



BOSTON'S WORKFORCE

An Assessment Of Labor Market Outcomes And Opportunities

March 2016



CITY OF BOSTON
Martin J. Walsh, Mayor



BOSTON
REDEVELOPMENT
AUTHORITY



Mayor's Office of
**WORKFORCE
DEVELOPMENT**



Dear Friends:

It is with pleasure that I announce the release of the enclosed report *Boston's Workforce: An Assessment of Labor Market Outcomes and Opportunities*. As the report highlights, the Boston economy is doing very well. Over eight years since the Great Recession began, the City is now experiencing one of its largest development booms in history, with the labor market showing significant and sustained growth in many areas.

However, many City residents are facing difficult challenges that prevent them from taking advantage of the available economic opportunities, and employers have job openings that remain unfilled. Low incomes in an expensive housing market, and lack of diplomas, degrees, or in-demand skills are just two examples of obstacles that prevent residents from achieving their educational and career goals. Upward mobility for low wage workers, access to credit and capital to buy a home and save for the future, and post-secondary education will not only advance individuals and families, they will strengthen our workforce, making our economy more productive and our communities more resilient. We must all come together in this work.

This report is the first step in a conversation among everyone who cares about sharing opportunity more widely in our city, including private and public sector experts across all disciplines. It is the result of collaboration among planning and workforce policy staff of the City of Boston, the Mayor's Office of Workforce Development (OWD) and the Boston Redevelopment Authority (BRA). I am grateful for their hard work to create what I believe can be a powerful tool for policy makers, industry practitioners, and community partners to help all Bostonians take advantage of this nearly unprecedented period of economic growth. I hope you will join us in this collective effort.



Sincerely,

A handwritten signature in black ink that reads "Martin J. Walsh". The signature is written in a cursive, slightly slanted style.

MARTIN J. WALSH

Mayor
City of Boston

Dear Colleagues:

Making sure that all Boston residents are well-positioned to benefit from and succeed in our recovering economy is one of our City's top priorities. This report not only highlights current trends in the Boston labor market, but also identifies existing gaps and future challenges for Boston's employers and job seekers.

Too many of Boston's residents face multiple barriers to economic mobility. To address these barriers, the Mayor's Office of Workforce Development (OWD) is working to increase capacity, improve the quality and alignment among and between job training programs, and connect vocational and adult education institutions to the workforce system. It also is helping low income residents to build credit as well as financial and income assets through financial coaching and accessing resources like the Earned Income Tax Credit. As Boston is a high cost city, simple job training and placement isn't enough. Our goal is to provide longer-term, sustainable career pathways that enable Boston families to have home ownership opportunities, care for and obtain quality education for their children, save for the future and give back to their communities.

The data in this report is very useful, and it demonstrates that there needs to be a multi-pronged, coordinated approach to make sure all residents can access quality jobs and career paths, through an education and workforce training system that not only meets employer needs but helps job seekers in other areas of their lives. Mayor Walsh is committed to ensuring that all residents can access opportunities and resources critical for individual, family and community wealth building for an improved quality of life, but the City cannot do it alone. I hope that you will continue to partner with us and help make Boston's economy more inclusive.



In solidarity,

A handwritten signature in blue ink, appearing to be 'Trinh Nguyen'.

TRINH NGUYEN

Director

Office of Workforce Development

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INTRODUCTION

Boston's economy has experienced strong growth in the aftermath of the Great Recession, with rapidly expanding healthcare and technology sectors, booming construction, and a falling resident unemployment rate. Still, too many Boston residents are having trouble accessing economic opportunity. One in five Bostonians lives in poverty – close to one in three children under 18 – and a far greater share earn too little to afford the high cost of living in the city. A recent national report ranked Boston first in income inequality among America's largest 50 cities.¹ Boston's economy may be booming, but the benefits are hard to see for many residents.

A primary challenge facing residents seeking greater economic opportunity is lack of educational attainment. Among Boston residents age 25 and older, 15.3 percent have less than a high school education, and 20.5 percent hold only a high school degree or equivalent. While some growing sectors are projected to continue to have openings for workers with no additional credentials, these jobs tend to be low-paying with few benefits, unpredictable work schedules, and few established paths for advancement. Meanwhile, an increasing share of openings in the city's fastest growing sectors require at least some post-secondary or vocational certification, and Boston residents remain severely underrepresented in these occupations.

The Office of Workforce Development is committed to helping Boston residents prepare for and connect with economic opportunities that will enrich their lives and futures. Ensuring opportunity for all Bostonians means rededicating focus on helping residents navigate their entire career pathway. A focus on career pathways recognizes that labor market experience alone is not enough to move up in today's labor market. A successful workforce development system must connect workers with opportunities to acquire in-demand skills that will help them achieve their goals.

This report takes stock of the current and projected labor market conditions facing Boston residents. It focuses on three major areas:

- Assessing current labor market outcomes for Boston residents.
- Contrasting the employment outcomes of residents to those of non-residents working in the city.
- Exploring recent and projected trends in the local economy and the job opportunities available to city residents.

¹ The report, released by the Brookings Institution, ranks cities based on the ratio of household income at the 95th percentile compared to that at the 20th percentile. See Berube and Holmes "City and metropolitan inequality on the rise" (2016).

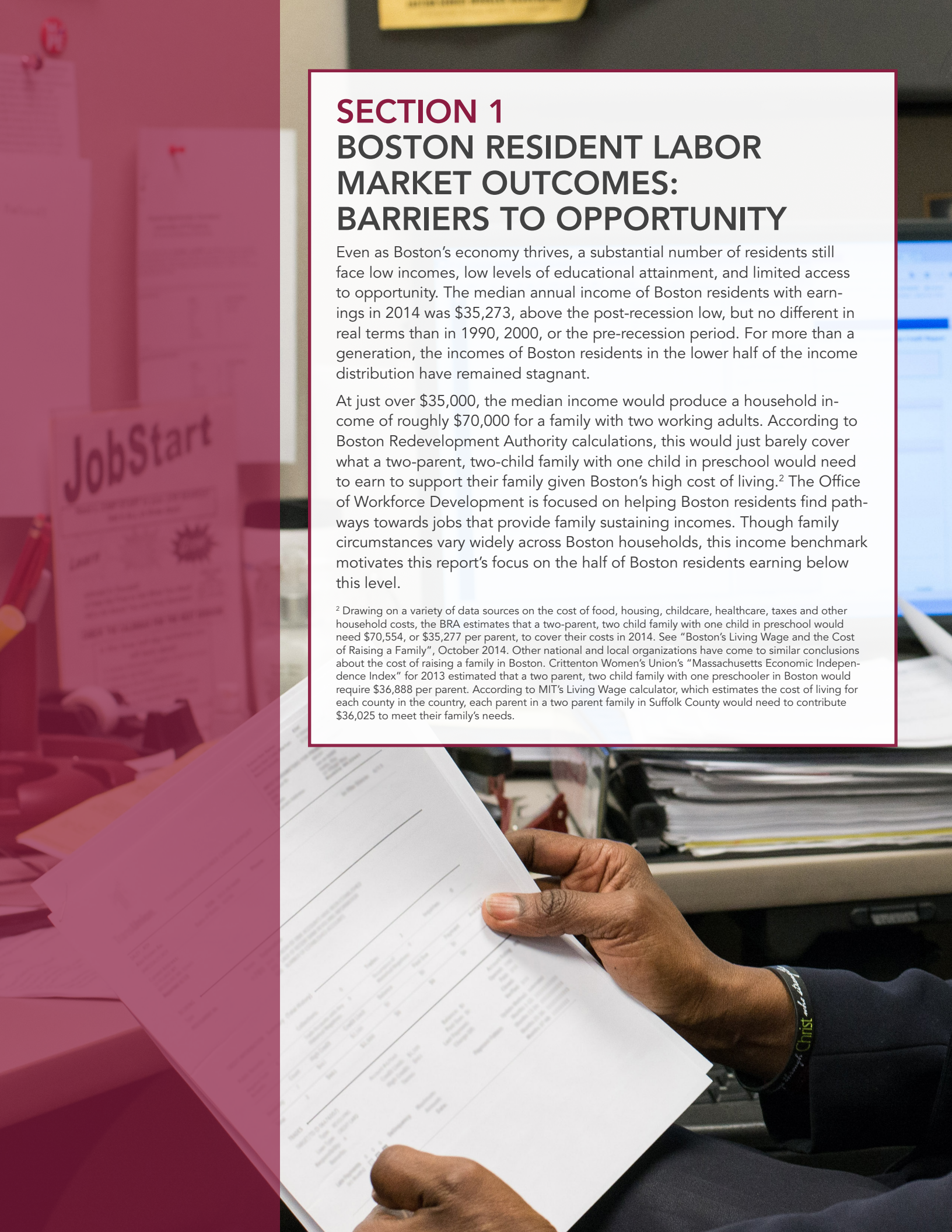
SECTION 1

BOSTON RESIDENT LABOR MARKET OUTCOMES: BARRIERS TO OPPORTUNITY

Even as Boston's economy thrives, a substantial number of residents still face low incomes, low levels of educational attainment, and limited access to opportunity. The median annual income of Boston residents with earnings in 2014 was \$35,273, above the post-recession low, but no different in real terms than in 1990, 2000, or the pre-recession period. For more than a generation, the incomes of Boston residents in the lower half of the income distribution have remained stagnant.

At just over \$35,000, the median income would produce a household income of roughly \$70,000 for a family with two working adults. According to Boston Redevelopment Authority calculations, this would just barely cover what a two-parent, two-child family with one child in preschool would need to earn to support their family given Boston's high cost of living.² The Office of Workforce Development is focused on helping Boston residents find pathways towards jobs that provide family sustaining incomes. Though family circumstances vary widely across Boston households, this income benchmark motivates this report's focus on the half of Boston residents earning below this level.

² Drawing on a variety of data sources on the cost of food, housing, childcare, healthcare, taxes and other household costs, the BRA estimates that a two-parent, two child family with one child in preschool would need \$70,554, or \$35,277 per parent, to cover their costs in 2014. See "Boston's Living Wage and the Cost of Raising a Family", October 2014. Other national and local organizations have come to similar conclusions about the cost of raising a family in Boston. Crittenton Women's Union's "Massachusetts Economic Independence Index" for 2013 estimated that a two parent, two child family with one preschooler in Boston would require \$36,888 per parent. According to MIT's Living Wage calculator, which estimates the cost of living for each county in the country, each parent in a two parent family in Suffolk County would need to contribute \$36,025 to meet their family's needs.





EARNINGS FOR ALL BOSTON LABOR FORCE PARTICIPANTS

As Figure 1 illustrates, incomes below \$35,000 result from a combination of low wages, part-time work, and periods out of work over the course of the last year. Throughout this report we limit much of our analysis to labor force participants: those who were either working or actively looking for work during the week of their interview with the Census Bureau's 2014 American Community Survey (ACS). There were 379,654 Boston residents participating in the labor force in 2014. Even among this group, 4.2 percent had no earnings in the last year, either because of long-term unemployment or recent entry or reentry into the labor market. Of those who worked in 2014, just over a quarter (25.6 percent) worked part-time, defined here as having usual work hours below 35. The part-time share jumps to over half (51.0 percent) among those who worked and made less than \$35,000. An additional 10.3 percent of the labor force worked full-time, but spent less than 50 weeks of the year employed. {FIGURE 1}

WAGES OF FULL-TIME, FULL-YEAR WORKERS

Even among workers who are employed full time, many continue to struggle. Figure 2 shows how the incomes earned by full-time, full-year earners, defined as working at least 35 hours a week for 50 or more weeks out of the year, compare to several measures of wage and income adequacy. {FIGURE 2}

The state minimum wage rose by a dollar to \$9.00 in 2015, the first increase since 2001, and it is scheduled to increase by another dollar each of the next two years, reaching \$11.00 in January of 2017. For someone working at the minimum wage for 2,080 hours a year (40 hours a week, 52 weeks a year) the increase from \$8.00 to \$11.00 means an increase in annual earnings from \$16,640 to \$22,880.

Just over five percent (5.4 percent) of full-time, full-year employees had incomes below the annualized minimum wage in 2014. This is not by itself evidence of firms paying sub-minimum wages; some in this group are making low earnings in self-employment,

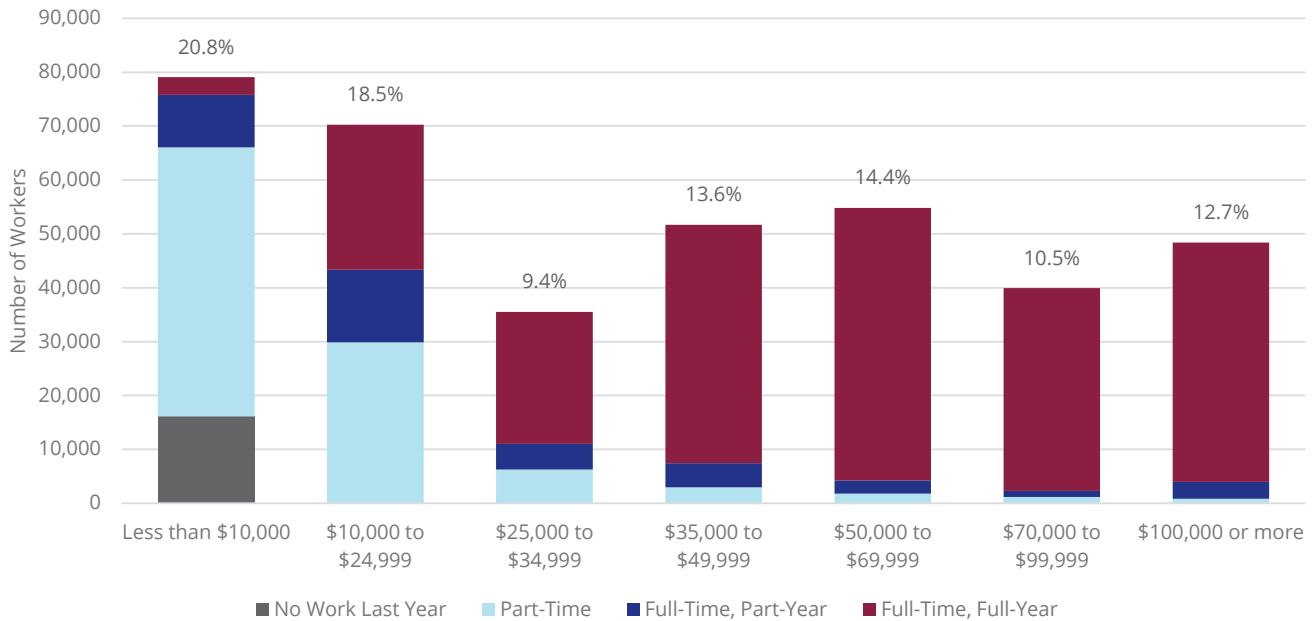
meeting our full-time, full-year threshold but working fewer than 2,080 hours, working part of the year in a state with a lower minimum wage, working in jobs not subject to the full minimum wage, or imperfectly recalling or reporting earnings, hours or weeks worked to the ACS. An additional 6.0 percent of full-time, full-year earners in 2014 had incomes above the 2014 annualized minimum wage, but below the level the minimum wage will reach by 2017.

The poverty line for a family of four was \$24,230 in 2014³, corresponding to an hourly wage of \$11.65 for an earner working 2,080 hours a year. Among full-time, full-year workers, 12.7 percent earned less than this "poverty wage". The federal poverty threshold is a national measure and does not account for the high cost of living in Boston. The City's Living Wage Ordinance attempts to address this by requiring most firms receiving city contracts or loans to pay a Living Wage, which increases annually based on changes in Federal Poverty Guidelines and the local consumer price index. The Boston Living Wage is \$14.11 as of July, 2015, up from \$13.89 in 2014. The 2014 wage works out to \$28,891 for someone working 2,080 hours a year, a level which 17 percent of full-time, full-year workers did not reach.

Even the Boston Living Wage fails to reflect the true cost of living in Boston. As referenced above, the BRA calculated that a two-parent, two-child family with one child in preschool would need each parent working full time to earn \$16.96 an hour, or \$35,277 a year, to cover all family expenses in 2014. Among full-time, full-year workers, 26.0 percent earned less than this. Boston workers live in a wide variety of family structures that differ in the number of earners present and the quantity of required expenditures; nonetheless, this family sustaining wage serves as one benchmark of how many Boston residents are struggling to find well-paying jobs. Just over a quarter of residents working full-time have jobs that pay below this standard.

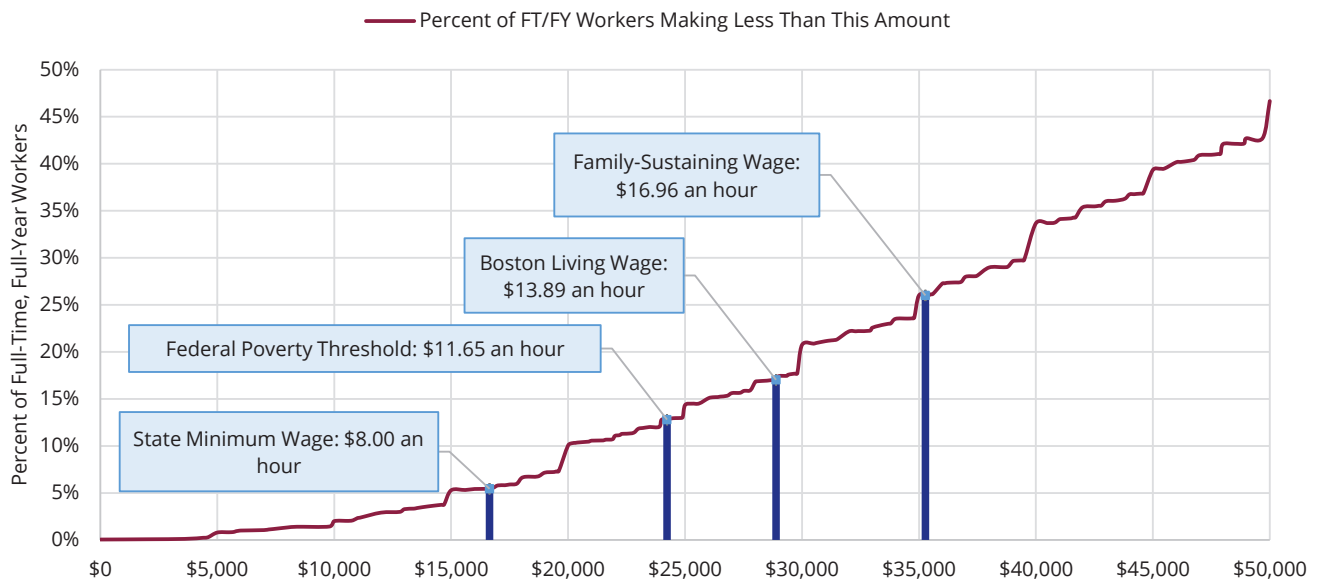
³ This is the 2014 weighted average poverty threshold for a family of four produced for the Census Bureau's Income and Poverty Report. The poverty thresholds used by the Census Bureau for official calculations vary by number of children as well as family size. The poverty thresholds are updated annually.

FIGURE 1: INCOME AMONG BOSTON RESIDENT LABOR FORCE PARTICIPANTS, 2014



Source: U.S. Census Bureau, 2014 American Community Survey Public Use Microdata Sample (PUMS), BRA Research Division Analysis
 Sample: Boston residents who were labor force participants (employed or unemployed) at the time of survey. All data are limited to the non-institutionalized civilian population, age 16 and above.
 Income includes wages, salary, and income earned from self-employment.
 *Part-time work is defined as working less than 35 hours per week. Full-time, part-year workers are defined as workers working 35 hours or more per week for less than 50 weeks over the last year.

FIGURE 2: INCOME AMONG FULL-TIME, FULL-YEAR WORKERS, 2014



Source: U.S. Census Bureau, 2014 American Community Survey PUMS, BRA Research Division Analysis
 Sample: Boston residents who were labor force participants at the time of survey and worked 35 hours or more a week for 50 or more weeks of the years. All data are limited to the non-institutionalized civilian population, age 16 and above.
 Income includes wages, salary, and income earned from self-employment.

EDUCATIONAL ATTAINMENT AND EARNINGS

The connection between low incomes and low levels of education is evident in the data. Among labor force participants not currently enrolled in school, two thirds of those with less than a high school degree make less than \$25,000, in contrast to only 15.8 percent of bachelor's degree holders. Moving from left to right in Figure 4 shows that each additional level of education brings with it significantly better earning potential. {FIGURE 4}

This presents both great possibilities and great challenges for the city's workforce development system. The intimate connection between education and income emphasizes the vital importance of connecting all Boston residents with the skills they need to move up in the labor market. At the same time, the data paint a sobering picture of the opportunities available to those whose education has stalled at the high school level. Just 30.1 percent of residents with a high school degree or less who are not currently enrolled in school make \$35,000 a year or more.

The share of Boston residents with a high school degree or less is not high by national standards: 35.8 percent of residents age 25 and older have a high school degree or less, compared to 40.8 percent nationally. Conversely, the share of residents holding a bachelor's degree or above is 43.3 percent in Boston,

over one and a half times the national average. Still, this means that over 93,000 Boston labor force participants not enrolled in school hold only a high school degree or less. {FIGURE 5}

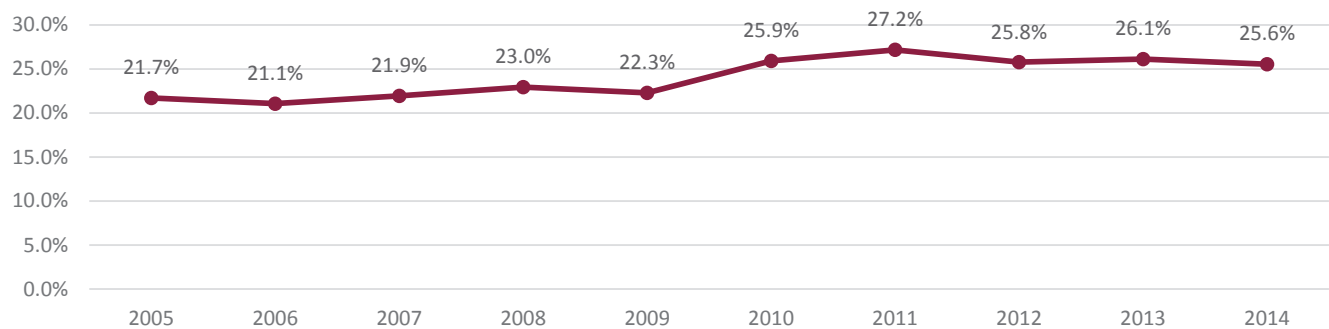
PART-TIME EMPLOYMENT

Just over a quarter of the Boston resident labor force who worked last year did so part time. Not all part-time workers desire a full-time job; for some, part time work allows for earnings while enrolled in school, attending to family obligations, or transitioning into retirement from full-time work. Enrolled students make up 41.2 percent of the part-time workforce, over twice their representation in the labor force as a whole.

For a significant number of Bostonians, however, part-time work is a consequence of forces outside their control. As seen in Figure 3, the share of part-time workers spiked in the aftermath of the Great Recession, and has remained persistently high for five years. Data from the Current Population Survey (CPS) show that the statewide share of part-time workers reporting "business conditions" or "slack work" as their reason for being part-time tripled during the recession and has remained at that elevated level.⁴ {FIGURE 3}

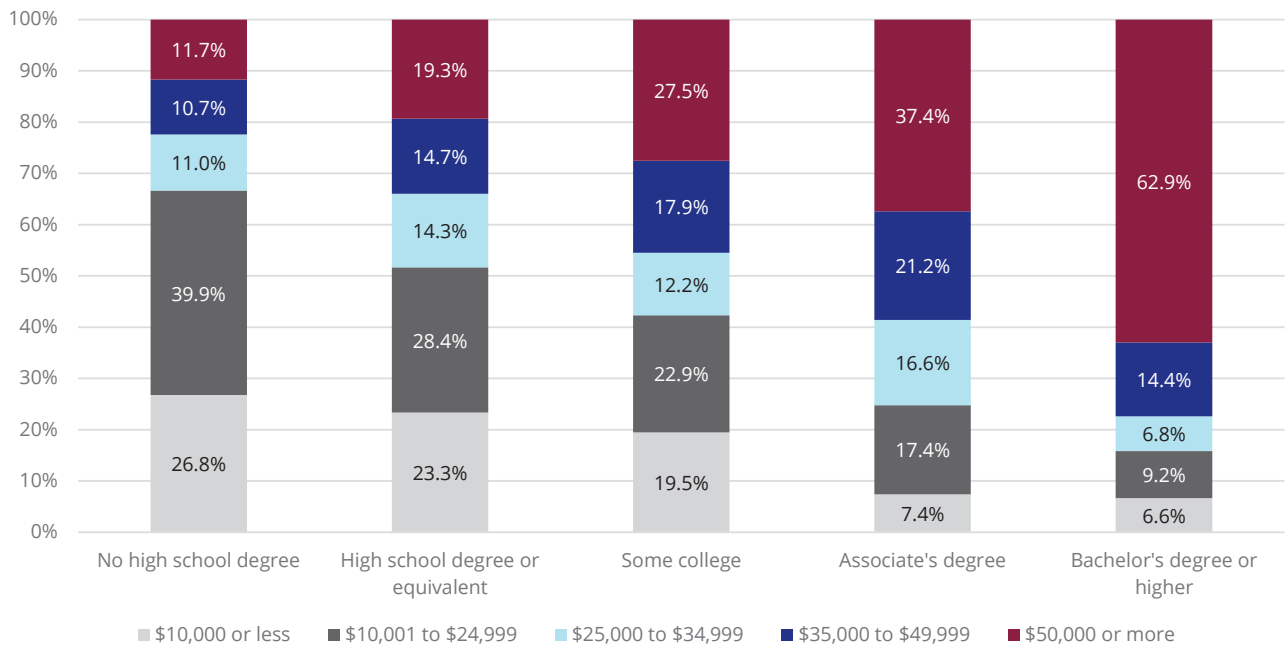
⁴ We use the statewide estimate because the CPS lacks a statistically reliable sample for city geographies.

FIGURE 3: PART-TIME WORKERS AS PERCENT OF BOSTON RESIDENT LABOR FORCE



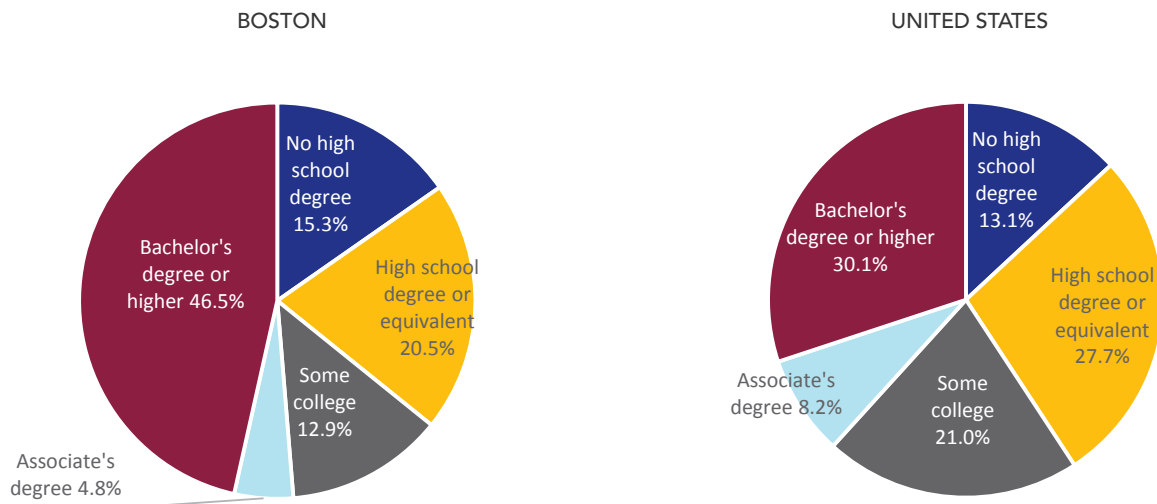
Source: U.S. Census Bureau, American Community Survey 1-year PUMS, 2005 to 2014, BRA Research Division Analysis
Sample: Boston residents who were labor force participants (employed or unemployed) at the time of survey and who worked in the last year. All data are limited to the non-institutionalized civilian population, age 16 and above.
Part-time work is defined as working less than 35 hours per week.

FIGURE 4: INCOME BY EDUCATIONAL ATTAINMENT: BOSTON RESIDENT LABOR FORCE NOT CURRENTLY ENROLLED IN SCHOOL, 2014



Source: U.S. Census Bureau, 2014 American Community Survey PUMS, BRA Research Division Analysis
 Sample: Boston residents who were labor force participants (employed or unemployed) at the time of survey and not currently enrolled in school. All data are limited to the non-institutionalized civilian population, age 16 and above.
 Income includes wages, salary, and income earned from self-employment.

FIGURE 5: EDUCATIONAL ATTAINMENT AMONG ADULTS AGE 25 AND OVER, 2014



Source: U.S. Census Bureau, 2014 American Community Survey PUMS, BRA Research Division Analysis

UNEMPLOYMENT

The Boston resident unemployment rate has remained below five percent since October of 2014, marking a return to normalcy after more than five years of elevated rates brought on by the Great Recession. Boston's unemployment rate recovered from the recession more quickly than the state and nation, and remains lower at 4.3 percent in September. Measured against the recent past, finding a job is less of a struggle for the average Boston job-seeker. {FIGURE 6}

The burden of unemployment is not shared equally across demographic groups. Among those who remain unemployed, a disproportionate number are young, Black/African-American or Hispanic/Latino, or have low levels of educational attainment. Figure 7 presents the ratio of the unemployment rate to the city average for several demographic groups. The youth unemployment rate, measured here for ages 16 to 24, is 1.62 times the city average. Black/African-American unemployment is 1.72 times higher than the city average, with Hispanic/Latino unemployment elevated at a ratio of 1.38. {FIGURE 7}

The importance of education is again evident. The unemployment rate is higher than the citywide average for all groups with less than an associate's degree, with the rate for those with less than a high school degree fully twice the overall level. By contrast, those with a bachelor's degree have an unemployment rate only 0.41 times that of the city population as a whole.

Unemployment rates also vary widely by location of residence. Map 1 shows the ratio of unemployment to the city average by census tract. Pockets of high unemployment exist in many neighborhoods across the city, with large concentrations in East Boston, Roxbury, Dorchester, and Mattapan. Some tracts have unemployment rates as high as three times the citywide average. {MAP 1}

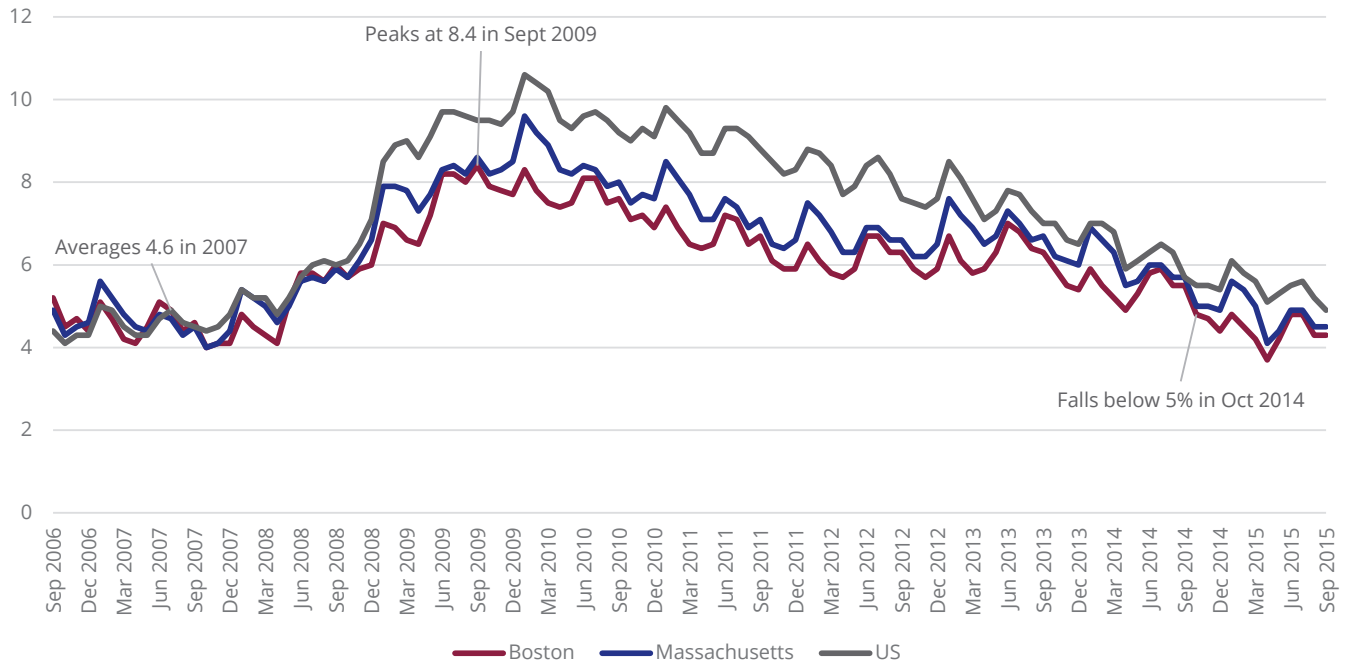
Another group that requires particular focus from the workforce development system is the long-term un-

employed. Though the overall rate of unemployment has returned to its pre-recession level, the impact of the recession is still seen in the elevated share of the unemployed who have been out of work for over a year. At the state level, where reliable samples are available in the Current Population Survey, a quarter of the unemployed report having been out of work for at least a year. Long durations of unemployment can lead to erosion in skill level, and studies have shown low willingness on the part of employers to give long term unemployed applicants a chance.⁵ As documented by Alan Krueger, former chair of the President's Council of Economic Advisors, reemployment rates among this group are less sensitive to strong local economic conditions, and there exists high risk they may exit the labor force permanently. Without substantial engagement with the workforce development system many of the long-term unemployed will be unable to find their way back into the workforce.

This group of workers who have left the labor force entirely due to frustration with unsuccessful job search are not counted when calculating the unemployment rate, which measures the share of the labor force (those working or actively seeking work) that is not employed. While this report focuses mainly on the earnings and employment outcomes of labor force participants, these "discouraged workers" are in even more urgent need of employment services. Falling labor force participation rates in the wake of the Great Recession have drawn attention nationally. The Council of Economic Advisors attributes half of the 3.1 percent fall in labor force participation rate at the national level between 2007 and 2014 to the aging population, leaving about 1.5 percent left to be explained by the severe recession or perhaps longer-term trends. While the unemployment rate has returned to pre-recession levels, the number of residents without work remains elevated.

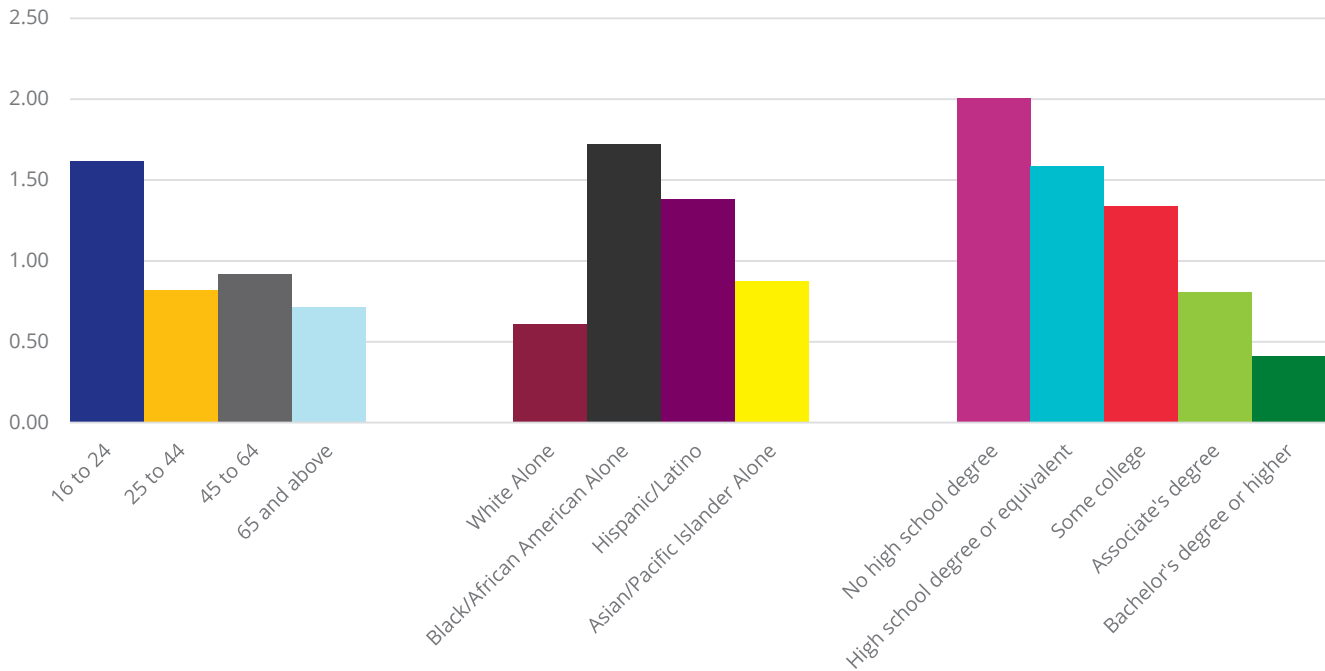
⁵ See Ghayad (2013) and Kroft, Lange, and Notowidigdo (2013).

FIGURE 6: BOSTON'S UNEMPLOYMENT RATE COMPARED TO THE STATE AND NATION, SEPTEMBER 2006 TO SEPTEMBER 2015



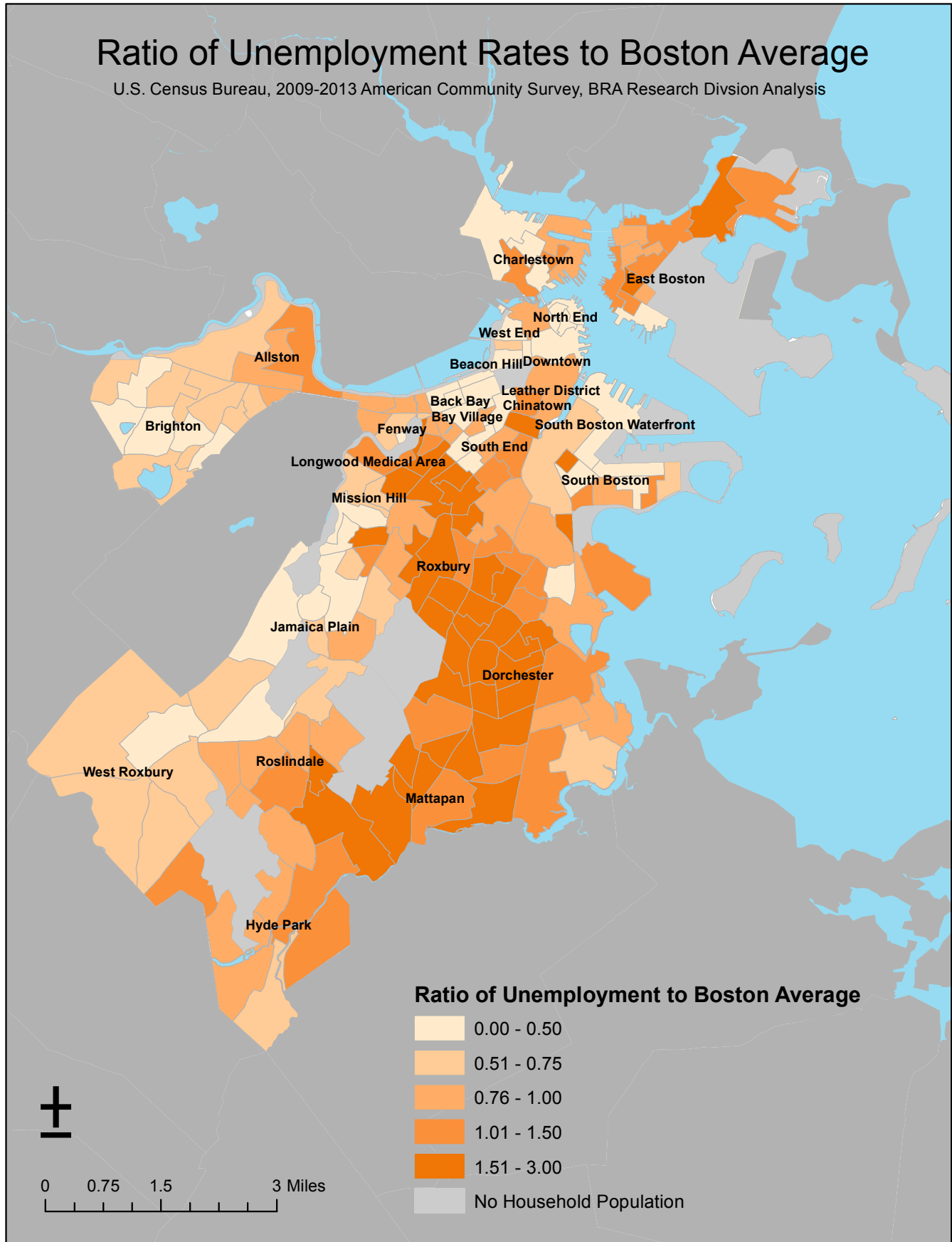
Source: Bureau of Labor Statistics, Local Area Unemployment Statistics, BRA Research Division Analysis

FIGURE 7: RATIO OF UNEMPLOYMENT RATE TO THE CITY AVERAGE

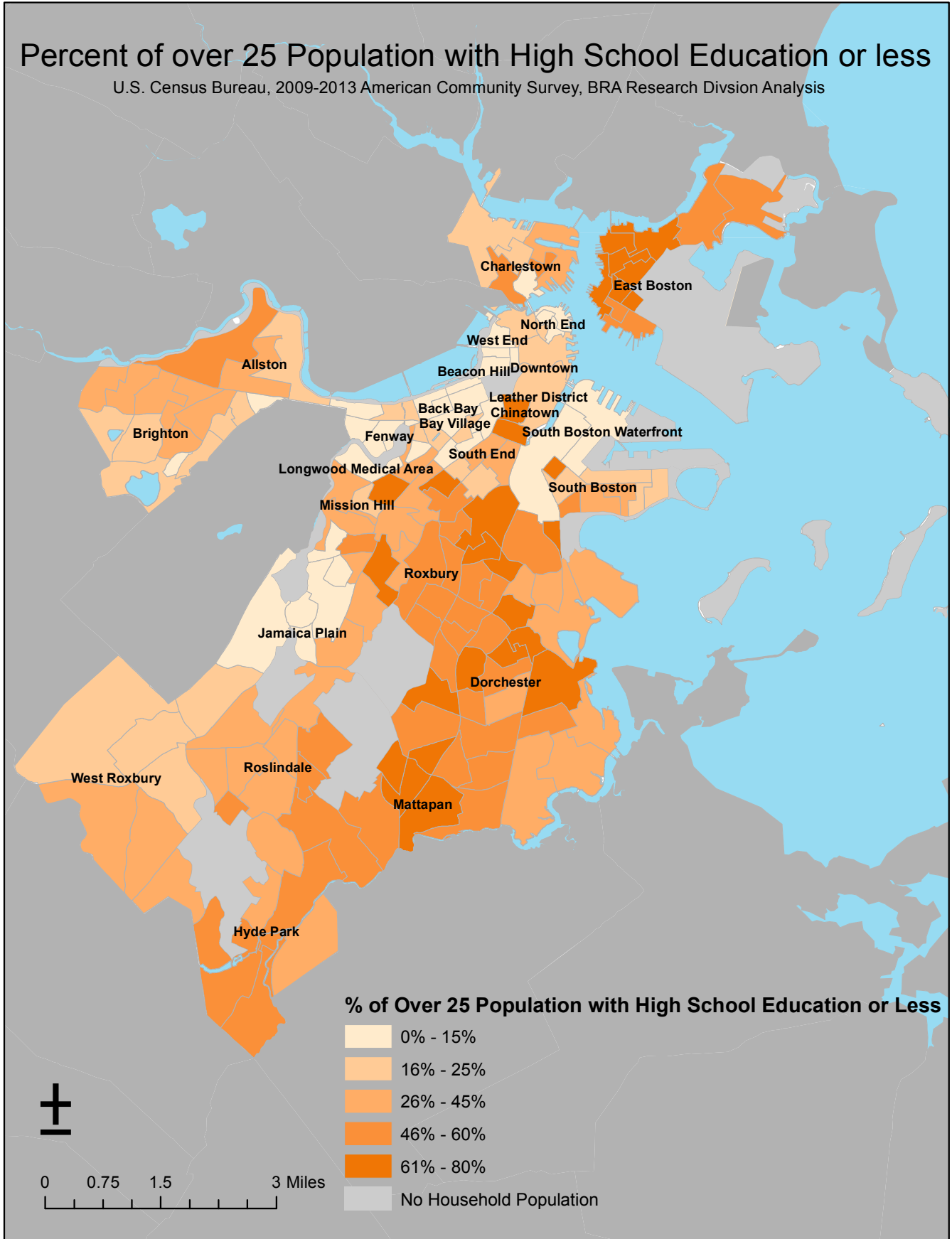


Source: U.S. Census Bureau, 2009-2013 American Community Survey, BRA Research Division Analysis.
 Note: To reduce sampling error, the most recent available 5-year ACS sample is used instead of the 2014 1-year sample.

MAP 1: UNEMPLOYMENT RATIO TO BOSTON AVERAGE BY CENSUS TRACT



MAP 2: PERCENT OF ADULT POPULATION WITH A HIGH SCHOOL DEGREE OR LESS



BOSTON'S RESIDENT LABOR FORCE AND EDUCATIONAL ATTAINMENT

Substantial earnings gaps exist by level of educational attainment. An associate's degree holder is 1.7 times more likely to make \$35,000 or more compared to someone with only a high school degree. That goes up to 2.2 times as likely for bachelor's degree holders.

Residents with low levels of education may face additional barriers to well-paying employment. Many are immigrants, some of whom face challenges related to work authorization or limited English proficiency. Like unemployment, low levels of education are concentrated spatially within the city and the challenges of living in concentrated poverty may negatively impact employment outcomes.

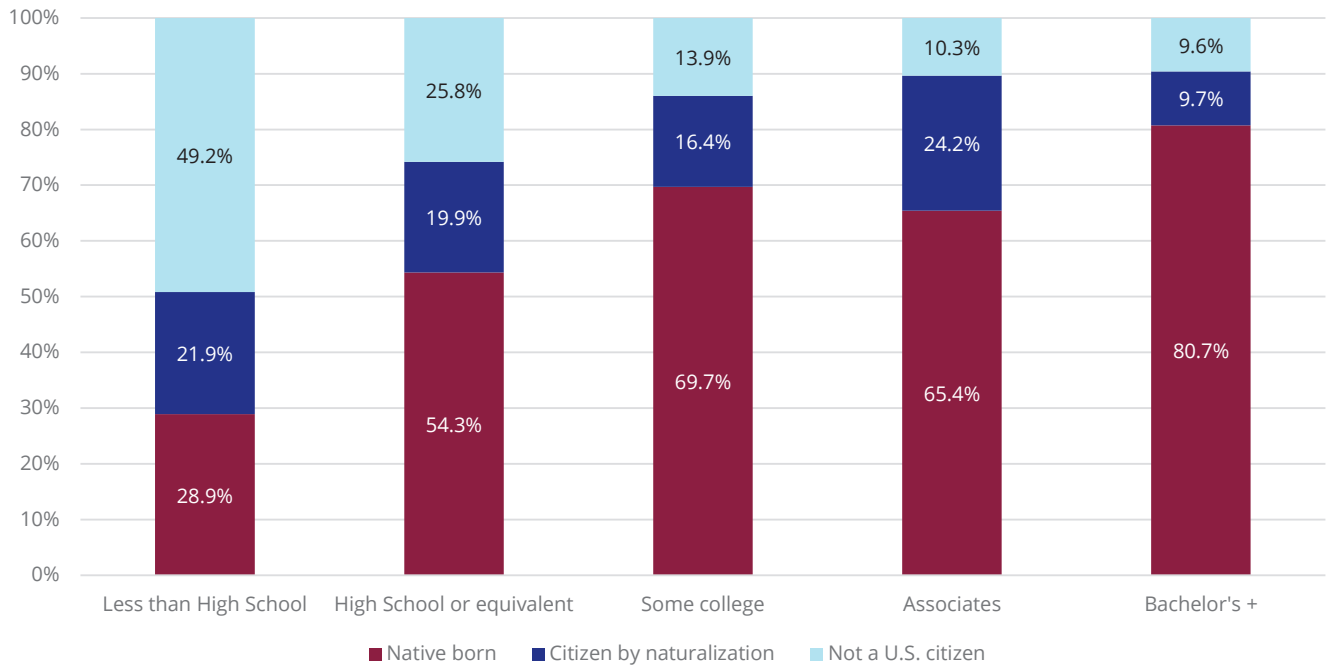
As shown in Figure 8, 71.1 percent of those with less than a high school degree are foreign born, with nearly half lacking United States citizenship. The foreign born also make up just under half (45.7 percent) of those holding only a high school degree or equivalent. A key barrier for many immigrants is limited English language proficiency, as shown in Figure 9. Among those with less than a high school degree, 63.8 percent have limited English proficiency. Even immigrants with higher levels of education who

earned their degrees abroad may have trouble using those credentials in fields with occupational licensing requirements. {FIGURES 8,9}

Residents with a high school degree or less are heavily concentrated in a handful of Boston's neighborhoods. As shown in Map 2, in some tracts in East Boston, Roxbury, Dorchester and Mattapan, those with a high school degree or less account for over 60, and in some cases as much as 80 percent of the adult population age 25 and older. Low levels of educational attainment, high unemployment rates (as shown in Map 1) and poverty cluster together, and the literature on the causes and consequences of concentrated poverty is vast.⁶ Education may represent only one of many challenges for residents in some neighborhoods. The workforce development system must play a key role in connecting residents in every neighborhood of the city to the array of services they need to confront the barriers standing between them and their employment goals. {MAP 2}

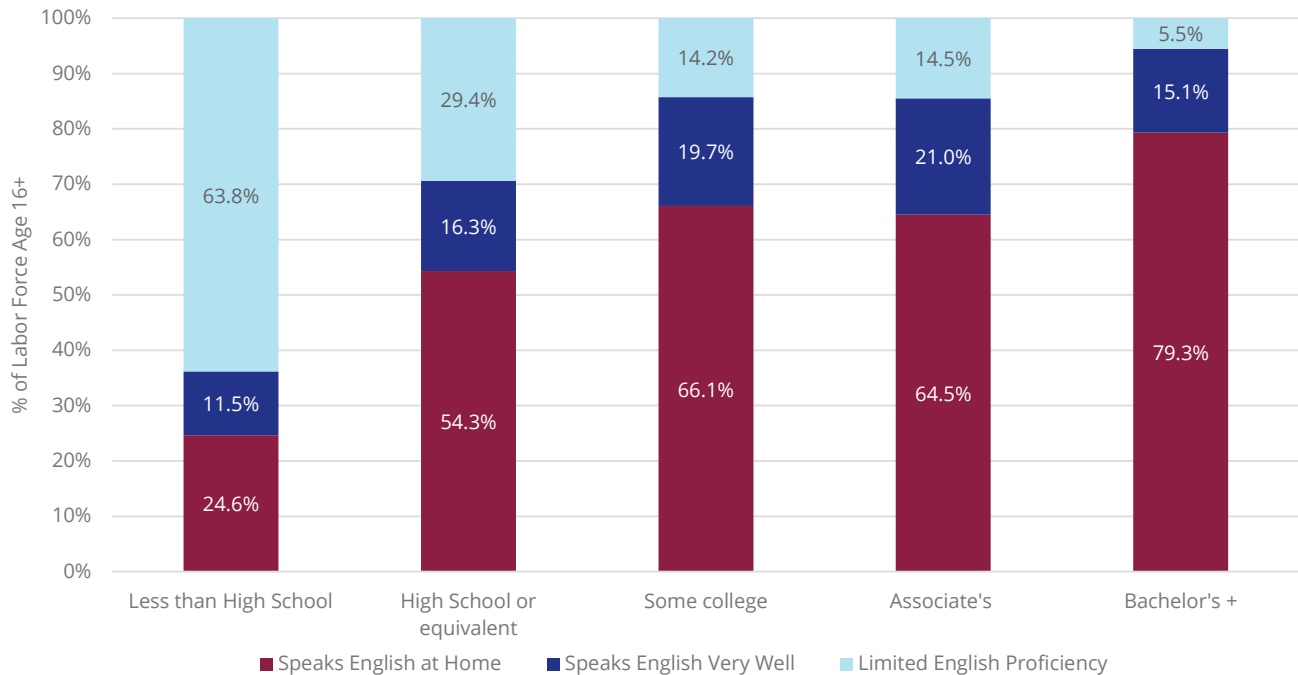
⁶ See, for instance, the pioneering work of William Julius Wilson (*The Truly Disadvantaged*, 1987, and *When Work Disappears*, 1996) and Paul Jargowsky (*Poverty and Place: Ghettos, Barrios, and the American City*, 1997) and more recent work by Patrick Sharkey (*Stuck in Place: Urban Neighborhoods and the End of Progress Towards Racial Equality*, 2013).

FIGURE 8: NATIVITY BY EDUCATIONAL ATTAINMENT, BOSTON RESIDENT LABOR FORCE



Source: U.S. Census Bureau, 2009-2013 American Community Survey, BRA Research Division Analysis
 Sample: Boston resident civilian labor force participants, ages 16+, not currently enrolled in school

FIGURE 9: LIMITED ENGLISH PROFICIENCY BY EDUCATIONAL ATTAINMENT, BOSTON RESIDENT LABOR FORCE



Source: U.S. Census Bureau, 2009-2013 American Community Survey, BRA Research Division Analysis
 Sample: Boston resident civilian labor force participants, ages 16+, not currently enrolled in school

There remain substantial gaps in educational attainment between racial and ethnic groups. Black, Hispanic and Asian residents are all over-represented in the population with less than a high school degree. The Black/African American share reaches its highest level among associate's degree holders. Bachelor's degree holders in Boston are still overwhelmingly non-Hispanic White. {FIGURE 10}

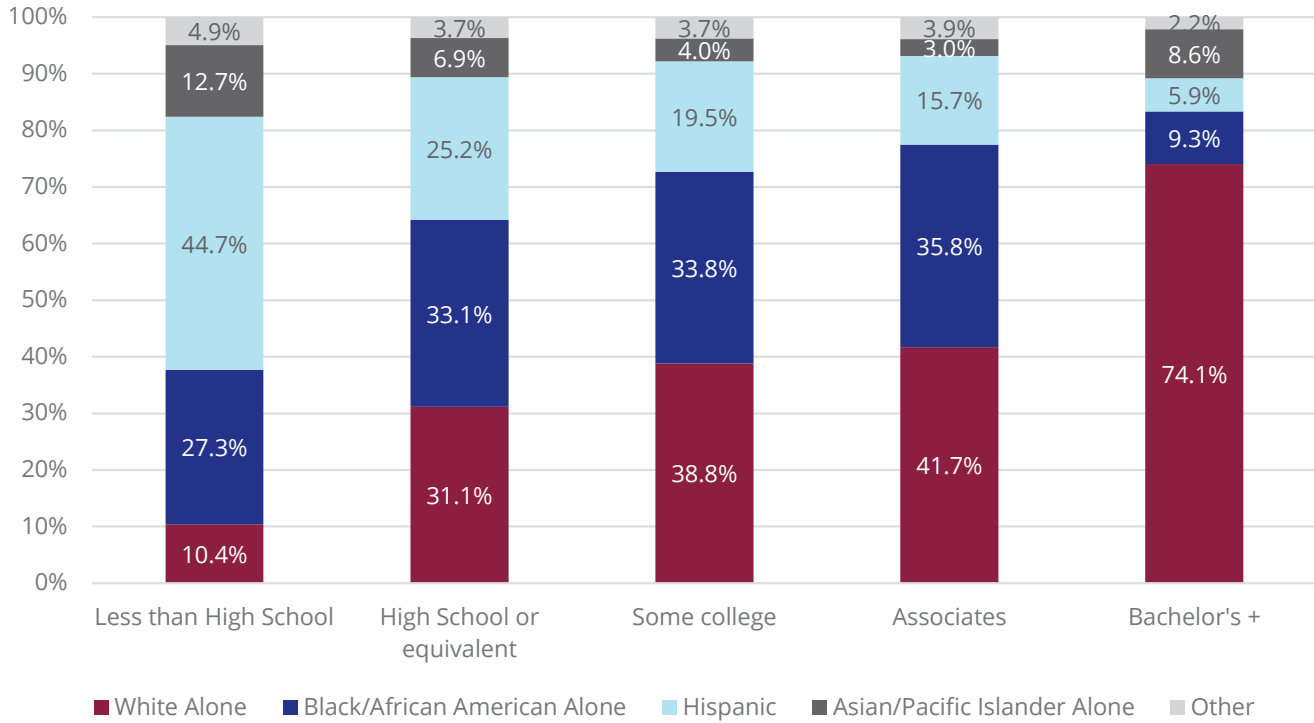
Racial earnings gaps persist nationwide, and Boston is no exception. Among labor force participants not enrolled in school, the median annual income of Non-Hispanic Whites in Boston, at \$51,000, is substantially higher than the median for Black (\$29,000), Hispanic (\$21,300) or Asian (\$36,000) residents. Scholars attribute these gaps to a variety of factors: continuing racial and ethnic discrimination in the job market; the lower average levels of education attainment among minority groups; the enduring impact of growing up in economically and racially segregated schools and neighborhoods; a spatial mismatch between job opportunities and heavily minority neighborhoods, compounded by limited transportation access; and social networks with fewer connections to good job opportunities.⁷

⁷ See Fryer (2011) and Altonji and Blank (1999) for surveys of the extensive economic literature on racial earnings gaps. Harvard sociologist Devah Pager (Pager, Western, and Bonikowski, 2009; Fryer, Pager and Spenkuch, 2013) has powerfully highlighted the enduring influence of racial discrimination on employment and earnings. See also the literature on racial segregation and concentrated poverty referenced above.

Figure 11 illustrates the size of racial earnings gaps by level of educational attainment. At each level, the earnings of Black, Hispanic and Asian residents lag significantly behind Non-Hispanic Whites. In some cases White earnings exceed those of another racial group with substantially more education, as is the case when comparing Hispanic associate's degree holders with White high school graduates. Boston is still a long way from racial equality in earnings. {FIGURE 11}

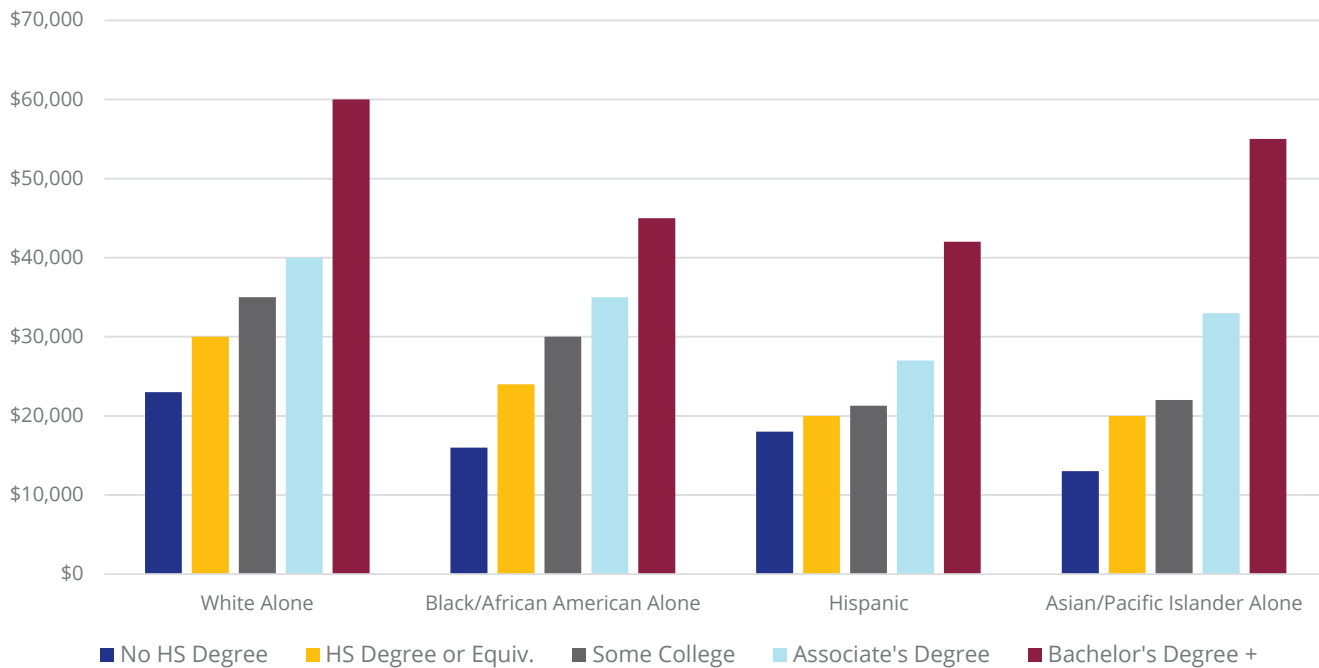
The figure also shows that within each racial group, there is a substantial return to moving up every rung of the education ladder. Connecting residents from disadvantaged groups with opportunities to continue their education and build in-demand skills is likely to have substantial impacts on earnings, even as overall racial earnings gaps persist. While education and workforce development alone may not be enough to achieve the goal of fully closing racial/ethnic earnings gaps, they remain essential in the push towards increased equity.

FIGURE 10: RACE/ETHNICITY BY EDUCATIONAL ATTAINMENT: BOSTON RESIDENT LABOR FORCE



Source: U.S. Census Bureau, 2009-2013 American Community Survey, BRA Research Division Analysis
 Sample: Boston resident civilian labor force participants, ages 16+, not currently enrolled in school
 "Other" includes Native Americans, 2 or more races, and self-reported other.

FIGURE 11: MEDIAN EARNINGS BY EDUCATION AND RACE AND ETHNICITY



Source: U.S. Census Bureau, 2009-2013 American Community Survey, BRA Research Division Analysis

SECTION 2

JOBS IN BOSTON: THE DISADVANTAGED POSITION OF RESIDENTS

As the economic hub of the New England region, Boston is home to close to 700,000 jobs, representing 16.2 percent of total statewide employment. A majority – 62 percent -- of the people who work in Boston live outside the city and commute in. The reach of Boston's labor market extends across Eastern Massachusetts into the neighboring states of New Hampshire and Rhode Island, with inner ring suburbs of Quincy, Cambridge, Brookline, Somerville and Newton each accounting for at least 2 percent of the Boston workforce. {MAP 3}





BOSTON RESIDENTS UNDERREPRESENTED IN HIGHEST PAYING INDUSTRIES

Boston's economy is home to a diverse set of industries, with particular concentrations in health care, professional and technical services, finance, and education. The distribution of residents and non-residents across these sectors differs sharply. As Table 1 shows, non-residents are overrepresented in the five highest paying sectors in the Boston economy, here approximated by Suffolk County⁸, with residents holding a higher share of jobs in each of the five lowest-paying

⁸ The American Community Survey Public Use Microdata, required for identifying residents from non-residents, does not allow researchers to distinguish whether a person works in Boston or elsewhere in Suffolk County, which also includes Chelsea, Revere and Winthrop. Boston accounts for 96 percent of county employment.

sectors. Boston residents are most overrepresented in accommodation and food services, a sector that employs 9.5 percent of residents working in Boston, but pays full-time, full year workers a median annual wage of just \$30,000. {TABLE 1}

The disparity in pay between resident and non-resident workers reflects these differences in employment by industry. The median annual income for residents of Boston who work in the city is \$36,000, whereas the median non-resident makes \$56,000. This gap barely shrinks when omitting currently enrolled students; the median working resident not enrolled in school makes \$41,000, 32 percent less than the non-resident median of \$60,000.

TABLE 1: JOBS IN SUFFOLK COUNTY BY MEDIAN INCOME AND EMPLOYMENT SHARE BY RESIDENCE

	MEDIAN INCOME AMONG FULL-TIME, FULL-YEAR WORKERS	SHARE OF EMPLOYMENT	
		BOSTON RESIDENTS	NON-RESIDENTS
Finance and Insurance	\$88,000	8.1%	12.9%
Professional and Technical Services	\$80,000	11.1%	12.8%
Utilities	\$72,000	0.4%	0.6%
Information	\$70,000	2.1%	2.6%
Government	\$65,000	5.8%	6.6%
Educational Services	\$60,000	12.2%	9.6%
Construction	\$58,000	3.6%	5.5%
Real Estate and Rental and Leasing	\$55,000	2.4%	2.3%
Manufacturing	\$55,000	2.3%	3.2%
Health Care and Social Assistance	\$54,000	19.3%	18.2%
Transportation and Warehousing	\$50,000	3.2%	5.0%
Wholesale Trade	\$50,000	1.2%	1.8%
Arts, Entertainment, and Recreation	\$45,000	2.0%	1.4%
Retail Trade	\$40,000	7.6%	4.7%
Other Services	\$40,000	4.8%	3.3%
Administrative and Waste Services	\$37,000	4.1%	3.8%
Accommodation and Food Services	\$30,000	9.5%	5.5%
Total	\$60,000	100.0%	100.0%

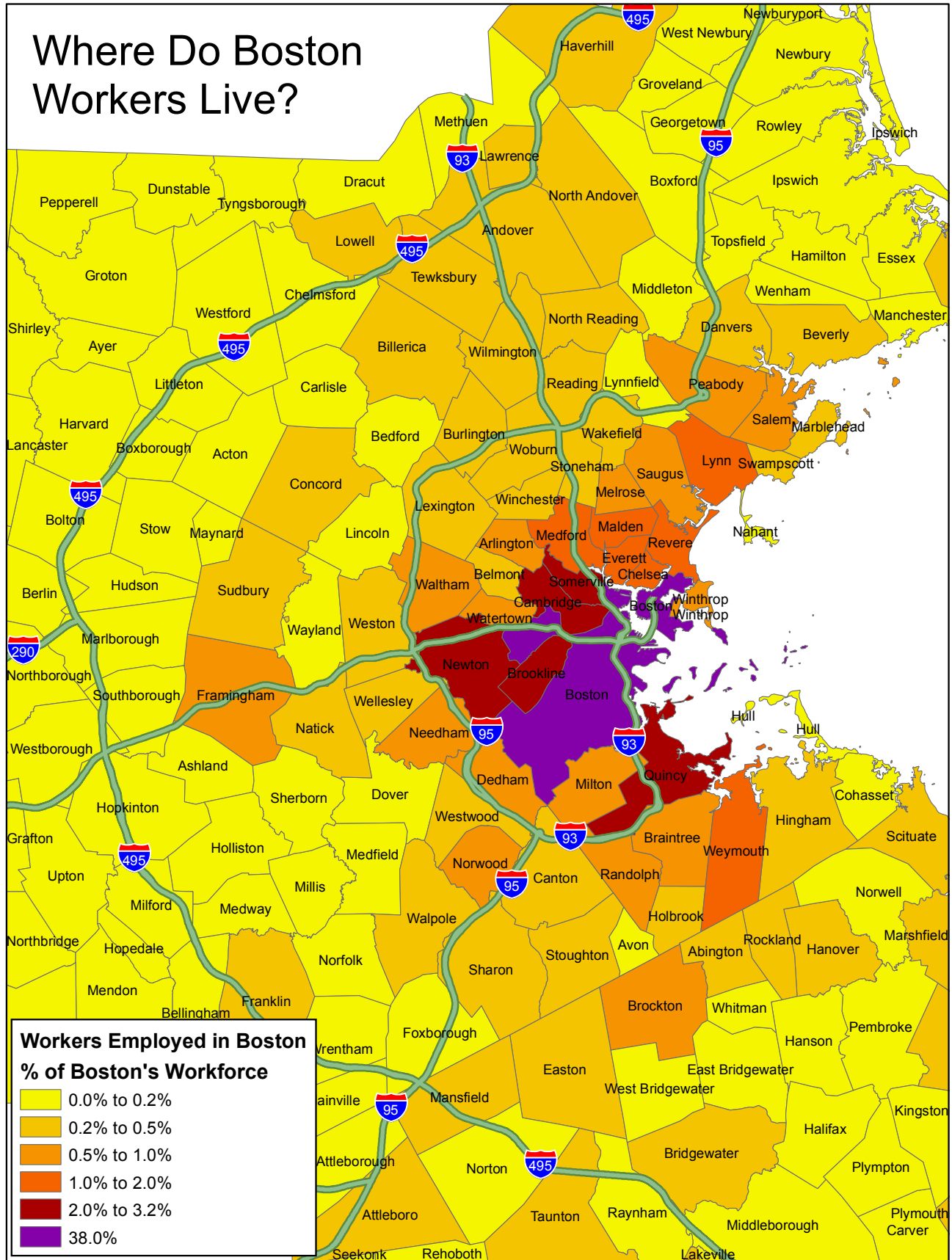
27.4% of residents employed in 5 highest paying sectors, compared to 35.5% of non-residents.

28.0% of residents employed in 5 lowest paying sectors, compared to 18.6% of non-residents.

Source: U.S. Census Bureau, 2009-2013 5-Year American Community Survey, BRA Research Division Analysis

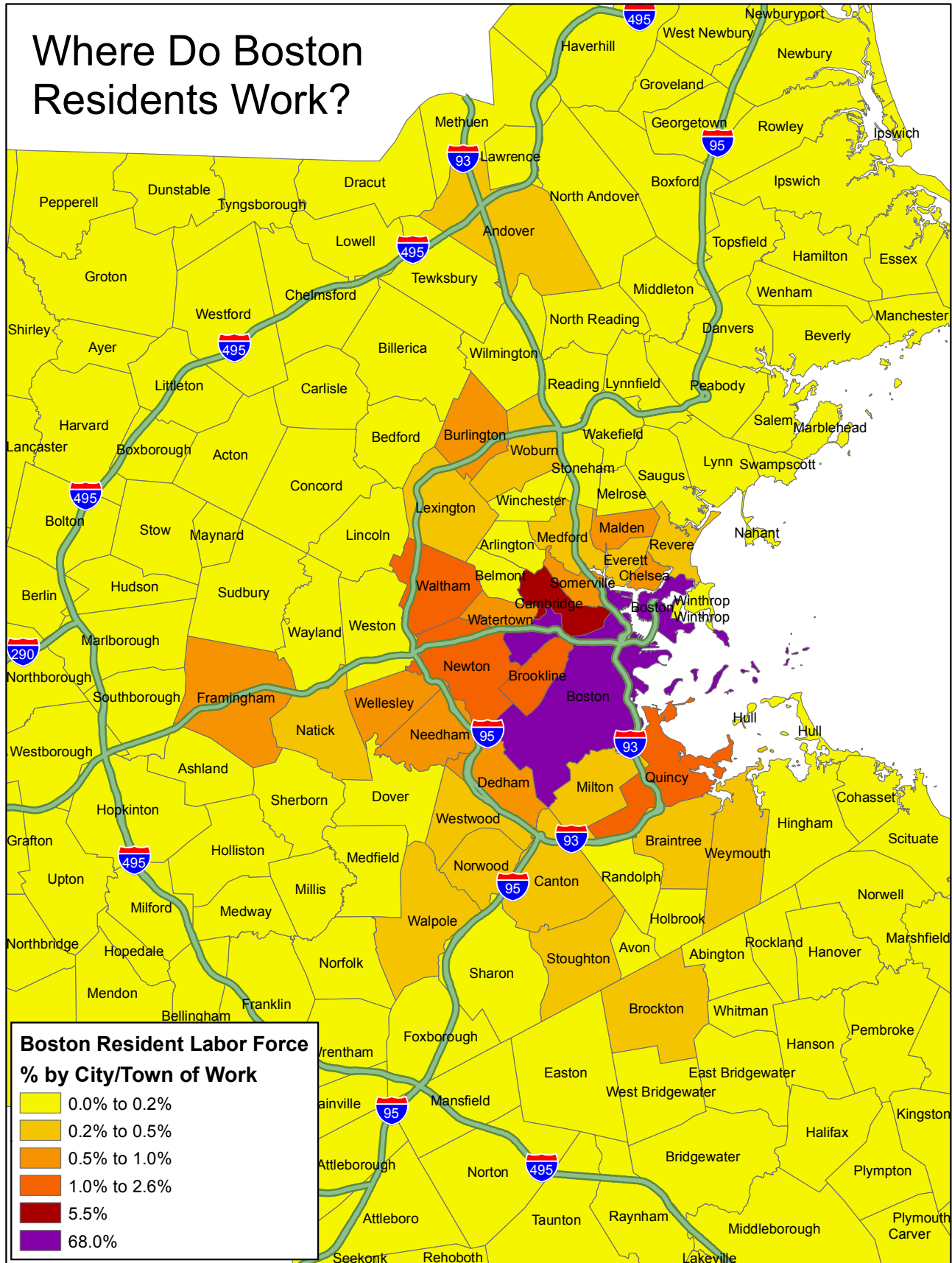
Industries that comprise less than 0.1% of total employment (Natural Resources and Mining; Management of Companies and Enterprises) are not shown.

MAP 3: PLACE OF RESIDENCE OF PEOPLE WHO WORK IN BOSTON



Source: U.S. Census Bureau, 2009-2013 American Community Survey Commuting Flows, BRA Research Division Analysis

MAP 4: PLACE OF WORK FOR BOSTON RESIDENTS



Source: U.S. Census Bureau, 2009-2013 American Community Survey Commuting Flows, BRA Research Division Analysis

EDUCATIONAL ATTAINMENT EXPLAINS ONLY PART OF THE GAP

Differences in educational attainment between residents and in-commuters help to explain some of this discrepancy, but large earnings gaps remain by education level. Table 2 shows that residents are over-represented in all education groups without a college degree, with almost twice as high a share lacking even a high school degree. Non-residents are particularly over-represented among advanced degree holders. Still, at each level of educational attainment, the median earnings of residents lag significantly behind non-residents. {TABLE 2}

Boston residents and non-residents working in Boston differ along a number of dimensions beyond educational attainment. Larger shares of residents are Black, Hispanic, and female. Residents are younger on average, and are more likely to be foreign-born or lack English proficiency. In all of these cases, the groups better represented in the Boston resident population also have lower earnings on average both locally and nationally.

A linear regression was performed to examine the role of this broad set of factors in explaining the resident earnings gap. We model earnings as a log-linear function of years of schooling, an indicator for school enrollment, a polynomial in potential work experience, indicator variables for each race and sex pair (i.e. Black males, Black females, Hispanic males, etc.), and indicators for foreign-born and those lacking citizenship or English proficiency.⁹ We focus on a group with high attachment to the labor force: full-time, full-year workers ages 25 to 64. A higher share of Boston residents work part time, which may reflect in part their disadvantaged position in the labor market, but may also indicate the unwillingness of non-residents to commute long distances for short hours.

Within this full-time, full-year sample, residents earn 25 percent less on average than non-residents, a

⁹ Earnings regressions of this form are common in the labor economics literature dating back to the work of Jacob Mincer. See Altonji and Blank (1999) for a similar application in the context of earnings gaps by race and gender.

gap somewhat smaller than the median gap among all earners seen above. Differences in education and work experience explain a little less than half of this disparity, leaving a 14 percent earnings gap. Adding in controls for race, gender, foreign birth, citizenship and limited English proficiency reduces the gap to 8 percent, about a third of its original value. About half the remaining gap can be explained by the inclusion of occupation and industry controls, meaning that Boston residents are both placing into lower paying industries and occupations, and earning lower pay within these categories, even when controlling for education and demographic factors.

As discussed above, racial differences in earnings may stem from many factors, and the literature on the gender earnings gap is also extensive.¹⁰ Some of the factors driving racial earnings gaps, such as racial discrimination, may affect minority workers regardless of place of residence, while others, like limited transportation access, limited access to high-quality affordable childcare, and the impacts of concentrated neighborhood poverty, may be particularly acute for those living in certain areas of the city.

Though a precise understanding of the root causes of the resident income gap may remain elusive, the message is clear: too many Boston residents, and too many women and minorities in particular, are missing out on the rewards of the city's economic growth.

NOT ALL BOSTON RESIDENTS WORK IN BOSTON

Focusing on jobs in Boston ignores the substantial share of Boston residents who find employment elsewhere in the region. Almost a third of employed Bostonians (32 percent) leave the city for work. The highest share (5.5 percent of resident workers) commutes to neighboring Cambridge, with concentrations emanating out along the region's major highway corridors. {MAP 4}

¹⁰ See, for instance, the essays in the 2008 volume "The Declining Significance of Gender?" edited by Blau, Brinton and Grusky for an overview of contemporary research on gender pay differences. Claudia Goldin's 2014 American Economic Association Presidential Lecture examines the changes that will be necessary if progress is to be made in closing the remaining gap.

TABLE 2: EARNINGS AND EDUCATION FOR BOSTON RESIDENTS AND NON-RESIDENTS WORKING IN SUFFOLK COUNTY AND NOT ENROLLED IN SCHOOL

	LIVES IN BOSTON		LIVES OUTSIDE OF BOSTON	
	PERCENT OF BOSTON RESIDENTS	MEDIAN INCOME	PERCENT OF NON-RESIDENTS	MEDIAN INCOME
Less Than High School	9.1%	\$20,000	4.6%	\$25,300
High School or Equivalent	20.4%	\$29,000	17.2%	\$37,500
Some College, No Degree	13.6%	\$32,100	12.6%	\$46,000
Associate's Degree	5.0%	\$37,400	6.4%	\$55,000
Bachelor's Degree	30.1%	\$52,000	31.9%	\$65,000
Advanced Degrees	21.8%	\$68,000	27.3%	\$89,000
Total	100.0%	\$41,000	100.0%	\$60,000

Source: U.S. Census Bureau, 2009-2013 5-Year American Community Survey, BRA Research Division Analysis
 Sample is the non-institutionalized civilian population that works in Boston, ages 16 and above, who are not currently enrolled in school.

Boston residents who work in the city, here approximated by Suffolk County due to data constraints, earn similar incomes to Boston residents who work outside, both in total and at each level of education. As depicted in the last row of Table 3, among those not currently enrolled in school, the difference in the median income between those working inside and outside of the county is only \$2,000. The educational distributions are broadly similar, though those commuting out are somewhat more likely to hold a bachelor's or advanced degree, compared to a only a high school degree or some college. The part-time share of employment among those working within the county is only slightly higher, at 24.7 percent compared to 22.1 percent for those commuting out. {TABLE 3}

Differences are more apparent at the industry level. Boston residents who work within the county are more

likely to work in the city's clusters of health care and social assistance, finance and insurance, and public administration compared to those commuting out. Jobs in manufacturing, retail, and wholesale trade are more likely to be found outside the county. The disparity in manufacturing is particularly striking, with the sector employing 8.1 percent of those commuting out compared to only 2.2 percent of those working within the county. The city's workforce system needs to have a regional focus when training and placing workers in the manufacturing industry.¹¹ {TABLE 4}

¹¹ See Sheila Jackson's recent report published by Jobs for the Future for more detail on recent progress in forging regional partnerships in Massachusetts to tackle workforce development challenges in advanced manufacturing industries.

TABLE 3: INCOMES AND EDUCATION OF BOSTON RESIDENTS NOT ENROLLED IN SCHOOL WORKING INSIDE AND OUTSIDE SUFFOLK COUNTY

	WORKS IN SUFFOLK COUNTY		WORKS OUTSIDE SUFFOLK COUNTY	
	% OF THOSE WHO WORK IN SUFFOLK COUNTY	MEDIAN INCOME	% OF THOSE WHO WORK OUTSIDE SUFFOLK	MEDIAN INCOME
Less than High School	9.1%	\$20,000	9.9%	\$20,000
High School or Equivalent	20.4%	\$29,000	18.1%	\$30,000
Some College, No Degree	13.6%	\$32,100	11.7%	\$32,000
Associate's Degree	5.0%	\$37,400	4.3%	\$36,000
Bachelor's Degree	30.1%	\$52,000	32.8%	\$52,000
Advanced Degrees	21.8%	\$68,000	23.3%	\$70,000
Total	100.0%	\$41,000	100.0%	\$43,000

Source: U.S. Census Bureau, 2009-2013 American Community Survey, BRA Research Division Analysis. Sample is the non-institutionalized civilian population, aged 16 and above, that worked last week and is not currently enrolled in school.

TABLE 4: INDUSTRY BY LOCATION OF WORK

INDUSTRY	PERCENT OF BOSTON RESIDENTS WORKING IN SUFFOLK COUNTY	PERCENT OF BOSTON RESIDENTS WORKING OUTSIDE SUFFOLK COUNTY
Industries where a greater proportion of Boston workers work in Suffolk County:		
Health Care and Social Assistance	19.3%	15.8%
Finance and Insurance	8.1%	5.5%
Government	5.8%	2.2%
Industries where a greater proportion of Boston workers work outside Suffolk County:		
Retail Trade	7.6%	10.6%
Manufacturing	2.3%	8.0%
Wholesale Trade	1.2%	2.2%

Source: U.S. Census Bureau, 2009-2013 American Community Survey, BRA Research Division Analysis. Note: the population sample is restricted to labor force participants age 16 and above.

SECTION 3

THE FUTURE OF EMPLOYMENT IN BOSTON: OPENINGS AND SKILLS IN DEMAND

Boston's labor market has seen robust job growth since 2010, with the city surpassing its pre-recession job count by 2011 and continuing to add more than 10,000 jobs a year through 2013, the most recent year for which full employment data are available. The pace of growth in payroll employment quickened in 2014, with more than 15,000 jobs being added in Boston, though data on non-payroll employment (the self-employed, and those not covered by unemployment insurance) are not yet available. With the resident unemployment rate falling to 4 percent in the spring of 2015, Boston's engine of job creation appears strong.

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Digging deeper into the job growth numbers reveals more concerning trends, particularly for those with less than a Bachelor's Degree. Over 80 percent of workers in Professional and Technical Services, the city's fastest growing sector and one of its highest paying, have a Bachelor's Degree. On the other end of the spectrum, Accommodation and Food Services added over 8,000 jobs, third most of any sector, but pays a median wage of only \$30,000 to full-time employees, and employs over 40 percent of its workforce part-time. While Health Care and Social Assistance, the largest and second fastest growing sector in the city, offers a broader range of opportunities to people throughout the education distribution, it stands out as an exception amidst a picture of increasing labor market polarization. {FIGURE 12}

This phenomenon is not unique to Boston, as growing inequality, a shrinking middle class, and stagnant incomes at the bottom of the distribution continue to make headlines nationally. It is, however, particularly pronounced in Boston, where sectors like finance and high tech employ college educated workers at high wages, and those without a college degree are heavily concentrated in low paying personal service industries. A report by the Brookings Institution found that Boston had the highest level of income inequality among American cities in 2014.

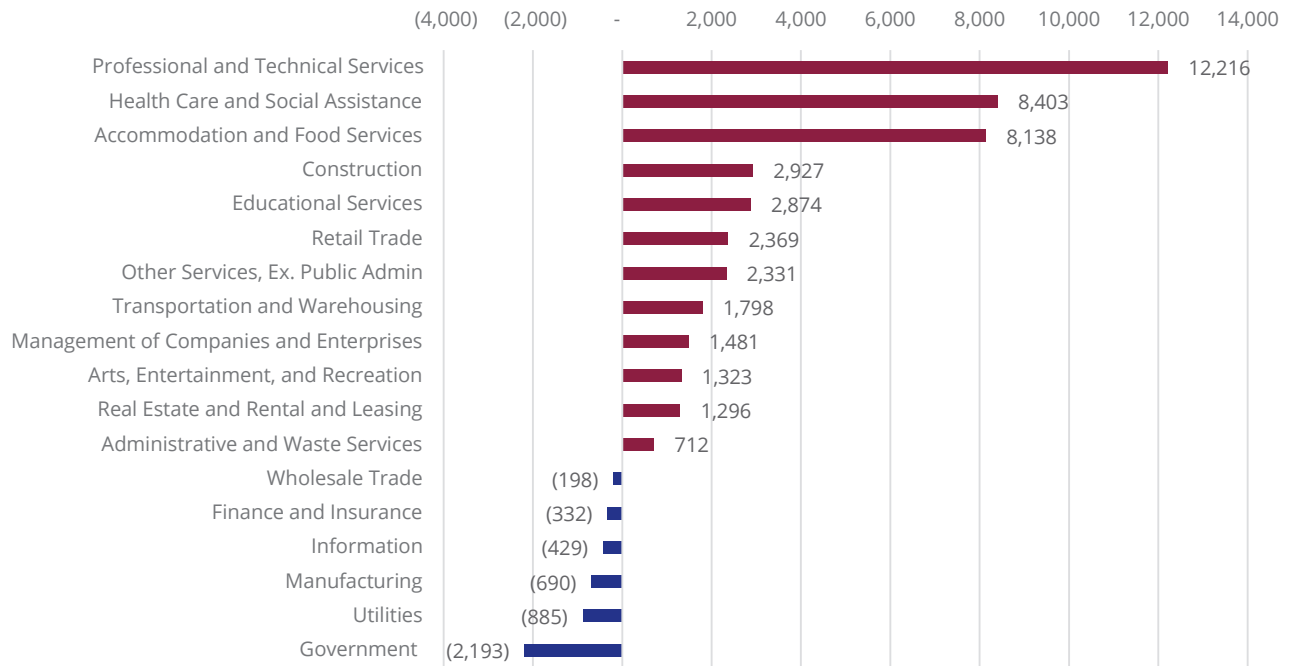
The national decline in well-paying jobs for workers with less than a college degree is generally attributed to a combination of technological change, globalization, and institutional factors such as the falling

share of workers belonging to labor unions. Sectors like manufacturing were particularly hard hit, and this is reflected in Boston, where the number of manufacturing jobs has fallen from roughly 70,000 in 1969 to fewer than 10,000 in 2013. Office workers such as bookkeepers and bank tellers have seen many of the tasks they used to perform taken over by computers, while telephone customer service has been subject to outsourcing.

The Occupational Information Network (O*NET) database, developed by the US Department of Labor, provides a wealth of information about the skill, education and training requirements and the tasks performed by workers in the over 800 detailed occupations throughout the country. When matched to information on current and projected employment in Boston from the State's Executive Office of Labor and Workforce Development (EOLWD), these data illustrates the opportunities available across the education spectrum in the Boston labor market.

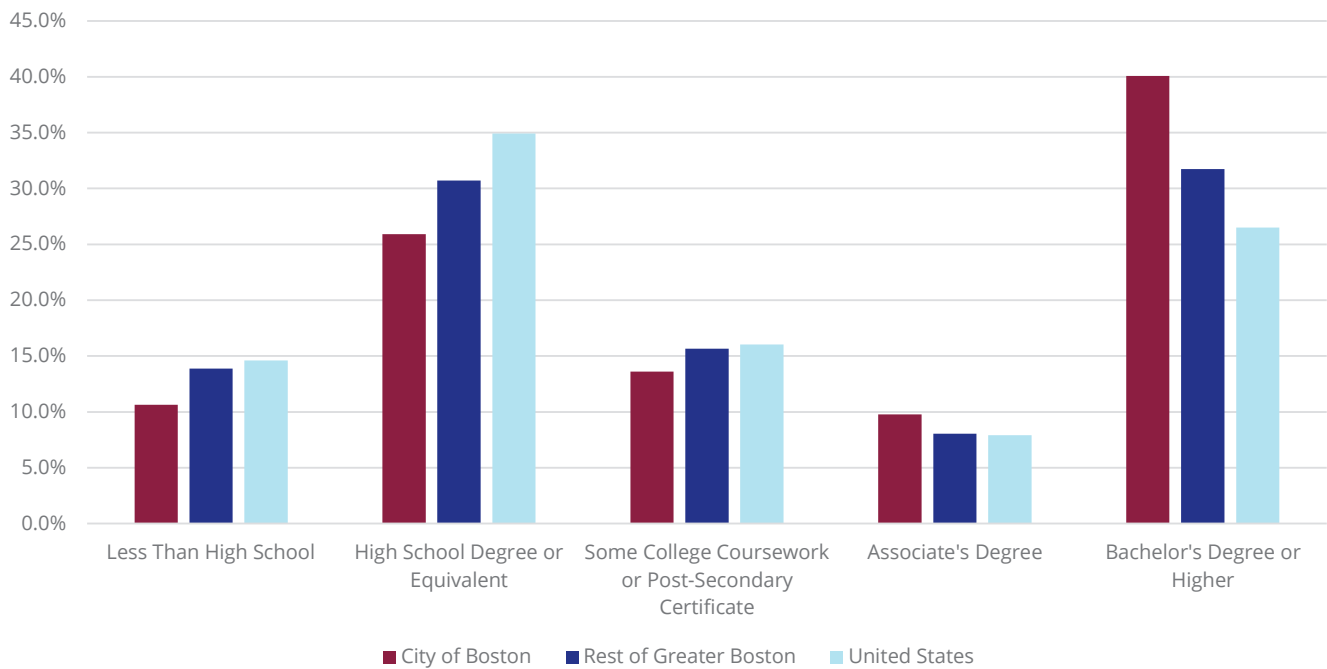
Figure 13 shows the share of projected openings through the year 2022 by education required for Boston and the nation as a whole. Job openings in the Boston area, and particularly those in the city itself, are more likely to require a Bachelor's Degree. A Bachelor's Degree is a prerequisite for 40.5 percent of jobs locally, compared to 26.5 percent nationally. Only 36.3 percent of jobs locally might be available to someone with a high school degree or less, compared to 49.5 percent nationally. {FIGURES 13}

FIGURE 12: CHANGE IN EMPLOYMENT BY INDUSTRY: 2010-2013



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

FIGURE 13: OPENINGS BY EDUCATION REQUIRED BASED ON O*NET DATABASE



Source: Occupation and Employment Statistics; O*NET Database; BRA Research Division Analysis.

Breaking down the local data, an even higher percentage (46.1%) of growth openings, those being created by employment expansion in a given occupation, require at least a Bachelor's Degree. Replacement openings, those arising due to retirements or people leaving one job for another, require somewhat less education. Both growth and replacement openings can lead to good employment opportunities, but a higher percentage of replacement openings occur in high churn industries. In a well-functioning workforce development system these jobs serve as stepping stones to higher paying stable employment, moving one person up the career track while creating an entry-level opportunity for another. Without a system in place to facilitate that upward movement it is more likely that the same worker will move between these unstable jobs with little possibility of advancement. {FIGURE 14}

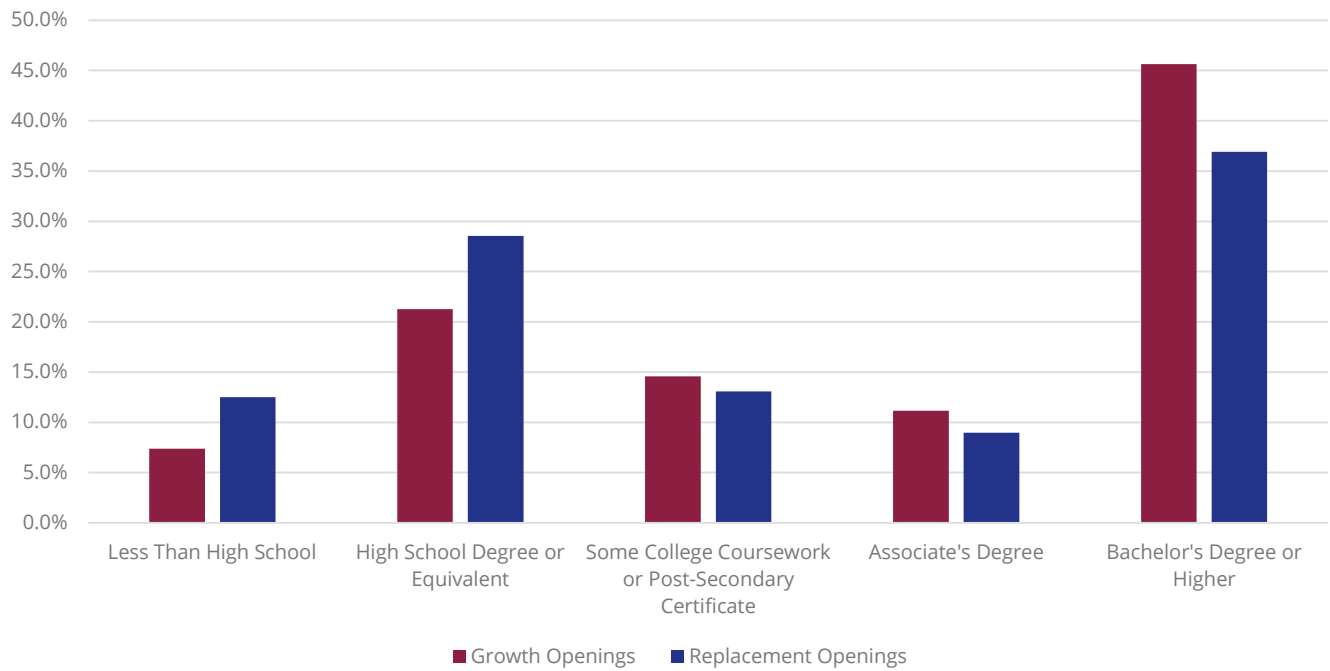
O*NET data are intended to capture the percentage of jobs at the national level in a particular occupation that require a given level of education to perform the job. This may underestimate the true educational requirements in the Boston labor market, where workers holding bachelor's degrees are far more common than in the country at large.¹² Figure 15 compares the

¹² Mark Melnik (2014) explores this issue of an "educational requirement markup" in the Boston labor market in depth using similar data sources to those presented here. Modestino, Shoag, and Ballance (2015) explore the impact of the recession on "upskilling" nationwide using job vacancy postings and show that the greater supply of educated workers looking for work similarly allowed employers to increase educational requirements within narrowly defined occupations.

O*NET educational requirements for current jobs in Boston to those holding those jobs, as well as to Boston's resident labor force. The educational attainment of Boston residents actually looks fairly well-suited to the distribution of jobs available according to O*NET, but it lags substantially behind the educational attainment of the mix of city and area residents currently holding jobs in Boston. The high level of educational attainment of the overall Greater Boston workforce means that employers are often weighing candidates with a college education against potentially qualified workers without one. {FIGURE 15}

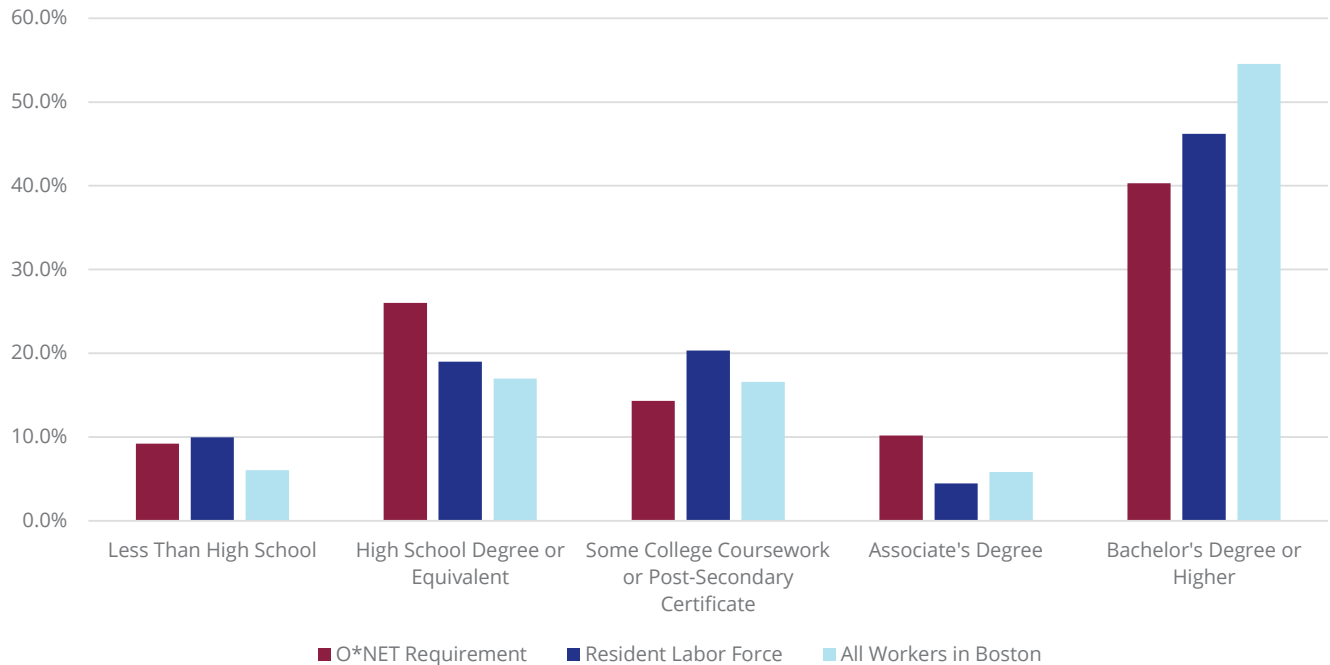
This poses an extra challenge for the workforce development system, as levels of post-secondary training that have high value elsewhere may still leave workers here competing against bachelor's degree holders that employers prefer. The proper response may depend on the individual. In some cases, workers whose education might otherwise have terminated with a certificate or associate's degree should plot pathways that lead to the completion of a bachelor's degree. Others should focus on training programs where non-college educated workers can acquire skills and certifications not typically held by bachelor's degree holders. Partnering with employers to understand their specific training needs may allow workforce development programs to carve out niches for middle-skilled workers where bachelor's degree holders will have more trouble competing.

FIGURE 14: GROWTH OPENINGS AND REPLACEMENT OPENINGS BY EDUCATION REQUIRED



Source: Occupation and Employment Statistics; O*NET Database; BRA Research Division Analysis.

FIGURE 15: EDUCATIONAL REQUIREMENTS VERSUS CREDENTIALS CURRENTLY HELD



Source: Occupation and Employment Statistics; O*NET Database; BRA Research Division Analysis.

OPENINGS FOR WORKERS WITH A HIGH SCHOOL DEGREE OR LESS

Despite the high demand for college educated workers in Boston, there will remain a large number of openings in the area for those with a high school education or less. Table 5 shows the 20 occupations requiring no more than a high school degree with the largest number of projected annual openings over the next decade, along with the average annual income earned by full-time workers in these occupations in Boston, and the level of English language ability required for the job. The low average pay in these occupations is apparent: of the 20 listed, 13 pay less than \$35,000 a year, with eight below \$30,000. Among the jobs with higher pay, such as Office Managers or Bookkeeping and Accounting Clerks, substantial experience is often required, and in many cases high school educated workers will be competing with applicants with higher levels of education for these positions. {TABLE 5}

As the last column shows, the higher paying jobs on the list also require levels of English proficiency above the median for occupations nationally. The English requirement is calculated based on averaging O*NET data on the level of reading, writing and speaking required in each occupation. These averaged scores are then ranked and weighted by national level employment, so a score of 4 indicates an occupation with English language requirements higher than jobs employing 75 percent of the national workforce. A score of 1 indicates that reading, writing and speaking requirements are lower than those in jobs employing 75 percent of the national workforce. All but one of the jobs in the first quartile of language proficiency average full-time pay of less than \$35,000 a year. Opportunities for advancement beyond this level without additional English language training will be limited.

TABLE 5: MOST OPENINGS AMONG OCCUPATIONS WITH ENTRY-LEVEL REQUIREMENT OF HIGH SCHOOL DEGREE OR LESS

DETAILED OCCUPATION	ANNUAL OPENINGS	AVERAGE INCOME	MINIMUM REQUIREMENT	LANGUAGE REQUIREMENT QUARTILE
Waiters and Waitresses	618	\$32,118	Less Than High School	1
Retail Salespersons	450	\$25,217	Less Than High School	2
Customer Service Representatives	387	\$44,245	High School Diploma or Equiv.	3
Cashiers	323	\$22,150	Less Than High School	1
Combined Food Preparation and Serving Workers, Including Fast Food	313	\$22,271	Less Than High School	1
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	269	\$32,541	Less Than High School	1
First-Line Supervisors of Office and Administrative Support Workers	240	\$69,169	High School Diploma or Equiv.	4
Cooks, Restaurant	226	\$29,489	Less Than High School	1
Office Clerks, General	223	\$36,518	High School Diploma or Equiv.	3
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	186	\$45,340	High School Diploma or Equiv.	4
Bartenders	177	\$32,514	Less Than High School	2
Parking Lot Attendants	177	\$22,865	Less Than High School	1
Security Guards	167	\$32,558	High School Diploma or Equiv.	2
Laborers and Freight, Stock, and Material Movers, Hand	163	\$37,456	Less Than High School	1
Maids and Housekeeping Cleaners	156	\$33,457	Less Than High School	1
Dishwashers	145	\$22,833	Less Than High School	1
First-Line Supervisors of Food Preparation and Serving Workers	141	\$38,703	High School Diploma or Equiv.	3
Bookkeeping, Accounting, and Auditing Clerks	138	\$47,354	High School Diploma or Equiv.	3
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	133	\$20,377	Less Than High School	2
Home Health Aides	133	\$26,885	Less Than High School	2

Source: Occupation and Employment Statistics; O*NET Database; BRA Research Division Analysis.

ADVANCEMENT POTENTIAL FOR WORKERS WITH NO MORE THAN A HIGH SCHOOL DEGREE

The low average wages in occupations with openings for high school graduates are troubling, and this is made all the more concerning by the low possibilities for advancement that many of these jobs offer. The occupations with openings for workers with no more than a high school degree are overwhelmingly concentrated in a few broader groupings, most prominently Food Preparation and Serving and Office and Administrative Support. Table 6 shows 2014 employment and wages for the eleven occupation groupings most likely to employ less educated workers. Two wages are shown: an “entry-level” wage calculated as the average of the bottom third in each group, and an “experienced” wage, the average of the remaining top two-thirds. The final column shows the percent of workers employed in each occupation group that hold less than a bachelor’s degree. {TABLE 6}

Even experienced workers in Food Preparation and Serving, Building and Grounds Cleaning and Maintenance, and Personal Care and Service occupations are struggling to make family-sustaining wages. While employment growth in the service sector remains strong, both locally and nationally, wage gains have not followed. This poses a challenge for the workforce development system.

Office and Administrative Support and Sales and Related Occupations have wider income variation, but also higher percentages of employees with bachelor’s degrees, who likely are clustered towards the top of these occupations’ income distributions. Protective Service Occupations include private security guards at the lower end of the wage spectrum, and police and firefighters who earn considerably more. In each of

these cases, the pathways between occupations within the broader group are not well-established.

The Production, Installation and Maintenance, and Construction Occupations in the three groups at the bottom of the list have more promising income growth opportunities, but account for the smallest share of overall employment. Programs aimed at training and placing workers into these occupations can have high returns, but require coordination with employers to ensure that training is appropriate to local needs, and that sufficient openings exist to hire program graduates.

With Boston in the midst of a building boom, Construction Occupations might offer promising opportunities. Total construction activity in Boston has shown significant growth since the Great Recession. Boston’s Resident Job Policy aims for at least 50 percent of construction worker hours to be worked by Boston residents. Construction hours for covered projects increased by 185 percent from January 2011 through December 2014. However, only about 31 percent of construction worker hours were worked by Boston residents since 2013. Recruitment, training, and apprenticeship programs may help increase the number of Boston residents qualified for these construction jobs.

Healthcare Support Occupations include only the lower wage end of overall healthcare occupations, with Healthcare Practitioners and Technical Occupations covering the middle and higher wage jobs. While the highest salary positions require Medical Degrees that take years to earn, workers with a high school degree can create pathways towards middle wage jobs through credentials that substantially enhance earnings potential without requiring a bachelor’s degree.

TABLE 6: EMPLOYMENT AND WAGES IN OCCUPATION GROUPS EMPLOYING LESS EDUCATED WORKERS

OCCUPATION GROUP	EMPLOYMENT, 2014	INCOME, BOTTOM THIRD	INCOME, TOP TWO-THIRDS	% EMPLOYED WITH LESS THAN BA
Office and Administrative Support Occupations	80,490	\$28,906	\$55,501	67.4%
Food Preparation and Serving Related Occupations	49,830	\$18,803	\$33,915	83.9%
Sales and Related Occupations	46,980	\$19,846	\$78,799	49.1%
Transportation and Material Moving Occupations	18,180	\$20,660	\$45,705	86.8%
Healthcare Support Occupations	15,970	\$26,289	\$42,682	78.2%
Protective Service Occupations	15,940	\$24,809	\$59,993	61.6%
Building and Grounds Cleaning and Maintenance Occupations	15,340	\$23,678	\$39,040	92.7%
Personal Care and Service Occupations	15,240	\$19,701	\$35,437	77.0%
Production Occupations	10,950	\$22,665	\$50,437	85.8%
Installation, Maintenance, and Repair Occupations	10,420	\$35,670	\$65,725	87.0%
Construction and Extraction Occupations	9,450	\$43,199	\$82,277	90.9%

Source: Occupation and Employment Statistics; US Census Bureau, 2009-2013 American Community Survey BRA Research Division Analysis.

OPENINGS FOR WORKERS WITH ASSOCIATE'S DEGREES OR POST-SECONDARY CERTIFICATION

Table 7 shows the 22 occupations with the most annual openings where the entry-level credential is more than a high school diploma but less than a bachelor's degree, along with the average income among those employed full-time in these occupation in Boston. The final column shows the percent of workers employed in these occupations in Boston who hold a bachelor's degree. {TABLE 7}

Registered Nursing, which has the most projected annual openings of any occupation in Boston over the next decade, illustrates the requirement markup issue discussed above. According to O*NET, 23 percent of jobs in registered nursing require a bachelor's degree, while the remaining 77 percent require an associate's degree or another post-secondary certification. Even

though an associate's degree is the minimum qualification necessary to be certified as an RN in Massachusetts, over 80 percent of RNs who work in Boston hold a bachelor's degree. A worker with only an associate's degree may have difficulty finding employment in the field despite possessing the minimum necessary credential. The same holds true for Web Developers, where 83.5 percent of those employed in Boston hold a bachelor's degree.

The rest of the occupations seem more likely to hire candidates possessing the minimum required credential listed here. Comparing with Table 5, the return to post-secondary training is evident. Whereas only a third of occupations requiring a high school degree or less paid over \$35,0000 on average, all but three of the occupations listed here clear that threshold. Half pay average incomes of over \$50,000.

TABLE 7: MOST OPENINGS AMONG OCCUPATIONS WITH ENTRY-LEVEL REQUIREMENT GREATER THAN HIGH SCHOOL DEGREE BUT LESS THAN BA

DETAILED OCCUPATION	ANNUAL OPENINGS	AVERAGE INCOME	MINIMUM REQUIREMENT	% EMPLOYED IN THIS OCC. WITH AT LEAST A BA
Registered Nurses	795	\$96,485	Associate's degree	81.2%
Nursing Assistants	171	\$34,414	Postsecondary Certification	25.4%
Medical Assistants	154	\$40,627	Postsecondary Certification	13.1%
Computer User Support Specialists	116	\$63,719	Some College Coursework	45.3%
Hairdressers, Hairstylists, and Cosmetologists	93	\$30,856	Postsecondary Certification	11.1%
Paralegals and Legal Assistants	92	\$59,456	Associate's degree	59.1%
Medical and Clinical Laboratory Technicians	89	\$42,356	Associate's degree	51.1%
Preschool Teachers, Except Special Education	87	\$36,468	Associate's degree	18.4%
Medical Records and Health Information Technicians	81	\$43,596	Postsecondary Certification	20.7%
Licensed Practical and Licensed Vocational Nurses	71	\$56,215	Postsecondary Certification	3.0%
Web Developers	68	\$76,531	Associate's degree	83.5%
Teacher Assistants	67	\$30,467	Some College Coursework	34.6%
Emergency Medical Technicians and Paramedics	57	\$44,923	Postsecondary Certification	22.1%
Environmental Science and Protection Technicians, Including Health	41	\$44,968	Associate's degree	56.9%
Radiologic Technologists	41	\$70,664	Associate's degree	29.6%
Firefighters	35	\$82,091	Postsecondary Certification	28.0%
Heavy and Tractor-Trailer Truck Drivers	34	\$50,689	Postsecondary Certification	11.0%
Surgical Technologists	32	\$50,047	Postsecondary Certification	28.4%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	30	\$63,189	Postsecondary Certification	12.3%
Library Technicians	24	\$47,404	Postsecondary Certification	26.6%
Respiratory Therapists	24	\$74,126	Associate's degree	33.1%
Dental Hygienists	24	\$81,982	Associate's degree	44.9%

Source: Occupation and Employment Statistics; O*NET Database; BRA Research Division Analysis.

CONCLUSION

Boston's economy is booming, but many Boston residents continue to struggle to make ends meet. The unemployment rate has fallen to pre-recession levels, but the median income has remained unchanged for a generation. A quarter of full-time, full-year workers, and just under half of all labor force participants, earn less than \$35,000.

Looking ahead, the Office of Workforce Development must work to make opportunities for economic advancement available to all residents. Labor demand in the city is projected to continue to be robust, with openings created both by growth in core industries and jobs vacated by the large cohort nearing retirement age. Ensuring that residents are prepared with the education and training they need to meet coming labor demand is essential. Furthermore, the workforce development system needs to engage employers to understand their needs and connect residents to jobs across the industry spectrum. The Office of Workforce Development is committed to turning the continued economic strength of the city of Boston into shared prosperity and economic opportunity for all of its residents.



Report prepared by the Boston Redevelopment Authority (BRA) Research Division for the Mayor's Office of Workforce Development.

THE BOSTON REDEVELOPMENT AUTHORITY RESEARCH DIVISION (BRA)

We strive to understand the current environment of the city to produce quality research and targeted information that will inform and benefit the residents and businesses of Boston. Our Division conducts research on Boston's economy, population, and commercial markets for all departments of the BRA, the City of Boston, and related organizations.

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