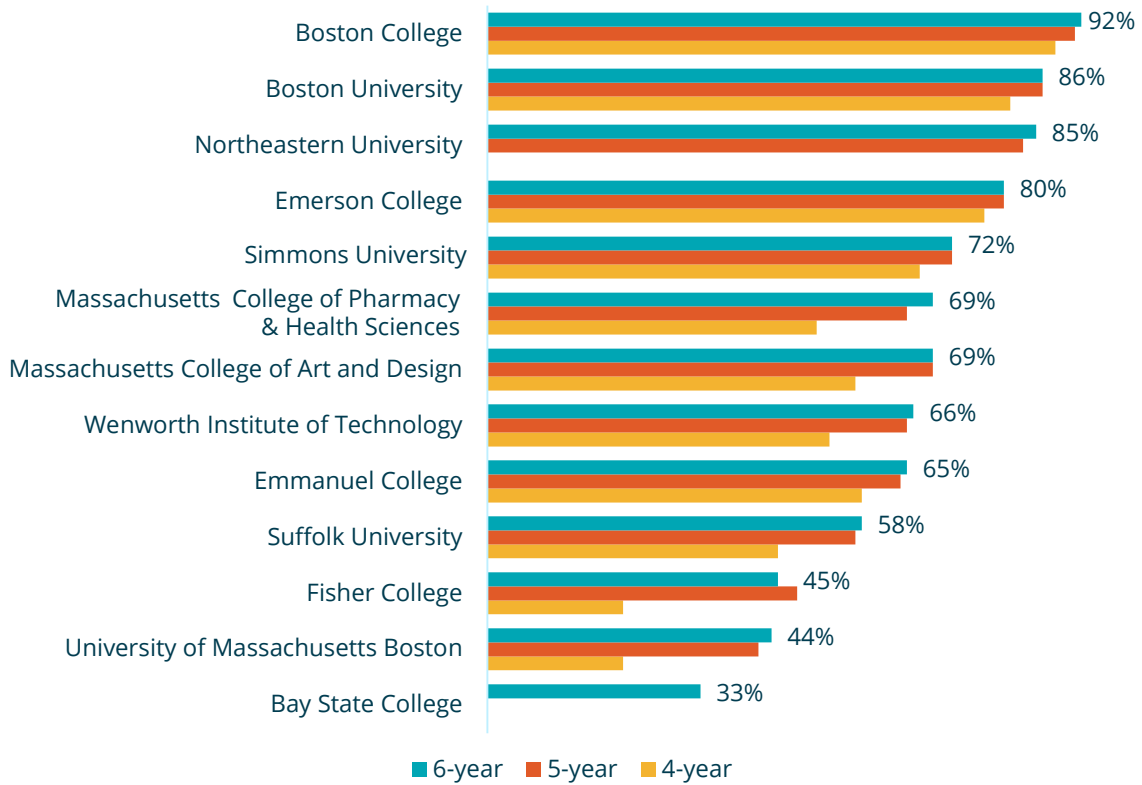
Workforce Development

Boston colleges and universities train future workers in a variety of fields and skill levels. Institutions such as Bunker Hill Community College, Roxbury Community College, Bay State College, Fisher College, Urban College of Boston, Cambridge College, and Benjamin Franklin Institute offer Associate's degrees and certificate programs, often with part-time study opportunities in the evening or on weekends for students who attend school while working.

The majority of colleges and universities in Boston offer four-year undergraduate degrees. A selection of these colleges and their graduation rates are shown in Figure 16 below. Notably, schools with a high share of part-time undergraduate degree students (such as Fisher College at 49 percent and UMass Boston at 22 percent) have lower graduation rates.

FIGURE 16

Graduation Rates for Boston 4-Year Colleges and Universities

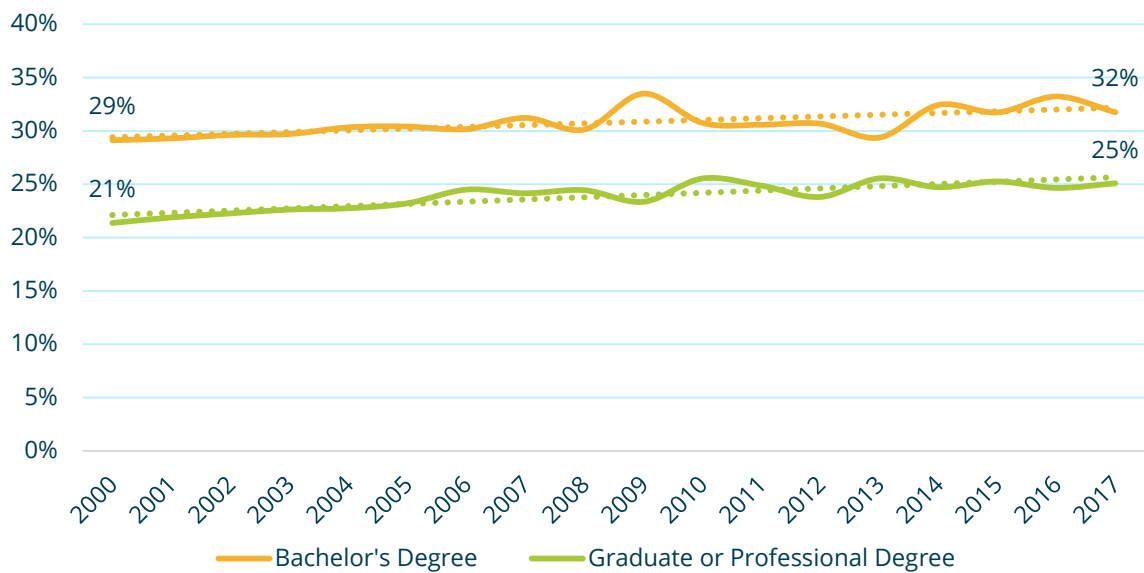


Note: Only 4-year colleges for which data are available are presented. Percent is for the six year graduation rate.
Source: U.S. News and World Report, 2019.

Other Boston institutions provide graduate level education or specialized training. Harvard’s medical, dental, and public health schools, Tufts medical school, MGH Institute of Health Professions, Massachusetts College of Pharmacy and Health Sciences (MCPHS), Simmons, and New England College of Optometry prepare students for careers in health care. Suffolk, Boston University, Boston College, Northeastern, and New England Law all offer legal training, while Harvard, Northeastern, BU, Simmons, Suffolk, and UMass Boston offer graduate business degrees. Massachusetts College of Art and Design, Emerson College, Boston Conservatory at Berklee, Berklee College of Music, Boston Architectural College, New England Conservatory, and the School of the Museum of Fine Arts at Tufts train arts practitioners across many disciplines.

Boston employers are increasingly hiring workers with college degrees; the share of Boston’s workforce that has a Bachelor’s degree or higher increased from 50 percent in 2000 to 57 percent in 2017. Employers frequently recruit graduates from local universities, but due to the high proportion of students that attend Boston institutions from other states and countries, there are more graduates than jobs to fill – the BPDA estimates that around 26 percent of Bachelor’s degree candidates migrate out of Greater Boston after graduation.⁴⁴ Nevertheless, Boston companies strongly benefit from having a large pool of well-trained students to draw from each spring.

FIGURE 17 Educational Attainment of People Working in Boston



Note: Massachusetts residents only. 2012 to 2017 data include those working in all of Suffolk County. Values 2001 to 2005 are interpolated.
 Source: U.S. Census Bureau, ACS 1-year estimates 2006 to 2017, PUMS, BPDA Research Division Analysis.

Taxes

Non-profit colleges and universities do not currently pay property taxes but instead contribute a substantially smaller payment in lieu of taxes (PILOT). The City of Boston requests PILOT contributions that are 25 percent of what the institution might expect to otherwise pay in real estate taxes, half of which can be paid through in-kind community benefits for Boston residents. In fiscal year 2018, non-profit educational institutions in the Boston fulfilled 72 percent of the \$55.6 million PILOT payments requested by the City.⁴⁵

Real Estate Development

Boston colleges and universities undergoing campus expansions and renovations support construction jobs, renovate the public realm, and offer new, publicly-accessible spaces to city residents. Over the past five years, 3.38 million square feet of postsecondary educational space has been constructed, including the following projects:

- **Boston College** built a recreation center, a field house, the McMullen Museum, a dorm, and office and conference space in Brighton.
- **Boston University** built Myles Standish Hall, the Center for Integrated Life Sciences and Engineering, and a Law School space in the Fenway, as well as the Moakley Cancer Center in the South End.
- **Emerson College** built a new residence hall in Downtown.
- **Emmanuel College**, located in the Longwood neighborhood, completed Julie Hall—a 19-story residential hall on the campus. Completed in the summer of 2018, the building is 267,000 square feet and it has 691 beds for students in addition to meeting rooms, convenience store, and lounges.
- **Harvard University** completed Tata Hall, the Chao Center, Esteves Hall, and the Pagliuca Harvard Life Lab in Allston.
- **New England Conservatory** built a student life and performance center in Fenway.
- **Northeastern University** built the Interdisciplinary Science and Engineering Complex in Roxbury and Grandmarc Residence Hall in Fenway.
- **UMass Boston** in Dorchester finished its first dorm buildings with over 1,000 dorm beds and University Hall with classroom and office space.
- **Wentworth Institute of Technology** built a residence hall in Fenway and an academic building in Mission Hill.

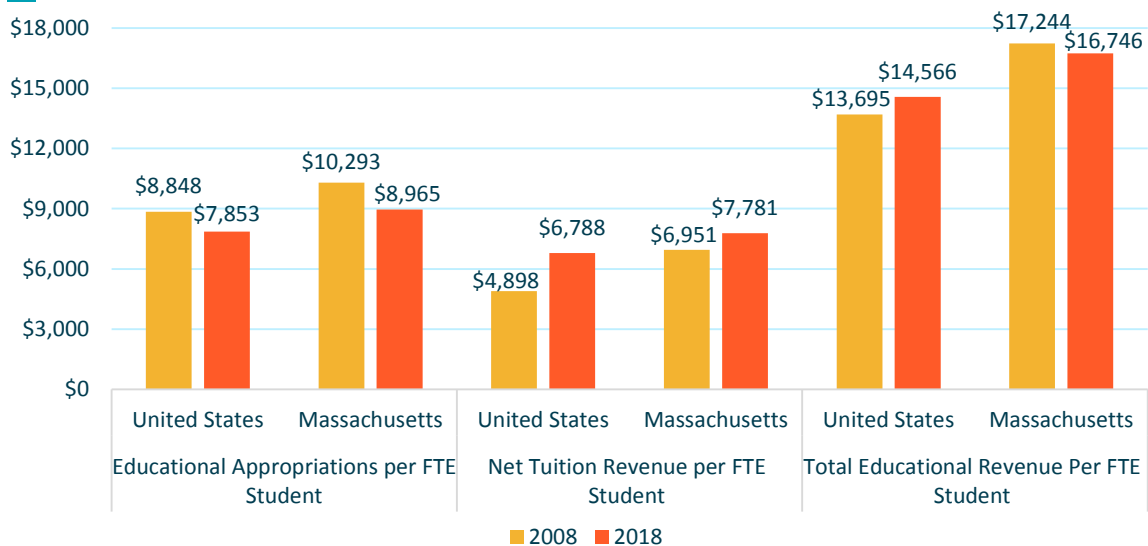
Factors Affecting Higher Education Enrollment

National Trends: Challenges in the Industry

The higher education industry has recently come under public scrutiny due to rising costs and declining revenue. For the past two years, Moody's has issued a negative outlook for the higher education sector, citing rising expenses that are outpacing tuition increases, competition over fewer students, public skepticism over the value of higher education, and an uncertain regulatory environment that may limit access to student loans, student visas, and research funding.⁴⁶ Moody's projects expenses will grow around four percent due to rising labor and health care costs and infrastructure and programmatic investments, more than the expected 3.7 percent growth in operating revenue.⁴⁷

A major contributor to the revenue challenges faced by public colleges and universities is a decline in appropriations for higher education. Total appropriations decreased from \$90.3 billion in 2008 to \$85.8 billion in 2018, while full-time equivalent (FTE) enrollment increased from 10.2 million to 10.9 million, leading to a decline of 11.2 percent (\$8,848 to \$7,853) in public dollars per student.⁴⁸ Colleges and universities responded by raising tuition rates, producing an increase in net tuition revenue per student of 38.6 percent (\$4,898 to \$6,788). Appropriations as a share of total revenue per student have decreased from 65 percent in 2008 to 54 percent in 2018.

FIGURE 18 Appropriations, Tuition, and Revenue per Full-Time Equivalent Student, 2008 & 2018
In Fixed 2018 Dollars

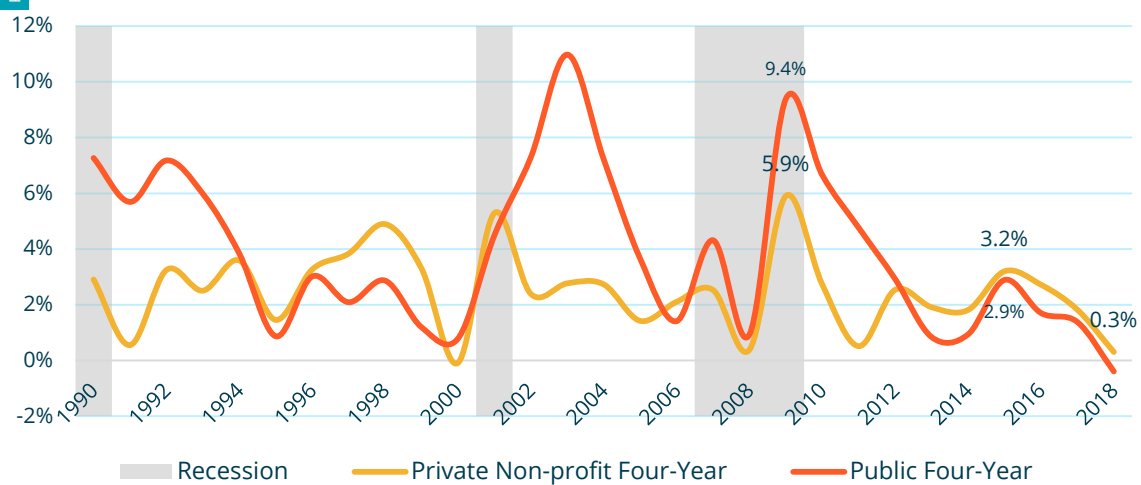


Source: State Higher Education Executive Officers Association, "State Higher Education Finance: FY 2018," 2019.

Nationally, tuition rates have outpaced the decline in appropriations, with total revenue per student increasing 6.4 percent to \$14,566 between 2008 and 2018.⁴⁹ However, a recent flattening of tuition growth, combined with a decline in enrollment, poses a threat to continued revenue growth. Tuition actually declined 0.4 percent at public four-year institutions from 2017 to 2018. After reaching

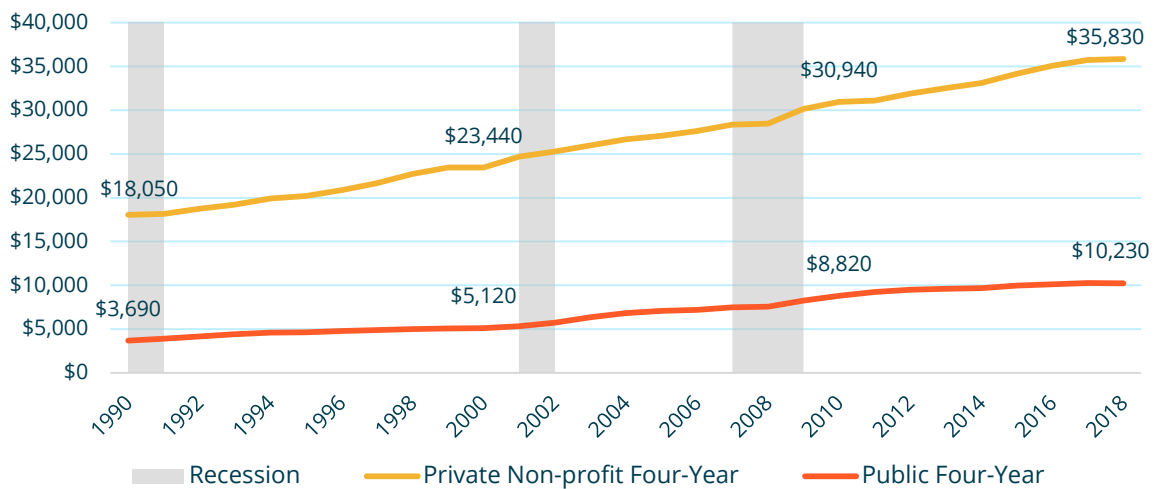
growth rates of 5.9 percent in 2008 and 3.2 percent in 2015, tuition and fees at private non-profit institutions increased by only 0.3 percent between 2017 and 2018.⁵⁰ This suggests that colleges and universities may have a lesser ability to make up for decreased government investment in coming years.

FIGURE 19 Annual Percent Change in Tuition and Fees in U.S.



Source: College Board, Annual Survey of Colleges; "Trends in Student Aid 2018", NCES, IPEDS Fall Enrollment and Student Financial Aid data.

FIGURE 20 Average Tuition and Fees in U.S.
In Fixed 2018 Dollars



Source: College Board, Annual Survey of Colleges; "Trends in Student Aid 2018", NCES, IPEDS Fall Enrollment and Student Financial Aid data.

Revenue challenges are particularly concerning given a recent fall in college enrollment. Though enrollment in institutions of higher education grew 37 percent from 2000 to 2010, it fell seven percent between 2010 and 2016 as the economy recovered and jobs became more widely available.⁵¹ Nationwide, the largest declines have been in the for-profit sector, where enrollment fell 47 percent (1.7 million to 915,000 students) between 2010 and 2016, in large part due to increased regulatory scrutiny over false advertising, poor student outcomes, and high costs.

Enrollment at public nonprofits declined by four percent (13.7 million to 13.1 million) while enrollment at private nonprofit institutions increased by six percent (2.7 million to 2.8 million) from 2010 to 2016. Despite recent enrollment declines, some analysts predict a modest rebound over the coming decade. The National Center for Education Statistics projects a three percent increase in enrollment at degree-granting post-secondary institutions from 2016 to 2027.⁵² This projection includes a 4.2 percent increase in enrollment at public institutions and flat enrollment at private institutions.

The following sections examine how trends in tuition, appropriations, and enrollment have impacted the Boston education market, analyze factors likely to influence future enrollment at Boston institutions, and highlight revenue-increasing measures underway.

Tuition Growth in Massachusetts

As shown in Figure 16, Massachusetts has seen an even greater decline in appropriations and revenue per student than at the national level. State appropriations for Massachusetts decreased 12.9 percent from \$1.53 billion in 2008 to \$1.47 billion in 2018 at the same time that full-time equivalent enrollment increased by 15,385, leading to a loss of \$1,328 per student.⁵³ The decline in appropriations per student outweighed the increase in net tuition per student, meaning that total revenue per student in Massachusetts fell by around \$500 between 2008 and 2018. The share of revenue derived from appropriations declined from 60 percent to 54 percent.

Though average in-state tuition at public four-year institutions in Massachusetts increased 40 percent from 2008 to 2018, growth has recently slowed, increasing less than one percent between 2017 and 2018.⁵⁴ Revenue challenges contributed to the closure of some small colleges in the area, including Mount Ida College in Newton and Newbury College in Brookline, sparking concern over the stability of Boston area institutions.⁵⁵ However, trends in enrollment at the city level suggest that Boston may be more resilient than the state overall.

Boston Enrollment

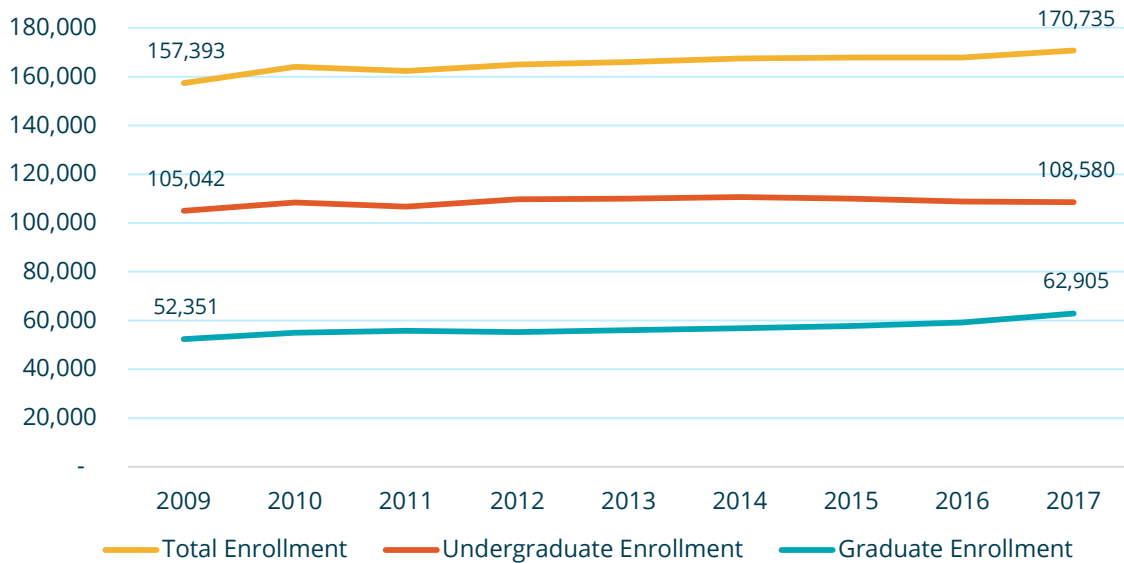
Boston has so far maintained steady growth in overall enrollment. Total college and university enrollment in Boston rose by 13,340 (eight percent) between 2009 and 2017, with undergraduate enrollment increasing by 3,538 (three percent) and graduate enrollment increasing by 10,554 (twenty percent). More recently, however, gains in enrollment have been driven entirely by graduate students, with graduate enrollment increasing by 6,000 students and undergraduate enrollment falling by 2,000 between 2014 and 2017. Graduate enrollment comprised 37 percent of total enrollment in 2017, up from 33 percent in 2009.

Factors Affecting Future Enrollment

Future enrollment trends depend upon several factors, including birth rates, national and international migration, and high school graduation trends. Universities may be impacted differently depending on the pool of students that they draw from and their institutional reputation. For example, in 2016, less than a quarter of the incoming freshmen at Boston University, Emerson, Northeastern, and Boston College were from Massachusetts, leaving them less susceptible to local population trends.⁵⁶ In contrast, state demographic trends will strongly impact University of Massachusetts at Boston, where 83 percent of incoming freshmen are from Massachusetts.⁵⁷

FIGURE 21

Graduate and Undergraduate Enrollment in Boston



Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), BPDA Research Division Analysis.

Declining Birth Rate

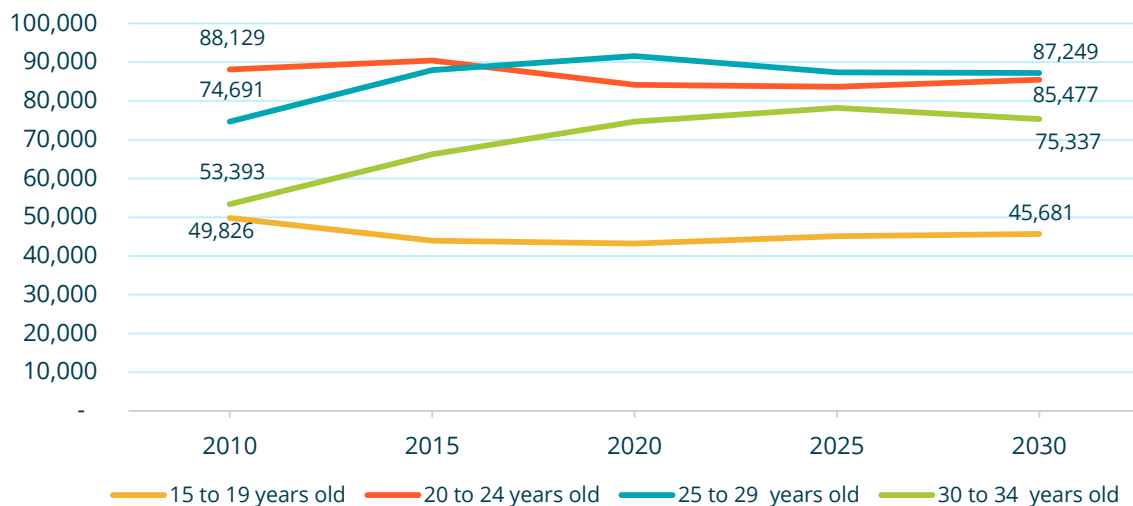
Falling birth rates across the United States pose a threat to higher education institutions, limiting their future pool of applicants. Births in the United States have been decreasing since the Great Recession, with 2017 seeing the fewest births since 1995 at 3.8 million.⁵⁹ The undergraduate classes matriculating in 2036 to 2039 will draw from two percent fewer babies born in the U.S. than the entering undergraduate classes of 2021 to 2024. The fall in births has been especially pronounced in Massachusetts and the rest of New England. Births from 2014 to 2017 in Massachusetts were 12 percent lower than from 1999 to 2002. Overall the number of births in New England declined 13 percent over this time period.

Population Projections for Young Adults

The impact of birth rates on the young adult population differs at the national and the local level. When accounting for both domestic birthrates and international migration, the U.S. Census Bureau projects that the 20 to 24 year old population will increase by three percent nationally from 2010 to 2030. However, the BPDA population projection for the city of Boston (which also accounts for both national and municipal birthrates and trends in domestic and international migration) expects that the 20 to 24 year-old population in Boston will decline by three percent from 88,129 in 2010 to 85,477 in 2030. In contrast, the 30 to 34 year-old population is expected to increase from 53,393 to 75,377 over the same period, a 41 percent increase, potentially contributing to a pool of older students who may enroll in graduate education.

FIGURE 22

Population Projections for Young Adults in Boston



Note: Trend from 2000 to 2006 is interpolated.

Source: U.S. Census Bureau, 2010 Census, BPDA Research Division Population Projection Model.

Share of Young Adults Enrolled in School

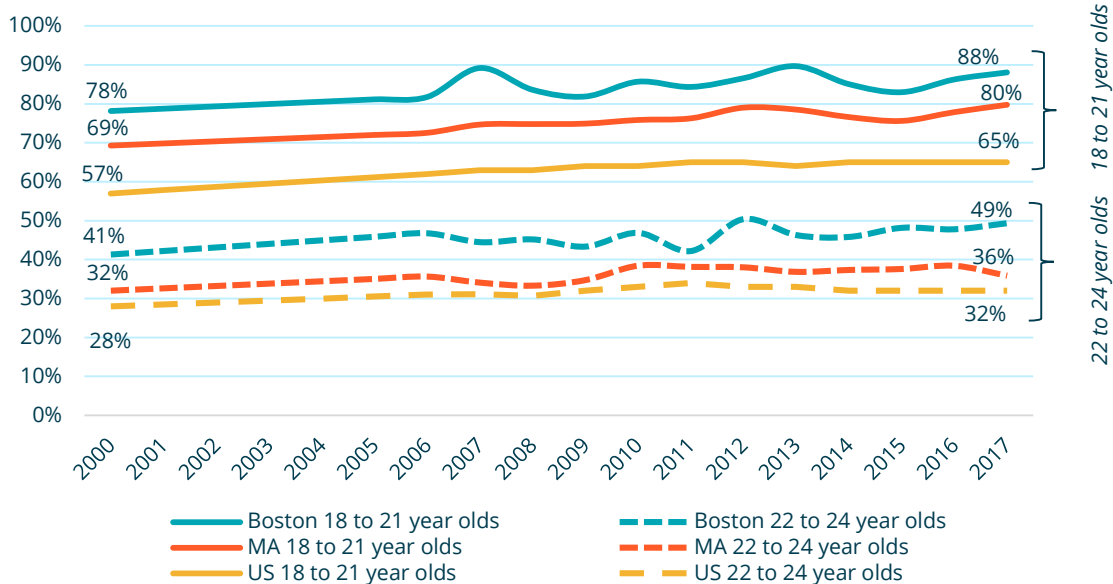
Though the total population of young adults in Boston may decline in the future, this may be counteracted by an increase in the share of college-age individuals choosing to enroll in college. Boston continues to have higher rates of college enrollment than either Massachusetts or the United States, though enrollment rates at all levels have increased. The share of 18 to 21 year olds in Boston enrolled in school has risen from 78 percent in 2000 to 88 percent in 2017, while the percent of 22 to 24 year olds enrolled in school has increased from 41 percent to 49 percent over the same period.

Rising high school graduation rates may further mitigate the effect of declining birth rates on col

lege enrollment. Nationally, the four-year high school graduation rate rose from 79 percent in 2011 to 85 percent in 2017,⁶⁰ while in Massachusetts it grew from 80 percent in 2006 to 88 percent in 2018.⁶¹ Boston Public Schools see lower graduation rates than the state, but have improved drastically from 59 percent in 2006 to 75 percent in 2018.⁶² An increase in the share of high school graduates deciding to pursue higher education may also bolster college enrollment rates into the future. Nationally, 70 percent of high school graduates enrolled in college after graduation in 2016, up from 62 percent in 1995.⁶³ In Massachusetts, 83 percent of high school graduates enrolled in college in 2012, up from 74 percent in 1995.⁶⁴

FIGURE 23

Share of Young Adults Enrolled in School in Boston, Massachusetts, and U.S.



Note: Trend from 2000 to 2006 is interpolated.

Source: U.S. Census Bureau, 2000 Census & ACS 1-year estimates 2006 to 2017, PUMS, BPDA Research Division Analysis.

International Students

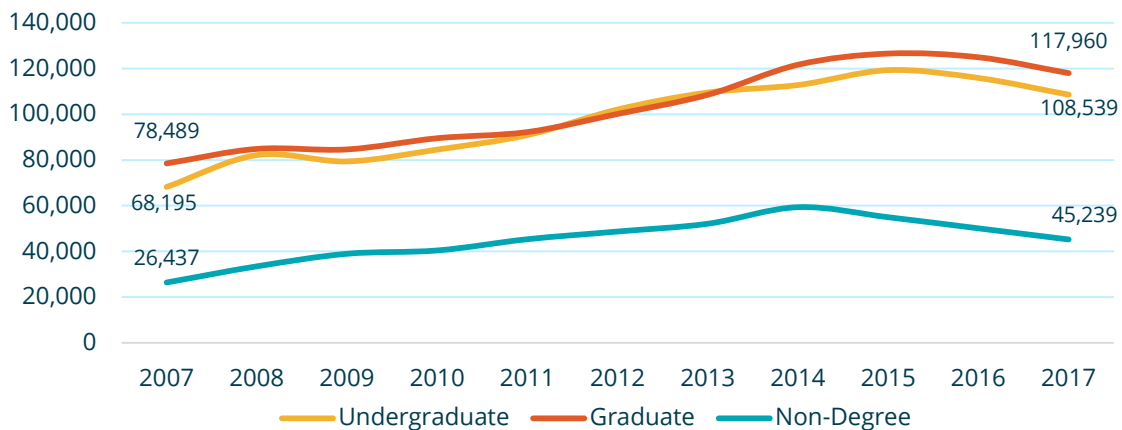
Colleges may attempt to increase recruitment of international students to fill in the gaps left by the declining domestic young adult population. International students currently make up 5.5 percent of total U.S. enrollment (4.5 percent when excluding students completing Optional Practical Training⁶⁵), the highest share they have ever reached. However, after growing 71 percent between 2005 and 2016, the number of international students studying in the United States declined 1.3 percent between 2016 and 2017.⁶⁶ New enrollments in particular have fallen by nine percent for undergraduates and seven percent for graduate students since 2015. A survey of over 1,000 institutions by the Institute of International Education identified the top three reasons for declines in enrollment: concerns over the visa application process and/or visa delays and denials; the social and political environment in the United States;

and preferences for educational opportunities in countries other than the U.S.⁶⁷

Even in the face of changing attitudes among international students and uncertain immigration policies in the United States, Massachusetts is likely to remain one of the most popular destinations for international enrollment. The state currently ranks fourth in the nation in number of international students and saw enrollment rise by 8.4 percent from 2017 to 2018.⁶⁸ Boston University and Northeastern already draw heavily upon international students, with approximately 25 percent of Boston University's freshman class and 18 percent of Northeastern University's freshman class coming from abroad in 2016.⁶⁹ Northeastern ranks third in the nation among all institutions in number of international students while Boston University ranks tenth.⁷⁰

FIGURE 24

New International Student Enrollment in U.S.



Source: Institute of International Education, "International Student Enrollment Trends, 1948-2017," and Open Doors Report on International Educational Exchange.

Older Students

Enrollment may also be influenced by the decisions of students older than the typical college-aged population. Currently in Massachusetts, 23 percent of undergraduates and 79 percent of graduate students are 25 or older.⁷¹ Given that graduate enrollment is on the rise in Boston and that high-skill jobs increasingly require advanced degrees, Boston area institutions may attempt to attract more students in their later twenties and early thirties in the future.

Enrollment Projections for Boston Institutions

The impact of shifting student demographics on Boston colleges and universities will differ depending upon the institutions' target student populations. The following section provides preliminary projections around enrollment for three categories of colleges and universities:

Two-Year Colleges

Two-year colleges such as Bunker Hill and Roxbury Community Colleges draw heavily from local residents. Approximately 23 percent of Massachusetts high school graduates in 2012 enrolled in a two-year college, up from 18 percent in 1995.⁷² If current high school graduation and community college enrollment rates in Massachusetts persist, declining birth rates could lead to about an eight percent decline from 2020 to 2035 in community college enrollment. However, if graduation and enrollment rates continue their upward trend, community colleges could see an increase in enrollment as an accessible gateway to higher education or as a pathway for older students to return to school for additional training.

Four-Year Public Colleges and Regional Private Colleges

Public colleges such as UMass Boston and Massachusetts College of Art and Design draw most of their students from Massachusetts residents. Approximately 28 percent of Massachusetts high school graduates in 2012 enrolled in a four-year public college, up from 23 percent in 1995.⁷³ Boston also has a number of regional private colleges such as Emmanuel College, Wentworth Institute of Technology, and Simmons University (formerly Simmons College) that draw most of their students from Massachusetts or other New England states.⁷⁴ The share of Massachusetts high school graduates enrolling in a private four-year college was flat from 1995 to 2012 at just under 30 percent.⁷⁵ These colleges may be the hardest hit by the declining birth rates in the region. Depending on the increases in graduation and enrollment rates, they may face a 10 to 15 percent decline in their pool of domestic applicants. If public funding remains available to support enrollment, UMass schools may be better able to compete for students due to their lower cost.

National Universities

Several Boston colleges and universities are national, if not global, institutions. Boston University enrolls a higher share of students from other countries than it does from New England. The declining birth rates in Massachusetts will not impact these institutions significantly. Institutions such as Boston University, Boston College, and Northeastern should continue to be able to compete nationally and internationally to recruit and retain students.

Looking Ahead: Higher Education in Boston

Efforts to Increase Revenue

Though demographic shifts remain beyond the control of the higher education industry, colleges and institutions are pursuing creative strategies to increase revenue. Below are examples of how local institutions have leveraged existing assets and adapted to the changing demands of the college-going population.

Leveraging Real Estate

Colleges and universities own a significant quantity of valuable real estate in Boston, property that can be leveraged to bring in additional revenue through partnerships with the private sector. In 1999, Emmanuel leased land to Merck and Brigham and Women's to develop medical research facilities, which added research capacity to the college and grew the endowment from seven million dollars to \$136.6 million in 2019.⁷⁶ UMass Boston announced in February 2019 that it would lease its 20-acre Bayside Expo site, which the university purchased out of foreclosure for \$18.7 million in 2010, to private developer Accordia Partners.⁷⁷ The 99-year ground lease will bring in \$235 million which will help to repair the university's underground garage and may fund new buildings for the nursing school and computer science programs. UMass Boston and Northeastern have also partnered with private real estate developers to build student housing, outsourcing

the costs of managing dorms to the private sector. Boston's in-demand real estate market offers an opportunity for institutional land holders to increase revenue to fund on-campus operations and infrastructure projects.

Mergers and Acquisitions

Some small colleges have merged with larger, financially-stable institutions to keep their doors open. For example, Wheelock College proactively sought a merger with Boston University in 2018 in response to anticipated financial challenges, eventually forming the Wheelock College of Education & Human Development within BU's School of Education.⁷⁸ BU acquired about half of Wheelock's staff as well \$70 million worth of real estate in the deal. Berklee College of Music merged with the Boston Conservatory in 2016, combining Berklee's strengths in technology, business, and sound production with the Boston Conservatory's focus on classical training.⁷⁹ Also in 2016, Tufts University formally acquired the School of the Museum of Fine Arts after a decades-long partnership, allowing for the continuation of the schools' dual-degree program while addressing the SMFA's enrollment challenges.⁸⁰ Mergers and acquisitions allow smaller universities to access larger budgets for student recruitment and programming, while larger universities benefit from expanding the diversity of their faculties and curricula.

Online Education

The emergence of online education, originally predicted to drastically disrupt the standard educational model, may in fact aid the on-campus instruction occurring at local colleges and universities.

The number of students enrolled exclusively in online learning in Boston’s higher education institutions increased by 4,440 between 2012 and 2017, accounting for nine percent of total enrollment in 2017 compared to seven percent in 2012.

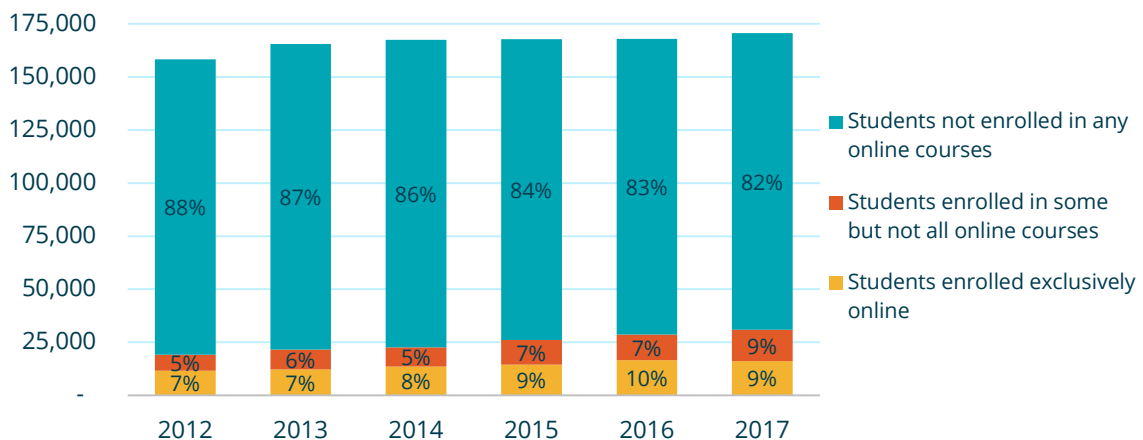
⁸¹ Additionally, the number of students taking some but not all of their classes online increased by 7,230 and now accounts for nine percent of total enrollment, compared to five percent in 2012. 83 percent of students exclusively enrolled in online classes are graduate students, and 27 percent of the increase in graduate student enrollment between 2012 and 2017 can be attributed to students who take all of their classes online.

Simmons University offers an example of how struggling small colleges may turn to online education as a way to improve finances. To help defray costs of the undergraduate program, in 2014 Simmons University expanded its online master’s programs offerings. While the undergraduate division broke even in 2014, the online graduate programs brought in \$5.4 million, then \$56 million in 2017.⁸² The university’s total annual revenue nearly doubled between 2014 and 2017.

Other colleges may choose to go a similar route to deal with declining enrollment and declining profitability at the undergraduate level. For example, the University of Massachusetts has announced its intention to open a national online college.⁸³ Among Boston institutions, only six did not have any students enrolled in online courses in 2017, while five had over 70 percent of their students enrolled in at least some online courses.

FIGURE 25

Online Education Enrollment at Colleges and Universities in Boston



Source: National Center for Education Statistics, IPEDS, BPDA Research Division Analysis.

Summary

Demographic shifts may reduce the supply of college students, increasing competition between colleges that may put fiscal pressure on smaller colleges with fewer resources. However, recruitment of students from outside the New England region and even from outside the United States will mitigate these demographic pressures, as will an increasing share of young adults attending college and graduate school to prepare for the demands of the workforce. Small colleges have the option to merge with larger institutions, increase online and other non-traditional enrollment, or leverage their valuable Boston real estate to manage the fiscal pressures. Larger Boston universities can rely on their economies of scale in operations, vast student recruitment networks, large endowments, and research funding. Overall decline in Boston college enrollment approaching

2025 to 2030 may be in the order of three percent. The larger Boston economy should not be greatly affected since higher education makes up only seven percent of Boston's jobs and Boston's colleges do not pay property taxes. Colleges in Boston graduate far more students each year than local employers can hire, and Boston employers successfully recruit highly skilled workers from around the region, country, and world therefore, a small dip in the number of graduates from Boston's colleges should not create a significant labor shortage.

While revenue challenges may indeed threaten smaller colleges throughout Massachusetts and New England, Boston's reputation as an educational hub will likely allow the city to successfully withstand future challenges.



Source: Harvard Business School, Allston, Alex MacLean/ Landslides Aerial Photography, 2014.

National and Local Economy Forecast

Global Economy

The International Monetary Fund is forecasting global growth to slow to 3.3 percent in 2019, compared to 3.6 in 2018, and 4.0 percent 2017 with an estimated growth rate of 4.0 percent.⁸⁴ The forecasted global growth rate is down in part due to the uncertainties and negative effects of the new U.S. tariffs and trade tensions with China, the United Kingdom's pending exit from the European Union, stricter credit regulation in China and tight financial conditions in major economies. In January 2019, global growth was projected to be slower than 3.3 percent, however the tempering of U.S. China trade deal, minimal inflationary pressures, and the U.S. Federal Reserve's accommodative monetary policy improved the growth forecast. Though, the lingering uncertainties depress the projected growth in comparison to previous years.

U.S. Economy

Growth in the U.S. economy is also forecasted to slow. In 2018, the United States GDP grew by 3.1 percent, and the GDP is expected to grow by 2.1 percent in 2019, followed by 1.9 percent in 2020.⁸⁵ In 2018, the U.S. economy received a fiscal stimulus through tax cuts and increased government spending, and the robust GDP growth can be attributed to the effects of these stimuli. The Tax Cuts and Jobs Act of 2017 permanently lowered the corporate income tax rate and temporarily reduced the individual income tax rate through 2025, overall raising the spending power of businesses and households. The Bipartisan Budget Act of 2018 increased the caps on federal discre-

tionary spending, which increased aggregate demand and the budget deficit. In 2018, the fiscal stimulus contributed to the spike in GDP growth, however the effects of this stimulus are likely to wane in 2019 and the coming years as the economy settles back to a sustainable level of output. The Congressional Budget Office (CBO) anticipates that business investment will slow and federal purchases will decrease. New tariffs will drag down the GDP growth rate going forward. The CBO estimates that new tariffs on imports and U.S. exports will reduce real GDP by an average of 0.1 percent each year into 2029.⁸⁶ By 2020 the economy is projected to settle into a rate of 1.9 percent annual growth.⁸⁷

The unemployment rate has remained low; in the final quarter of 2018, national unemployment was at 3.8 percent and it is projected to fall to 3.6 percent in 2019.⁸⁸ The Federal Reserve projects that in 2020 the unemployment rate will begin to rise, which in the long run will bring the unemployment rate back to the natural level of 4.5 to 5 percent. According to the Federal Reserve, wage growth is increasing at a modest rate, and now more employers are including more non-wage benefits like healthcare, profit sharing, bonuses and paid vacation days to attract new workers.

Economic conditions in 2018 were characterized by low unemployment, robust consumer demand for goods and services and strong business investment. In 2018, the Federal Reserve raised the federal funds interest rate four times to mitigate in-

flationary pressures. Despite low unemployment and high spending, inflation has stayed below the Federal Reserve's target of 2.0 percent. However, the Federal Reserve anticipates that spending and investment will weaken in 2019, which signals that economic growth may be slowing. The sign of slowing growth prompted the Federal Reserve Open Market Committee to announce in July 2019 that it would decrease the target for the Federal Funds rate by 0.25 percentage points, to a range of 2.0 to 2.25 percent.⁸⁹

Local Economy

Strong national economic growth is reflected at the state level for Massachusetts and for the City of Boston. In 2018, Massachusetts GDP had an average growth rate of 3.2 percent, which was on par with the national rate of 3.1 percent.⁹⁰ Massachusetts GDP grew by 4.6 percent in the first quarter of 2019, while the U.S. GDP grew by only 3.2 percent.⁹¹ It is anticipated that GDP growth in the Commonwealth will be modest in the later quarters of 2019, in comparison to previous years. MassBenchmarks estimates that Massachusetts GDP will have a growth rate of 3.2 percent in the second quarter and 2.6 percent in the third quarter of 2019.

Massachusetts had another strong year for job growth, adding 63,000 jobs from September 2017 to September 2018. While the growth rate is slower than previous years it is anticipated that job growth will continue and that Boston will lead the job growth for the Commonwealth.⁹² In the first quarter of 2019, Massachusetts payroll employment grew at a rate of 2.3 percent, as compared to the U.S. rate of 1.7 percent.⁹³ In 2018, the Massachusetts unemployment rate remained low at 3.6 percent, which was on par with the national unemployment rate at 3.8 percent. Due to the

low unemployment rates it is likely that Massachusetts economy is approaching or has reached full employment. The unemployment rate for April 2019 was 2.6 percent for the Commonwealth, and unemployment has not been so low so since the strong economy of the late 1990s. Economic growth in Massachusetts is strong but may be limited in the future by the availability of workers.

The few signs of weakness in the Massachusetts economy include lagging consumer spending and business confidence. In the first quarter of 2019, state regular sales and motor vehicle sales tax revenues declined 3.9 percent, contrasting the growth in the fourth quarter of 2018. The Associated Industries of Massachusetts index of business confidence is also declining, however confidence is still relatively high despite the decline. MassBenchmarks asserts that these weak spots do not indicate the end of Massachusetts' economic expansion.

Boston is experiencing a strong economy, marked by low unemployment rates, high labor demand, wage growth, and an active development pipeline. In Boston, the low unemployment rate of 3.4 percent in 2018 tightened the labor market to the extent that some industries had difficulty filling open roles, as reported by the Federal Reserve. Specifically, the restaurant sector reported that it struggled to fill open positions, noting acute labor shortages and higher labor costs due to the Employer Medical Assistance Contribution and increases to minimum wage. Accordingly, restaurant prices have increased by 2.6 percent from 2017.⁹⁴ Sustained labor shortages could negatively impact economic growth, especially if shortages become more widespread throughout other industries. Labor force growth is a concern for Boston with an aging population. However

Boston is a regional economic hub, and Boston employers have historically been able to attract recent college graduates and out-of-state workers. Sustained job growth could lead to a labor shortage in certain industries—making it harder for companies to fill open roles.

The BPDA's Employment Forecast, discussed earlier in this report, projects that Boston will add between 107,000 and 150,000 total jobs by 2026, between 1.3 percent and 1.7 percent annual job growth. Professional and technical services and

health care and social assistance are projected to add the most jobs, with construction and educational services also growing at a rapid pace. Boston's educated workforce will continue to be in demand among employers, but the region's rate of housing supply growth will continue to play a role in determining how fast the labor market can expand. If the pace of labor force growth slows the city's economic growth could be impeded.

Conclusion

Boston's economy grew steadily since 2013, and the city's growth outperformed both the United States' and the Commonwealth's growth since 2014. National GDP growth is projected to decelerate, so growth in Boston may also slow. However, Boston's recent history suggests the city is well-positioned to weather any national downturn, with an economy reliant on a highly educated workforce and lower volatility industries such as health care.

For example, Boston's unemployment rate is one of the lowest in the nation, and the number of jobs in Boston is at an all-time high, employing over 800,000 people. From 2016 to 2017 Boston added 15,942 more payroll jobs, notably in professional, scientific, and technical services and in healthcare and social assistance, and these two industries have led the surge in the city's job growth post-recession.

Wage growth is steady in the city, with the highest absolute gains received by the highest paying industries, including finance, management, and professional, scientific, and technical industries. This wage growth has struggled to keep pace with the local cost of living. Between 2010 and 2017 wages grew annually by 1.5 percent in real terms, while rents increased by 3.2 percent.

The BPDA Research Division also modeled local employment projections for the city, and the results suggest that Boston has an advantage in creating new jobs because of its highly educated workforce, though housing availability remains a limiting factor in job growth. To sustain employment growth, Boston will need to produce enough housing to accommodate the growing labor force.

The City of Boston is well aware of this challenge, addressing this very issue in the 2014 "Housing a Changing City: Boston 2030", and is taking action

to increase housing production. Mayor Martin J. Walsh increased the target for the City's housing goal to 69,000 new units of housing by 2030, up from the original goal of 53,000 units. To contribute to meeting the city's new housing goal, the BPDA board approved 11.9 million square feet of new projects in 2018, anticipated to deliver 4,219 residential units and 7.4 million square feet of commercial space upon completion. A total of 3,733 housing units were built in 2018, and there are a number of projects are currently under construction throughout the city.

Housing is also a focus at the state level, with Governor Baker filing new legislation in February 2019 supporting the Housing Choice Initiative that reforms housing development in the commonwealth and aims to create 135,000 new units of housing in Massachusetts by the year 2025. Together these plans focus on the need to add housing to the city and region to accommodate increasing population growth while lessening price pressure in the real estate market.

In recent decades, trends indicate that dense cities with a highly educated workforce have had higher levels of productivity. Greater Boston has the fourth highest share of the population holding a Bachelor's degree or higher in the 50 largest metro areas in the nation. The educated workforce is likely a result of Boston's many universities and colleges. Enrollment in Boston universities and colleges is projected to decline in the coming years—a potential result of changes in the national immigration policy, interstate migration, a shrinking young adult population, rising tuition prices, and the closure of small private colleges in the city. The enrollment dip is not expected to greatly affect Boston's economy because educational services employs a small fraction of the population and the institutions do not pay property taxes. Moreover, Boston employers will continue to attract workers from outside of the city. Despite these uncertain conditions in one of the city's key industries, Boston's economy is expected to remain resilient.



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