

MOBILIZING FOR OPPORTUNITY



CONNECTING LOW-INCOME COLLEGE STUDENTS
TO INTERNSHIPS AND GOOD FIRST JOBS

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for

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Introduction and Report Highlights

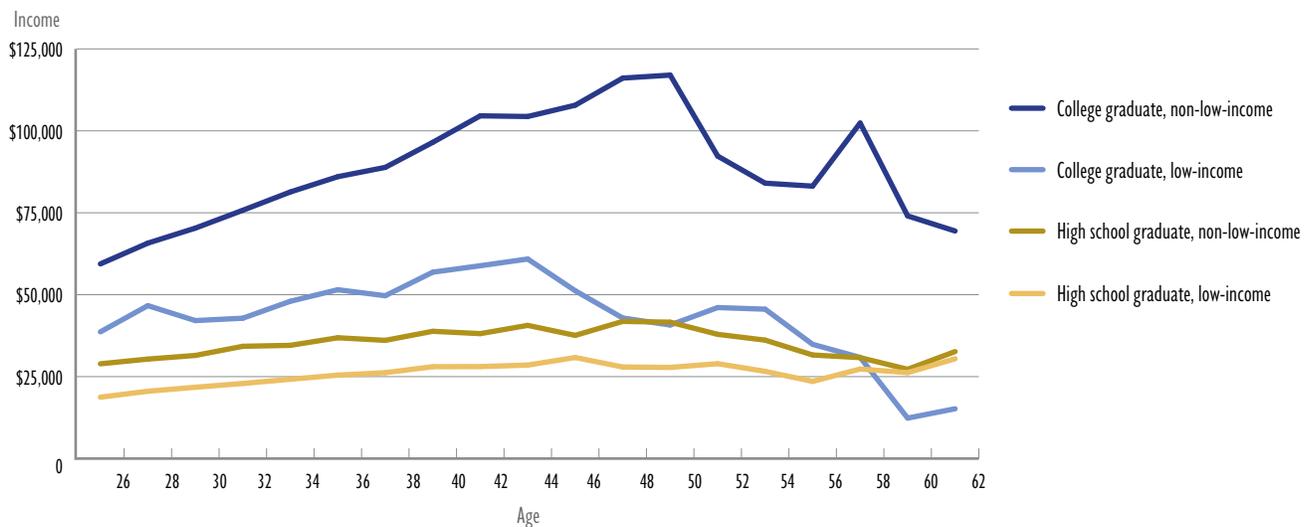
Fueled by Success Boston, the citywide college completion initiative, Boston has raised the postsecondary enrollment and completion rates of Boston high school graduates over the past decade.¹ But while these efforts to boost college success after high school are critical, evidence is mounting that a postsecondary credential is not sufficient to connect students to well-paying jobs with advancement opportunities. National research shows that over 40% of four-year college graduates fail to land a “good” first job, defined as a job that typically requires a bachelor’s degree, with two-thirds of these graduates underemployed five years later.² By contrast, just one in ten graduates who land a bachelor-level first job slip into underemployment after five years.

Students from low-income backgrounds are especially likely to miss out on the economic advantage expected

from a bachelor’s degree, with low-income college graduates earning only half as much as their peers born into the middle class over their lifetime (see **Figure 1**).³ The findings from these national studies highlight the importance of landing a good first job as a springboard to career advancement and growth. While a good first job does not guarantee long-term career success, it certainly increases its likelihood.⁴

Locally, the 2019 *Boston Globe* report on the career outcomes of Boston’s high school valedictorians from 2005 to 2007 highlights the struggles faced by first-generation and low-income students, who are now in their late 20s and early 30s and have yet to achieve career success. A decade and a half after graduating from high school, 40% of these valedictorians still earned less than \$50,000 a year, even though 75% had earned a college degree. With so many of these top

FIGURE 1
Estimated Career Earnings Profiles by Education and Family Income
Annual earnings, 2014 dollars



SOURCE: Bartik, Timothy J. and Brad J. Hershbein. 2016. “College Grads Earn Less if They Grew Up Poor.” Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Boston high school graduates finding it hard to get on a career track, it is critical to understand how the broader population of Boston Public Schools (BPS) graduates are faring in the labor market.

With support from the Boston Foundation, a team of organizations—NextGen Talent, the Boston Private Industry Council, and Burning Glass Technologies—conducted research to assess how well BPS graduates who attend four-year colleges are connecting to internships and good first jobs, along with the existing capacity in Greater Boston to support these students in attaining internships and quality employment upon graduation.

The study focuses on four-year college graduates for a number of reasons. First, there are existing definitions in labor market literature of good first jobs for bachelor's degree recipients that can be utilized for this research.⁵ Second, nearly two-thirds of Boston Public Schools graduates who enroll in college attend four-year colleges and universities. Third, the vast majority of degrees earned by BPS graduates are bachelor's degrees: Over 80% of the first postsecondary credentials earned by the BPS Class of 2011 were bachelor's degrees.⁶ Learning more about how these four-year college graduates are faring in the labor market could shed valuable light on how the city can position future students for greater economic success.⁷ The study specifically focuses on graduates of Boston district and charter high schools serving predominantly students of color from low-income backgrounds, many of whom are the first in their families to go to college.⁸ The research efforts were guided by an advisory committee representing businesses, higher education institutions, nonprofit organizations, and high schools. (For a list of advisory committee members, see **Appendix 1**.)

Since this research commenced in the fall 2019, the economic and social landscape of the city and nation has changed. As a result of the economic dislocations caused by the coronavirus pandemic, the unemployment rate in Boston went from one of the

lowest in the nation to one of the highest. In June 2020, the Boston metropolitan area unemployment rate was 16.9% compared to a rate of 2.6% for the same period last year.⁹ Job postings for new graduates also dropped precipitously. Boston area employers posted 26% fewer jobs for new graduates in the four-month period April to July 2020 compared to the same period in 2019.¹⁰ The sharp decline continued in the second half of the year, with employers posting 33% fewer jobs for new graduates from August through December of 2020, compared to the same period in 2019.

The impact of COVID-19 on employment in general and employment prospects for new graduates in particular makes this research even more important. Previous studies have shown that proactive internship and job placement services are more vital than ever during times of economic dislocation and recession, especially for low-income and first-generation college students with more limited social networks to aid their entry into the labor market.¹¹

But while economic prospects may have worsened for college graduates from Boston's low-income communities of color, corporate interest in taking action on workforce diversity has increased in response to the racial justice movement sweeping the nation. This is an important development, in light of the fact that the majority of Boston's low-income graduates are people of color who continue to confront racial prejudice in the workplace. With a growing list of companies pledging to fight systemic racism by increasing the number of people of color within their organizations,¹² the time seems ripe for Greater Boston's growth industries to take on this challenge. Initiatives designed to connect low-income Boston graduates of color to internship and job opportunities are likely to find a receptive corporate audience as the economy continues to recover from the impact of COVID-19.

Research Questions and Organization of the Report

The research explored the following questions:

- What are the first-year employment outcomes of graduates of Boston's public high schools after earning a bachelor's degree, as measured by earnings, education requirements of jobs obtained and the relationship of those jobs to the graduates' career goals?
- What factors, such as field of study and internship participation, are associated with better first-job outcomes for these students?
- How aligned is employer demand for interns and entry-level talent with the majors these students pursue at four-year colleges and universities?
- What is the gap between the number of Boston public high school graduates currently receiving internship and job placement services at local four-year colleges and the projected need for these services?
- Based on a scan of career services currently provided by college success programs, industry-based programs, and public colleges and universities, what are some promising models with potential to meet the need if provided at scale?

The report is organized into four sections:

- Description of data sources including the strengths and limitations of each source.
- Quantitative analysis of first-year post-college employment outcomes of students who graduated from a Boston district or Commonwealth charter high school serving predominantly low-income students of color.
- Estimated need for comprehensive career services among these students and existing capacity to connect them to internships and good first jobs.
- Summary of research findings and recommendations to strengthen connections to internships and good first jobs.

Report Highlights: Key Findings

Consistent with recent national studies,¹³ we found wide variation by college major in earnings and success in securing a good first job upon graduation. Nursing, engineering, and computer science majors had the highest annual earnings following graduation, while arts, humanities, psychology, education, and social science majors had the lowest earnings. Average median salaries ranged from a high of \$66,200 for nursing majors to a low of \$27,000 for visual and performing arts majors. An analysis of the majors of BPS graduates who earned a bachelor's degree from seven in-state public colleges revealed that 60% attained degrees in majors that earned below the median for all bachelor's degree earners from these colleges.

Past research has found that earnings of graduates are higher, on average, for those who obtain a first job that typically requires a bachelor's degree as an educational requirement. Our analysis of social profile data of graduates of these local colleges found large differences across majors in the ability to obtain a good first job.

The study analyzed internship experience of recent graduates to determine whether they were associated with first-year employment outcomes. We found a significant boost in first-year job outcomes across majors for students who participated in an internship or otherwise received comprehensive career counseling and placement services. Examining the programs and services now available to connect low-income Boston college students to internships and good first jobs, we also found a substantial gap between the estimated number of Boston college students who could benefit from career-connection services and organizational capacity to provide these services.

FINDINGS RELATED TO FIRST-YEAR EMPLOYMENT OUTCOMES

- 1. FIRST-YEAR EMPLOYMENT OUTCOMES OF GRADUATES OF PUBLIC COLLEGES THAT SERVE A HIGH PROPORTION OF BOSTON STUDENTS VARIED WIDELY BY MAJOR.**¹⁴ Employment in a BA-level job the year after graduation ranged from a high of 94% for nursing majors to a low of 44% for criminal justice majors, compared to an average rate of 68% across all majors. For several majors, 60% or fewer graduates achieved a BA-level job. Students pursuing professional degrees or quantitatively focused majors had the highest rates of BA-level employment and higher-than-average first-year earnings. Graduates of majors with less direct professional application to the job market, such as psychology, humanities, and the natural sciences, had lower-than-average rates of landing a BA-level job and lower-than-average earnings during the first year after college. See sidebar below for the seven public universities included in the study.
- 2. CLOSE TO 60% OF BPS STUDENTS WHO GRADUATED FROM THE PUBLIC COLLEGES INCLUDED IN THE STUDY MAJORED IN FIELDS WITH LOWER-THAN-AVERAGE EARNINGS AND RATES OF PLACEMENT IN BA-LEVEL JOBS.** BPS students were also underrepresented in two of the highest paying majors at public colleges—nursing and engineering.

THE SEVEN PUBLIC UNIVERSITIES INCLUDED IN THE REPORT

Bridgewater State University
Framingham State University
Salem State University
UMass Amherst
UMass Boston
UMass Dartmouth
UMass Lowell

- 3. THE AVERAGE STARTING SALARY OF LOW-INCOME BOSTON STUDENTS WAS APPROXIMATELY 20% LOWER THAN THE AVERAGE STARTING SALARY FOR ALL NEW ENGLAND COLLEGE GRADUATES.** The starting salary of low-income graduates from Greater Boston serviced by college-success organization Bottom Line was \$44,849 compared to a starting salary of \$55,624 for all 2018 college graduates in New England.
- 4. COLLEGE GRADUATES WHO PARTICIPATED IN AN INTERNSHIP IN COLLEGE HAD HIGHER RATES OF BA-LEVEL EMPLOYMENT, BUT ACCESS TO INTERNSHIPS VARIED WIDELY BY MAJOR.** Across the seven public colleges included in the study, students who completed at least one internship had significantly higher rates of achieving a BA-level occupation—75%, compared to 63% of students who did not have an internship. Most majors showed a 10 to 12 percentage-point benefit from internship experience. The positive association between internship experiences and subsequent BA-level employment was particularly noteworthy for liberal arts and similar majors, who have difficulty securing BA-level jobs. For example, psychology majors who participated in an internship had a 65% placement rate in a BA-level job, compared to 56% for their peers without an internship. But a relatively small percentage of students in these majors had access to an internship experience. Students majoring in humanities, psychology, and natural sciences had the lowest rate of participation at 23%. Communications majors had the highest rate of participation at 50%.
- 5. THERE WAS SIGNIFICANT VARIATION IN INTERNSHIP PARTICIPATION BY INSTITUTION, WITH UMASS BOSTON, THE PUBLIC UNIVERSITY SERVING THE LARGEST NUMBER OF BOSTON STUDENTS, HAVING ONE OF THE LOWEST RATES, AT 24%.** While more than half (53%) of all students at UMass Amherst had at least one internship, less than one quarter of UMass Boston students did so.

FINDINGS RELATED TO CAREER-CONNECTION SERVICES AND CAPACITY TO MEET PROJECTED NEED

6. PUBLIC UNIVERSITIES HAVE BEEN RAMPING UP SERVICES TO CONNECT STUDENTS TO INTERNSHIPS AND OTHER WORK-BASED LEARNING EXPERIENCES, BUT THEIR CURRENT CAPACITY IS LIMITED.

Career services and internship offices are only able to provide a fraction of the students on campus with internship preparation and connections, though some expansion efforts are under way. These include the State University Internship Incentive Program, which provides stipends to students in unpaid internships; UMass Boston's Beacon Student Success Fellowship and new Professional Apprenticeship Career Enhancement program (PACE), which promises on-campus paid internships, mentoring, and networking sessions for first- and second-year students, with a transition to paid internships off-campus in the junior and senior years; and Bridgewater State University's stated goal of 1,000 paid or funded internships by 2025.

7. A SIGNIFICANT EXPANSION OF CAPACITY IS NEEDED TO PROVIDE ACCESS TO INTENSIVE, MULTI-YEAR CAREER DEVELOPMENT SUPPORTS TO ALL LOW-INCOME BOSTON COLLEGE STUDENTS.

Bottom Line and Thrive Scholars (formerly SCS Noonan Scholars), the two college success organizations identified in the study as providing a formal system of intensive career coaching and internship/job placement services for postsecondary students, are able to serve 550 new college students each year. We estimate the annual number of low-income students who attend a college or university in Massachusetts from BPS non-exam, John D. O'Bryant and charter high schools will be 1,301 by 2023, leaving close to 750 students unable to be served by these programs.

8. CREATING SPECIALIZED TEAMS THAT CAN BECOME TRUSTED SUPPLIERS OF DIVERSE ENTRY-LEVEL TALENT TO EMPLOYERS IS A PROMISING STRATEGY FOR BOOSTING INTERNSHIP AND EMPLOYMENT OUTCOMES OF LOW-INCOME COLLEGE STUDENTS.

Both Bottom Line and Thrive Scholars have created dedicated units within their organizations that focus on recruiting and developing relationships of trust with employers. Both organizations emphasized the specialized skills and dedicated staff required to recruit employer partners and establish preferred talent sourcing relationships. The steady increase in the percentage of Bottom Line graduates securing full-time employment in positions relevant to their career goals between 2015 and 2018 provides initial evidence for the promise of this approach.

9. INDUSTRY-FOCUSED INTERNSHIP PROGRAMS THAT AGGREGATE EMPLOYER DEMAND OFFER SIGNIFICANT ADVANTAGES OVER AD HOC RECRUITMENT MODELS.

Industry-focused programs that centralize internship opportunities are able to connect employer partners with college success organizations and university career centers in a way that is much harder to achieve institution by institution. Well-established internship programs hosted by the Massachusetts Life Science Center, the Massachusetts Clean Energy Center, and the Massachusetts Technology Collaborative collectively sponsored 1,326 internships to students statewide in 2019, and they partner with universities to recruit students for these placements, though these programs do not explicitly focus on low-income college students. Some industry associations have also launched internship programs with an explicit goal of serving low-income college students and students of color. These programs, which include Hack.Diversity and Project Onramp, provide strong cohort training, mentorship and networking opportunities in addition to paid internships but currently operate at small scale, providing internships to just 102 students in 2019.

Report Highlights: Recommendations

I. CONTINUE TO BUILD OUT SYSTEMS AND CAPACITY ACROSS SECTORS—IN MIDDLE AND HIGH SCHOOLS, HIGHER EDUCATION INSTITUTIONS, NONPROFIT ORGANIZATIONS, AND INTERMEDIARIES—TO HELP STUDENTS UNDERSTAND THE PATHS TO SECURING A GOOD FIRST JOB ALIGNED WITH THEIR CAREER INTERESTS. Selection of a major needs to align with a student’s interests, aspirations, and passions. But students also need in-depth information and practical knowledge about the opportunities that various majors open up in order to make informed decisions. Studies show that most students are not taking career outcomes into account when selecting a postsecondary program, but a significant portion would if that information were provided in a timely and user-friendly way as part of the counseling process.¹⁵ New data tools are making such information more accessible and should be incorporated into career counseling programs at all levels. For example, College Scorecard data on earnings by major by college is now available on a web-based portal sponsored by the U.S. Department of Education. At the local level, NextGen Talent has created interactive labor market literacy reports on high-demand careers in the Boston area, along with an online directory of high-value technical and professional postsecondary programs. NextGen Talent has also created interactive reports on career outcomes by major to help college counselors and students in choosing a course of study. Complementing initiatives to make labor market information more transparent and accessible are efforts to strengthen students’ connections to careers with intentional exposure and work-based learning experiences. These include the state’s Innovation Pathways and Early College initiatives.

2. CREATE MORE OPPORTUNITIES FOR LIBERAL ARTS MAJORS TO ACQUIRE AND DEMONSTRATE CAREER-RELEVANT SKILLS, SO THAT THEY CAN SUCCESSFULLY COMPETE FOR INTERNSHIPS AND BA-LEVEL EMPLOYMENT AFTER COLLEGE.

Employer internship postings point to a set of high-demand skills, many of which can be learned in the context of any major. Broadly applicable professional skills such as business communications, problem-solving, research, and teamwork can be integrated into most courses. High demand technical skills such as Excel and other office applications, marketing and social media, customer service, sales, and data analysis skills can be taught in the context of existing courses or through new career development offerings. Capstone projects that have real-world applications offer one way to integrate professional skills development into academic coursework. Engaging employers in the design, coaching, and evaluation of these projects is a particularly effective way to ensure career relevance.

3. EXPLORE STRATEGIES TO EFFICIENTLY SCALE CAREER COACHING AND INTERNSHIP/JOB PLACEMENT SERVICES TO BOSTON’S COLLEGE STUDENTS FROM LOW-INCOME BACKGROUNDS, INCLUDING THOSE SERVED BY COLLEGE SUCCESS ORGANIZATIONS THAT DO NOT PROVIDE THIS COMPONENT. Several college success organizations, including OneGoal and the postsecondary support teams of charter school organizations, expressed interest in more intensive career coaching and internship/job placement services for their college students than they are currently able to provide. It would appear costly and inefficient to create within each of these organizations the specialized capacity needed to provide internship/job placement services on a trusted-supplier basis with employers, compared to a more centralized resource. A centralized process would also be a more effective way to engage employers with limited bandwidth to respond to multiple partnership requests. One possibility for creating a centralized career-coaching and placement

service would be to expand efforts like Bottom Line’s Career Connections program—now meeting approximately 40% of projected need—to meet the full need. Alternatively, a new intermediary vehicle could be established to provide similar services to meet the remaining need.

- 4. MOBILIZE CORPORATE LEADERS AND INDUSTRY ASSOCIATIONS TO CREATE MORE INTERNSHIP PROGRAMS THAT SPECIFICALLY RECRUIT STUDENTS OF COLOR AND STUDENTS FROM LOW-INCOME BACKGROUNDS AS A MEANS TO REDRESS INEQUITIES IN EMPLOYMENT.** Targeted efforts to aggregate employer demand and provide internships for low-income students and students of color—such as Hack.Diversity or Project Onramp—provide models for other industry groups to follow. With a growing number of corporations committing to affirmative steps to combat systemic racism in response to the movement for racial justice now sweeping the nation, the time seems ripe to take bold action to create more opportunities in Greater Boston’s growth industries for Boston’s low-income students and students of color.
- 5. EXPAND PARTICIPATION OF STUDENTS FROM LOW-INCOME BACKGROUNDS AND STUDENTS OF COLOR IN EXISTING LARGE-SCALE INTERNSHIP PROGRAMS.** Strengthening the talent development pipeline between the Massachusetts Life Science Center, Clean Energy Center, and Technology Collaborative industry initiatives and UMass Boston and other local state universities serving a large portion of Boston students is one means to increase access to these internships. Lessons drawn from the successful partnership between the Massachusetts Life Sciences Center and both UMass Amherst and UMass Lowell could help guide that process. Formal recruiting partnerships with college success organizations or with workforce intermediaries, to fill a certain number of placements reserved for low-income students and students of color, would be another option.

- 6. SUPPORT DEVELOPMENT OF VARIED WORK-BASED LEARNING MODELS TO ADDRESS THE NEEDS OF COMMUTER STUDENTS FROM LOW-INCOME BACKGROUNDS.** In recent years, UMass Boston has served over 25% of four-year college enrollees from Boston’s John D. O’Bryant School of Mathematics and Science and non-exam high schools—far more than any other higher education institution. The vast majority are commuter students working full- or part-time jobs to meet living expenses. Creating internship and other work-based learning opportunities for commuter students juggling school, work, and family obligations can be particularly challenging, but also particularly important. The newly launched PACE program is an innovative model worth tracking. Co-operative education, which is currently offered mainly at Northeastern University and Wentworth Institute of Technology, may be another option worth piloting at UMass Boston and elsewhere. Co-op placements would enable students to meet their financial needs while engaging in career-relevant work experiences. In a similar vein, helping commuter students who need to work to support themselves secure part-time jobs with better alignment to their career-goals may be another promising option.

I.

Description of Data Sources

This study drew upon several new data sources to determine the extent to which graduates from a Boston district or charter high school serving predominantly low-income students of color are transitioning into a good first job after earning a bachelor's degree. These sources provided three complementary metrics for evaluating the quality of employment the year after graduating from college—starting salary and yearly earnings, the education requirements of the job obtained, and the relationship of the job to a graduate's career goals. The study also leveraged these data sources to examine the extent to which field of study and internship participation are associated with first-destination job outcomes. While none of these data sources alone was sufficient to answer all of our research questions directly, as each has inherent limitations, combining the insights of each allows us to better understand the employment outcomes of low-income Boston students after graduating from college and key factors influencing those outcomes. These data sources are summarized below. (For a more detailed description of these data sources, *see Appendix 2.*)

■ Sample of Boston low-income graduates and their employment outcomes

Bottom Line, a nonprofit organization that delivers college access and success services to students from low-income backgrounds attending 18 area colleges, provided data on the outcomes of its graduates.¹⁶ Specifically, it provided student-level data for 248 Boston students who completed their degree in 2018 and answered a survey administered six to eight months postgraduation from college.¹⁷ All of the students in the sample are from low-income backgrounds, defined as having family income below 200% of the federal poverty line, and 98% are students of color.¹⁸ This data set provided detailed information on a group that is fully representative

of the student population that is the focus of this study. Bottom Line also provided trend data on the career outcomes from 2015 to 2018 for a combined cohort of Boston and Worcester graduates.¹⁹ In addition to serving students from the Boston area, Bottom Line also serves a smaller cohort of Worcester area students. Worcester area students comprised 19% of its 2018 graduating class.

■ Earnings of low-income graduates by major

College Scorecard, published by the U.S. Department of Education, provides aggregate earnings data for new graduates of individual public and private colleges and universities by major.²⁰ The College Scorecard earnings data is based on a sample cohort of students who received federal financial aid, making it a good match for approximating the public college earnings outcomes of low-income Boston students.²¹ As it was not possible to disaggregate results for Boston students attending these institutions, we used College Scorecard data for graduates of seven public universities that serve a large proportion of Boston's first-generation, low-income students as a proxy measure for the employment outcomes of Boston students.²²

■ Social profile data on first job outcomes and internship participation

Burning Glass provided social media profile data posted on career-focused platforms such as LinkedIn and Facebook by recent graduates of the seven public universities included in the study. This data provided information on the educational requirements (i.e., BA-level or not) of the first jobs for graduates of these institutions as well as the internship participation of these students while in college. The social profile data also included information on a student's major, which enabled

analyses of outcomes by field of study. For select analyses, we were able to break out the results for graduates of University of Massachusetts Boston, the four-year higher education institution with the highest concentration of graduates of Boston public high schools and with a general student population that most closely reflects the demographics of Boston public school graduates.²³ For other analyses, we combined the results of graduates from the seven colleges to achieve sufficient sample size to examine the connections between major, internship participation, and career outcomes.

■ **Four-year college enrollment and completion data for Boston Public School graduates**

National Student Clearinghouse data, provided by the Boston Public Schools (BPS), was matched with BPS student data to create a longitudinal file to analyze four-year college enrollments and completions of graduates from BPS high schools excluding Boston Latin and Boston Latin Academy.

Taken together, these data sources paint a more complete picture of the college-to-career transition outcomes of Boston students. The findings on labor market outcomes by college major and internship participation can inform strategies for boosting the earnings and career outcomes of students from low-income backgrounds, many of whom are the first in their family to attend college.

II. Quantitative Analysis

First-Year Earnings

FIRST-YEAR EARNINGS OF BOSTON GRADUATES FROM LOW-INCOME BACKGROUNDS COMPARED TO ALL GRADUATES

The study team used data supplied by Bottom Line to compare the average first-year salaries of low-income Boston-area graduates to the average starting salaries of all four-year college graduates in the New England region.

The average starting salary of Bottom Line's 2018 graduates working full time was \$44,849, 20% lower than the average starting salary of all New England college graduates working full time—\$55,624.²⁴

FIRST-YEAR EARNINGS BY FIELD OF STUDY

Given the limited sample size of the Bottom Line data set, we turned to the College Scorecard—a new data set released in the fall of 2019 by the U.S. Department of Education—to analyze the earnings differentials across college majors. The College Scorecard data includes first-year earnings of college graduates by field of study and postsecondary institution. The earnings data is based on a combined two-year cohort of students who graduated from college in 2014–15 and 2015–16, with earnings reported for calendar years 2016 and 2017, respectively. The earnings are then inflation-adjusted to 2018 dollars. The earnings data is restricted to graduates who were eligible for federal financial loans or grants during any time that they were enrolled in college, enhancing the value of using this data source as a proxy measure for the employment outcomes of low-income Boston students.²⁵

We examined the earnings outcome data by field of study for each of the seven public universities in the area most attended by Boston students. We found that

the differences between these universities in earnings for a given major were small (e.g., psychology majors at Framingham State compared to psychology majors at Bridgewater State). However, there were large differences in median earnings across majors at the same institution. Based on this analysis, we decided to aggregate the earnings data from the seven colleges to provide a more robust sample to examine median earnings by broad major. (See **Figure 2**.)

Nursing, engineering, and computer science majors had the highest annual earnings following graduation, while arts, humanities, psychology, education, and social science majors had the lowest earnings. Average median salaries ranged from a high of \$66,200 for nursing majors to a low of \$27,000 for visual and performing arts majors. In general, majors that emphasize quantitative skills and occupational/technical specific skills commanded higher-than-average salaries. The exceptions to this are natural science majors, who earned a median salary of \$35,000 compared to \$42,000 for all graduates. The low first-year salaries of natural science majors, which is the case nationally as well as in the Boston area labor market, likely reflects employer preference for graduate-degree holders for the better paying jobs in the field.²⁶

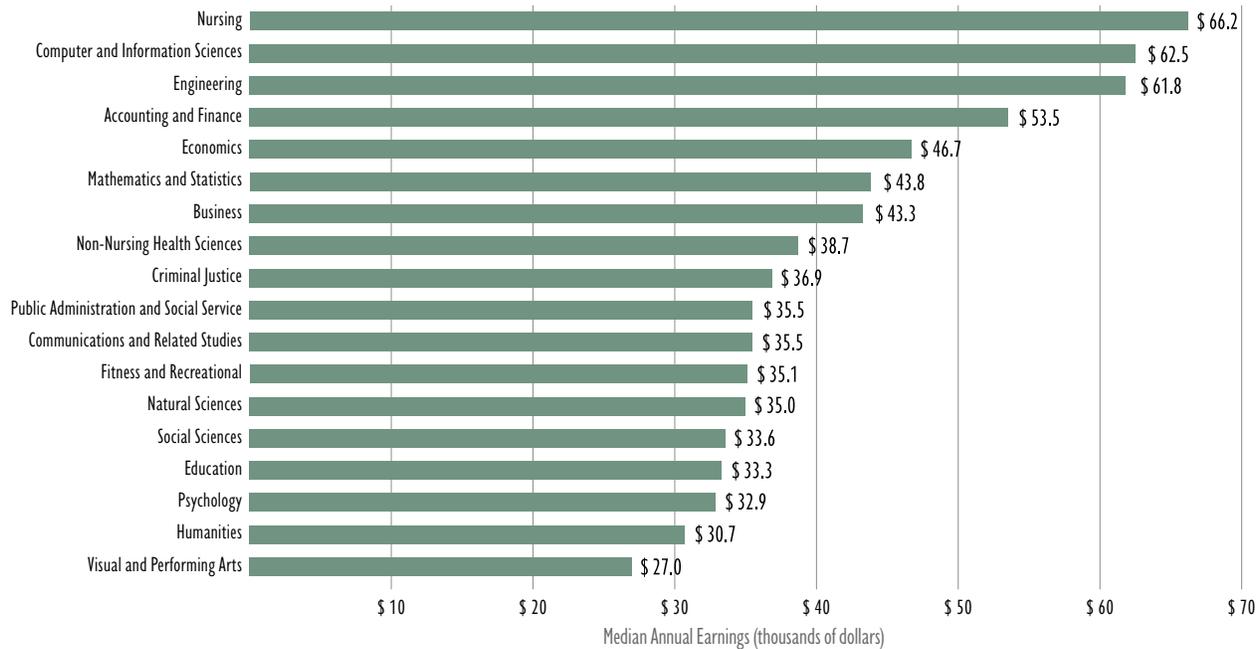
BPS GRADUATES IN HIGHER- AND LOWER-EARNING FIELDS OF STUDY

The study team next examined the field of study of BPS students who graduated from one of these seven public colleges to determine how represented BPS graduates were among the higher-paying and lower-paying majors. The sample used for this analysis consisted of BPS students who graduated from one of the district's non-exam high schools—which serve the vast majority of the district's low-income potential college-goers—between 2011 and 2013. The sample also included students from the John D. O'Bryant School of

FIGURE 2

Median Annual Earnings by Broad Major, Seven Public Colleges

Inflation adjusted to 2018 dollars



Note: Earnings are based on the 2016 and 2017 calendar years 11,408 graduates from the 2014–15 and 2015–16 academic years.

Source: Boston PIC Analysis of US College Scorecard Data ²⁷

Mathematics and Science—an exam school that serves a significantly higher proportion of Black and Latinx students and low-income students than Boston Latin School and Boston Latin Academy, the two Boston exam schools excluded from the sample.²⁸

Specifically, we compared the fields of study of BPS graduates to those selected by all graduates of these colleges. The results are shown in **Table 1**. BPS graduates are underrepresented in two of the highest-earning fields of study—nursing and engineering. For example, while 6% of all graduates earned degrees in engineering, the share of BPS graduates who did so was only half that, at 3%. However, BPS graduates were significantly more likely to earn business degrees, which are associated with first-year earnings slightly above the median. A slightly higher proportion of BPS graduates majored in economics and math, both of which earn above the median. Looking at first-year earnings below the overall average, BPS graduates were more likely to major in criminal justice, psychology, and other social sciences.

We also overlaid median earnings on the fields of study selected by BPS graduates at the seven universities. As shown in **Figure 3**, less than 5% of BPS graduates majored in any one of the four highest paying fields of study. The green bars in the chart indicate the median earnings of a given field, while the blue line shows the percentage of BPS graduates who earned a degree in that field. The largest field of study for BPS graduates—business—paid a median of \$43,000, just above the median earnings of \$42,013 for all graduates. The second largest field of study—psychology—was the second lowest-earning major, at \$32,900. The third largest field of study—criminal justice—was also below the average with earnings of \$36,900.

The low percentage of students completing computer and information sciences degrees is not specific to Boston graduates. In fact, BPS graduates are graduating with computer and information science degrees at the same rate—4%—as other students attending the seven public colleges, suggesting that this is a more general trend. It is also a potential

TABLE 1

Distribution of Majors of BPS Graduates Compared to All Graduates of the Seven Public Colleges

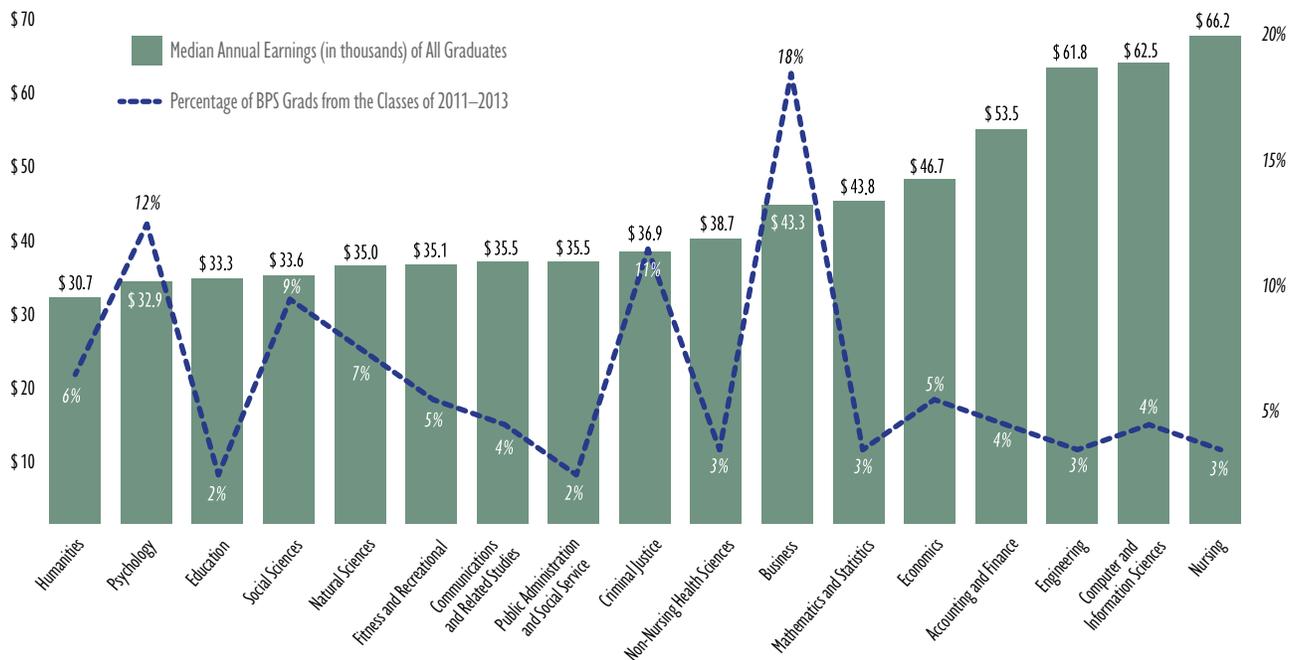
Field of Study	All Graduates (N =34,267)	BPS non-exam and O'Bryant Graduates (N = 423)	Field of Study	All Graduates (N =34,267)	BPS non-exam and O'Bryant Graduates (N = 423)
Accounting and Finance	5%	4%	Humanities	9%	6%
Business	13%	18%	Mathematics and Statistics	2%	3%
Communications and Related Studies	4%	4%	Natural Sciences	8%	6%
Computer & Information Sciences	4%	4%	Non-Nursing Health Sciences	4%	3%
Criminal Justice	4%	10%	Nursing	6%	3%
Economics, General	3%	5%	Psychology	9%	11%
Education	4%	2%	Public Administration and Social Service	1%	2%
Engineering	6%	3%	Social Sciences	7%	9%
Fitness and Recreational	2%	5%	Visual and Performing Arts	3%	1%

Notes: Data on all graduates comes from IPEDs completion data for 2014 and 2015 graduates from College Scorecard data file. From the BPS Classes of 2011 to 2013, there were 423 students from non-exam high schools and the John D. O'Bryant School of Mathematics and Science who completed a four-year degree at these seven public colleges.

Sources: U.S. College Scorecard and Boston Private Industry Council analysis of National Student Clearinghouse data.

FIGURE 3

Earnings by Field of Study & Percentage Distribution of College Grads



Note: The percentage shares of degrees by field of study are for 423 BPS graduates from the Classes of 2011 to 2013 who earned a degree at one of these seven colleges. This analysis excludes Boston Latin and Boston Latin Academy. Earnings are for college graduates eligible for federal loans and grants while in college.

Source: Boston PIC analysis of NSC and Burning Glass Technologies analysis of U.S. College Scorecard Data.

CRIMINAL JUSTICE: AN EXCEPTION TO THE BA EMPLOYMENT BENEFIT?

The low rate of attainment of BA-level jobs among criminal justice majors found in our analysis of social profile data (44%) is consistent with the New York Federal Reserve and the Burning Glass-Strada studies, which also found low rates of BA-level jobs among criminal justice majors—37% and 35%, respectively. These low rates could reflect the interest of many criminal justice majors in obtaining well-paying public safety jobs like police or correction officer, which do not require a BA degree for entry. To see whether criminal justice study paid off in such first-job placements, we looked at the non-BA jobs held by criminal justice majors in the year following graduation. We found that only 6% were employed as police officers, fire fighters, or correction officers. Another 26% were in non-BA level public safety related positions like security guards. It is still undetermined whether these lower-level security positions might serve as stepping stones to better-paying public safety positions. We also looked at the types of jobs attained by the 44% of criminal justice students who secured BA-level employment. Twenty percent (20%) were employed in a law or public safety job related to their major, such as security analyst or paralegal. The remainder held jobs across a wide range of career areas, including business, sales, finance, and community and social service.

concern, given the high demand for these skills in the Boston economy. An analysis of degree requirements of entry-level professional positions posted by Boston employers found that 23% of these postings asked for computer and information science degrees. This was the third most requested major for employers after business and accounting degrees.²⁹

We also compared the fields of study of BPS college graduates from the seven public universities to the full set of BPS students from the same high school classes who graduated from any college, private or public. There was a higher share of criminal justice and business majors among the graduates of the seven public universities, but otherwise the distribution of majors was similar (see **Appendix 3**).

Education Requirements of First Jobs

Earnings is one metric that can be used to measure the quality of first-year employment outcomes of college graduates. Attainment of a job commensurate with

the graduate's credentials is another. Recent studies of first-year employment outcomes by Burning Glass-Strada Institute for the Future of Work and the New York Federal Reserve use attainment of a job requiring a bachelor's degree as the measure of a good first job outcome.³⁰ Both studies classify four-year college graduates working in a job that typically requires less than a bachelor's degree as underemployed. Use of this metric is further bolstered by a Burning Glass-Strada finding that recent college graduates who secure a BA-level job are likely to earn 27% more than underemployed graduates and that this wage differential is likely to compound year over year because underemployed graduates are at greater risk of remaining in lower paying jobs.

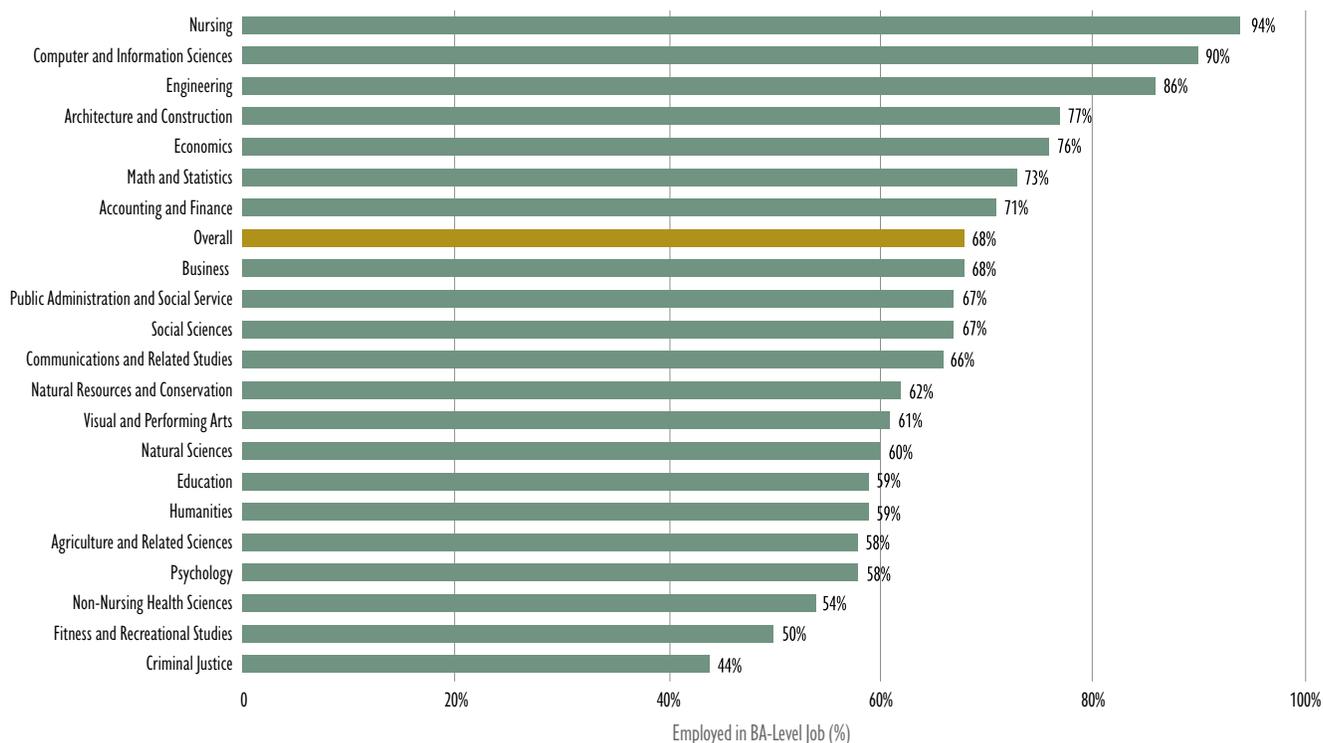
To explore the extent to which public university graduates are experiencing underemployment, we tapped a new data source obtained by Burning Glass: social media profiles posted by students who graduated between 2014 and 2018 from the same seven public universities used in the College Scorecard earnings analysis. This data was used to answer the following questions:

- *What is the overall rate of achievement of BA-level employment the year following graduation for these graduates?*
- *How is the choice of major related to attainment of a BA-level job?*
- *How does participation in an internship experience influence attainment of a BA-level job and does that influence vary by major?*

Unlike the College Scorecard data, here we were not able to restrict the analysis to lower-income students receiving financial aid. As such, the actual percentage of low-income Boston students achieving a BA-level job may differ to some extent from the findings for all graduates presented here. Similar to the national studies cited earlier, we defined a BA-level job as a job that typically requires a bachelor's degree, though we broadened the definition to include a small subset of Boston-area jobs with higher than-average earnings in which a significant portion required a bachelor's degree. (See **Appendix 4**, Methodology, for definition of bachelor-level occupation used in this study.)

FIGURE 4

Percent Employed in a BA-Level Job by Field of Study



Source: Burning Glass Technologies analysis of Social Profile Data, 2014-2018

Overall, 68% of graduates from the public universities included in the study were employed in a bachelor-level job within a year of graduation. There was wide variation by major, from a high of 90% for computer science majors to a low of 44% for criminal justice majors (Figure 4). This variation closely tracks the pattern we saw in the College Scorecard earnings data for graduates from these same colleges: The high-demand, occupational-focused majors of nursing, computer science, and engineering had the highest rates of securing a BA-level job. Graduates of majors in more traditional liberal arts and science fields, such as psychology, humanities, and the natural sciences, had lower-than-average rates of achieving a better-paying BA-level job. Students majoring in the two health-related degree programs of fitness and recreation studies and non-nursing health sciences also had lower-than-average rates of achieving a BA-level job. This likely reflects the need to pursue an advanced

degree to qualify for the better-paying jobs within these fields of study. For example, students majoring in exercise science need to earn an advanced degree to qualify for occupations such as occupational or physical therapists.

There was also variation in BA-level job attainment between colleges within the same major, though this variation was much smaller than the variation between majors (see Table 2). As expected, UMass Amherst—the most selective among the public universities in the study—had higher BA-level employment rates than the other universities for most majors. For example, 66% of UMass Amherst psychology majors were employed in a BA-level job, compared to 60% or less from the other six colleges. The pattern was similar for the natural science and social sciences majors, with UMass Amherst graduates achieving a 6 and 8 percentage-point higher rate of BA-level employment, respectively, than the next highest school in these majors.

TABLE 2

Employment in BA-Level Job for Graduates of Seven Public Universities 2017–2018, by Major and Institution

Major	School	Employed in BA-Level Job
Accounting and Finance	University of Massachusetts-Amherst	77%
	University of Massachusetts-Lowell	74%
	University of Massachusetts-Dartmouth	71%
	University of Massachusetts-Boston	69%
	Bridgewater State University	66%
	Salem State University	63%
Business	University of Massachusetts-Amherst	72%
	University of Massachusetts-Lowell	69%
	University of Massachusetts-Boston	68%
	University of Massachusetts-Dartmouth	66%
	Framingham State University	64%
	Salem State University	61%
	Bridgewater State University	59%
Communications and Related Studies	University of Massachusetts-Amherst	71%
	University of Massachusetts-Lowell	65%
	Framingham State University	61%
	Bridgewater State University	60%
	Salem State University	60%
	University of Massachusetts-Boston	60%
Computer and Information Sciences	University of Massachusetts-Amherst	92%
	University of Massachusetts-Lowell	91%
	Salem State University	89%
	University of Massachusetts-Dartmouth	88%
	Bridgewater State University	87%
	University of Massachusetts-Boston	86%
	Framingham State University	86%
Criminal Justice	Framingham State University	51%
	Bridgewater State University	47%
	Salem State University	44%
	University of Massachusetts-Lowell	42%
	University of Massachusetts-Boston	38%
Education	Bridgewater State University	64%
	University of Massachusetts-Amherst	61%
	Salem State University	46%
Engineering	University of Massachusetts-Amherst	91%
	University of Massachusetts-Dartmouth	84%
	University of Massachusetts-Lowell	83%
Fitness and Recreational Studies	University of Massachusetts-Amherst	51%
	Salem State University	49%
	Bridgewater State University	48%

Major	School	Employed in BA-Level Job
Humanities	University of Massachusetts-Amherst	60%
	Bridgewater State University	60%
	University of Massachusetts-Boston	59%
	University of Massachusetts-Dartmouth	58%
	University of Massachusetts-Lowell	58%
	Framingham State University	58%
	Salem State University	50%
Natural Sciences	University of Massachusetts-Amherst	67%
	University of Massachusetts-Boston	61%
	Bridgewater State University	58%
	University of Massachusetts-Dartmouth	54%
	University of Massachusetts-Lowell	51%
	Salem State University	47%
Nursing	University of Massachusetts-Amherst	97%
	University of Massachusetts-Boston	95%
	University of Massachusetts-Dartmouth	93%
	Salem State University	92%
	University of Massachusetts-Lowell	88%
Psychology	University of Massachusetts-Amherst	66%
	University of Massachusetts-Dartmouth	60%
	University of Massachusetts-Lowell	56%
	Framingham State University	56%
	University of Massachusetts-Boston	55%
	Bridgewater State University	52%
	Salem State University	48%
Social Sciences	University of Massachusetts-Amherst	73%
	University of Massachusetts-Boston	65%
	University of Massachusetts-Lowell	64%
	Salem State University	61%
	University of Massachusetts-Dartmouth	61%
	Framingham State University	59%
	Bridgewater State University	55%
Visual and Performing Arts	University of Massachusetts-Lowell	73%
	University of Massachusetts-Dartmouth	72%
	Bridgewater State University	57%
	Salem State University	50%
	University of Massachusetts-Amherst	49%

Note: Results by major are displayed for institutions with at least 50 graduates in that major and for majors in which at least three institutions met that threshold. The “Non-Nursing Health Sciences” major was excluded because the individual programs comprising this major are too varied across institutions to support comparison.

Source: Burning Glass Technologies analysis of Social Profile Data, 2014-2018.

IS BOSTON DIFFERENT IN BA-LEVEL JOB ATTAINMENT?

Overall, just over two thirds of graduates (68%) appear to be landing BA-level jobs. This rate is somewhat higher than the rates found in the Burning Glass-Strada study (57%) and the New York Federal Reserve study (54%–59%). Several factors could account for the higher rate here.

One possibility is selection bias resulting from the use of social profile data. In contrast to résumés—the source used in the Burning Glass-Strada Study—which generally list all employment experiences to avoid showing gaps in employment history, social profiles may present a more selective set of work experiences to highlight the individual’s marketable skills. Similarly, social profile sites are generally geared toward professional, white-collar employment. Graduates who have difficulty securing white collar employment may be less likely to complete or update their social profiles until they achieve such a position. In our sample, 21% of graduates not continuing their education had no work experience listed on their profile the year following graduation. Yet approximately half (52%) of these graduates had a work experience listed for a subsequent year, suggesting that they may have intentionally omitted non-professional first-year employment from their profiles. The New York Federal Reserve study used government survey data, which is less prone to selective reporting of employment outcomes.

Another factor that could explain a higher rate of achievement is the strength of Boston’s economy and its tighter labor market compared to the rest of the nation between 2015 and 2019, the period used to measure first job outcomes of graduates in this study. In December 2015, the unemployment rate for the Boston metro area was 3.5%, compared to 5% nationally. By December 2019, the Boston unemployment rate had dropped to 2%, compared to 3.5% nationally.³¹ Finally, a third factor that may explain the higher rate of achievement is the college sample used for this analysis. Students from the two most selective public universities in the state, UMass Amherst and UMass Lowell, accounted for 57% of the sample group, potentially skewing the sample toward higher-achieving students than the national samples used in other studies.

However, the differences between colleges were minimal for some majors, most notably the humanities, where six of the seven institutions were within 2 percentage points of each other. And in one major—visual and performing arts—graduates from other colleges had substantially better first-year employment outcomes than their counterparts from UMass Amherst. Seventy-two percent (72%) of UMass Lowell and UMass Dartmouth visual and performing arts majors were employed in BA-level job compared to only 49% of UMass Amherst graduates. The high rates of BA-level employment among UMass Lowell and UMass Dartmouth graduates may reflect the commercial focus (e.g., graphic and web design) of programs of study within the visual and performing arts departments at those schools compared to a focus on studio arts at UMass Amherst.

Internship Experience and BA-Level Job Attainment

Attainment of BA-level first jobs in the social profile data was consistent with both the College Scorecard data and the national studies regarding relative outcomes by major. But unlike other data sources, social profiles also allow us to examine the potential influence of internship experiences on first-year employment outcomes.

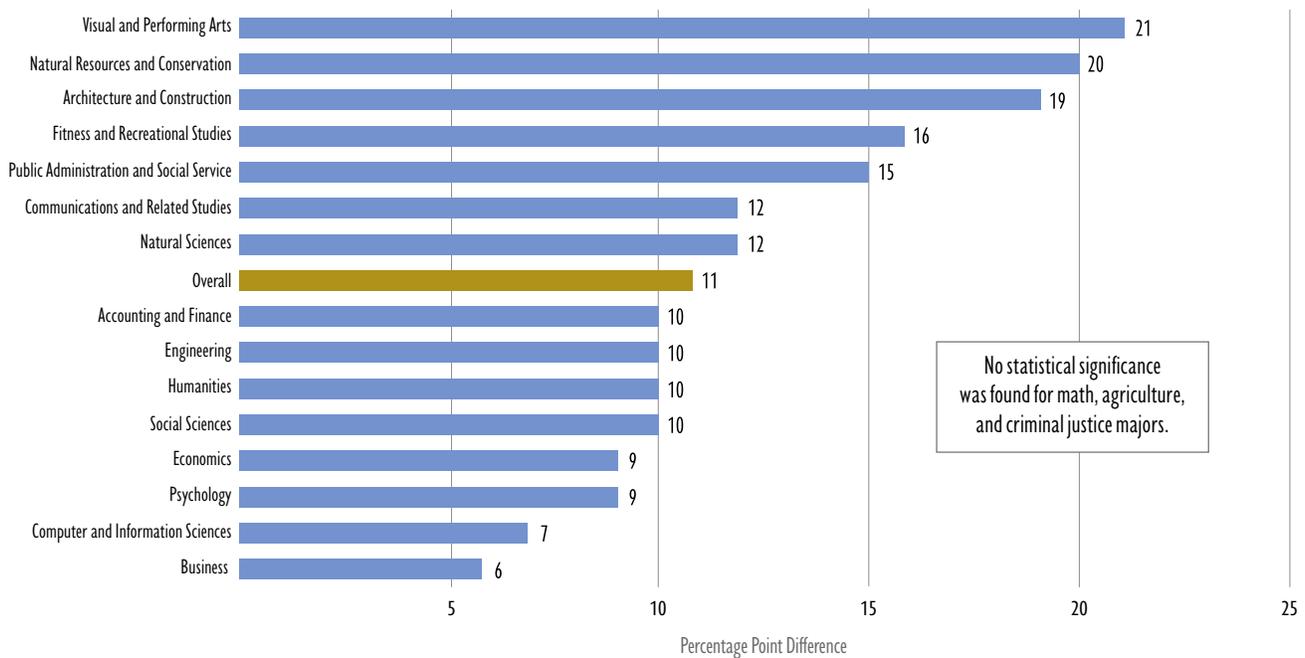
Overall, students who completed at least one internship had a significantly higher rate of achieving a BA-level job—75%, compared to 63% of students who had no internship.³²

Most majors showed a 10 to 12 percentage point benefit from internship experience, ranging from 22 points for visual and performance arts majors to six points for business majors. (See **Figure 5**.) There was no significant difference in outcomes based on internship participation for math, agriculture, non-nursing health, and criminal justice majors.

The significance of internship experiences is particularly noteworthy for liberal arts and natural science majors who have a more difficult time securing BA-level jobs than those pursuing more professionally oriented majors. For example, natural science majors who participated in an internship had a 69% placement

FIGURE 5

Increase in BA-level Job Attainment for Graduates with Internship Experience



Source: Burning Glass Technologies analysis of Social Profile Data, 2014-2018

rate in a BA-level job, compared to a 57% placement rate for those who did not. Psychology majors who participated in an internship had a 65% placement rate in a BA-level job, compared to 56% for their peers without an internship. Similarly, 66% of humanities majors with internship experiences achieved a BA-level job, compared to 56% who did not.

Because we were unable to distinguish between paid and unpaid internships, these results may understate the advantages associated with paid internships and overstate those associated with unpaid internships. Studies and surveys sponsored by the National Association of Colleges and Employers (NACE) have generally found a positive impact for paid internships on employment outcomes but no impact for unpaid internship experiences.³³ For example, the NACE 2019 Student Survey found that graduating seniors with paid internships received 50% more job offers than students with either unpaid or no internship experiences; they were also much more likely to have accepted a job offer by the time of the survey.³⁴ It is reasonable to suspect that paid internships in our

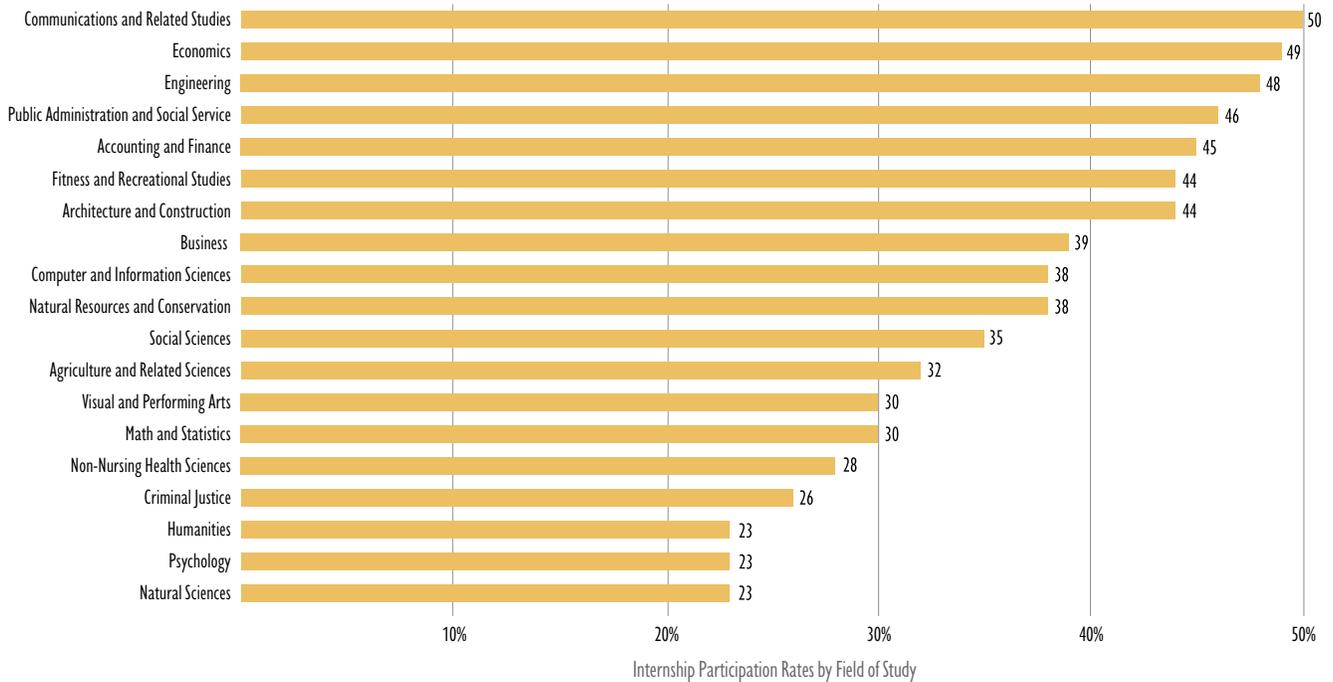
social profile sample may be even more strongly associated with post-graduation BA-level employment than we show, especially in fields with a high proportion of unpaid internships, as the strength of the association we observe is likely attenuated by the inclusion of unpaid internships in these data.

Next, we examined the extent to which students with different majors were accessing internships. We found significant variation in internship participation by major—from a high of 50% by communications majors to a low of 23% for humanities, psychology, and natural sciences majors (see **Figure 6**).

The high rate of internship participation by communications majors reflects the large number of internships in marketing and public relations advertised in job postings, second only to information technology and math. (See **Appendix 4**) It may also reflect practices in communications departments facilitating and promoting internship participation as a way to gain professional experience and industry contacts.

FIGURE 6

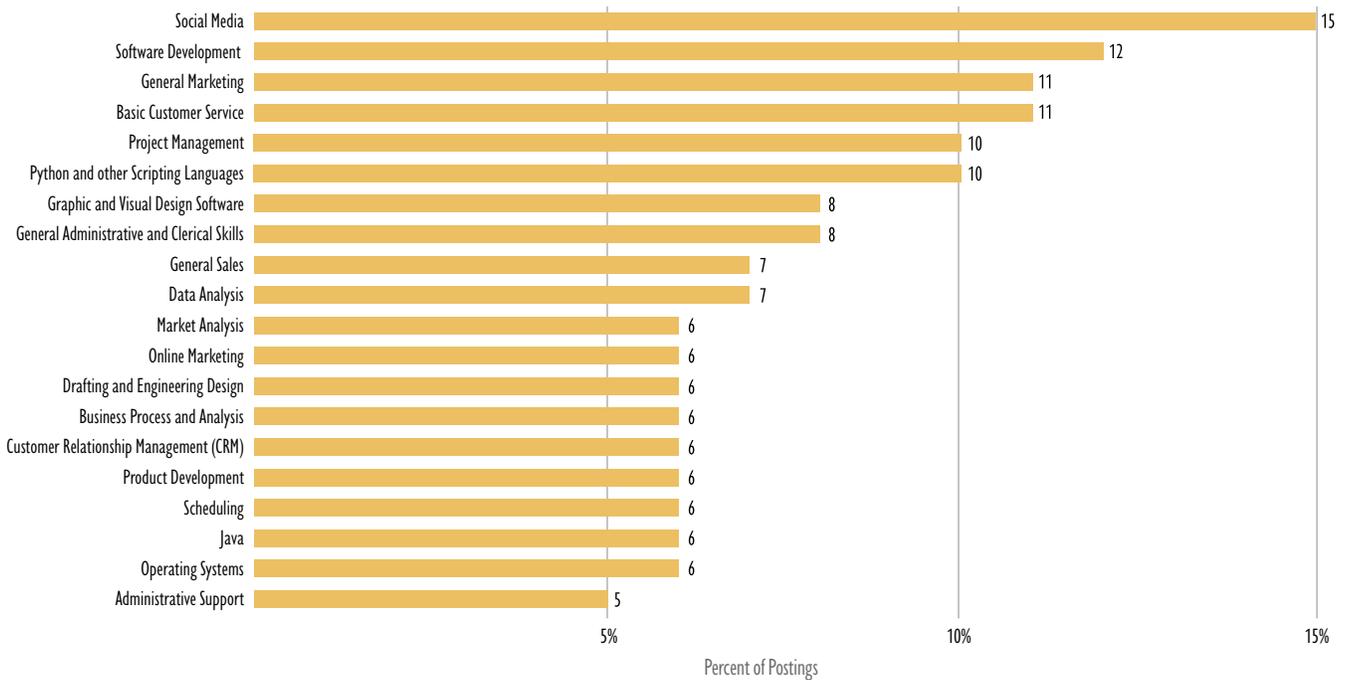
Rate of Internship Participation, by Major



Source: Burning Glass Technologies analysis of Social Profile Data, 2014-2018.

FIGURE 7

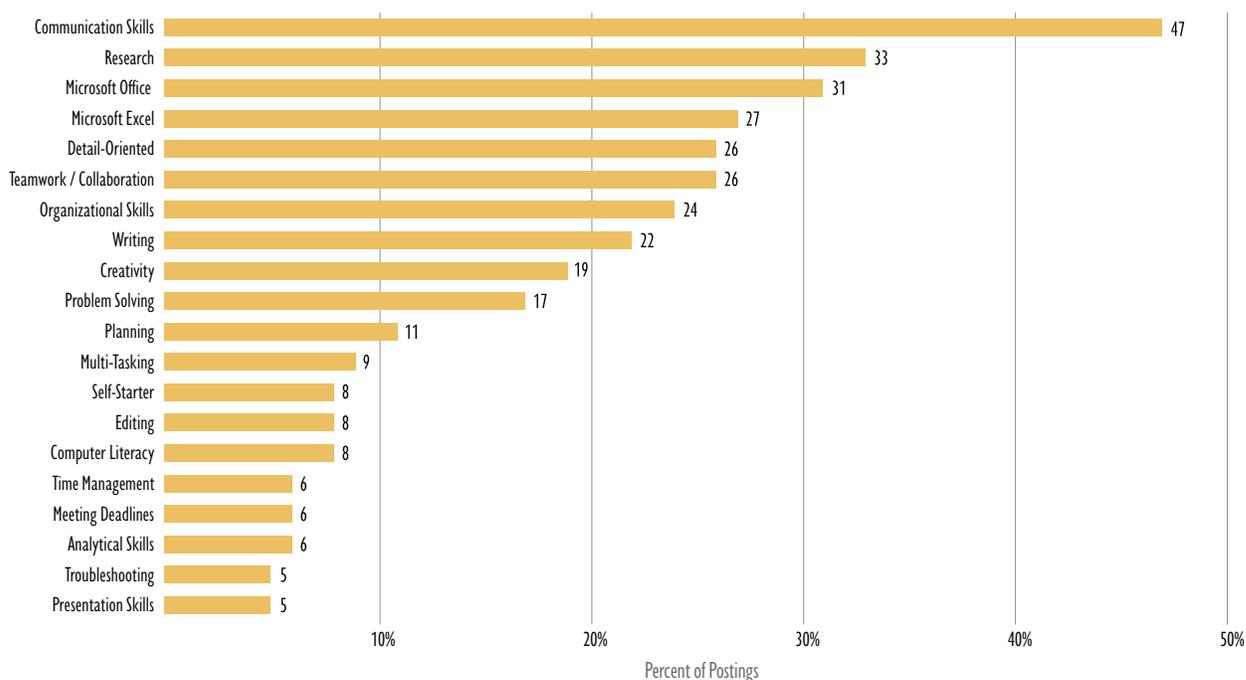
Top Specialized Skills in Internship Postings, Boston Metro Area, 2019



Source: Burning Glass Technologies analysis of jobs postings from January-December 2019 for Boston Metro Area.

FIGURE 8

Top Foundational Skills Requested in Internship Postings, Boston Metro Area, 2019



Source: Burning Glass Technologies analysis of jobs postings from January-December 2019 for Boston Metro Area.

Drilling down further, our analysis of internship postings shows some of the top specialized skills requested in job postings were social media, basic customer service, general marketing, and project management—skills that fit well with communications studies (Figure 7). But these are skills that students majoring in liberal arts more generally might also have or could easily acquire, making them viable candidates for internship positions. Providing more explicit vehicles for students majoring in the liberal arts to acquire and demonstrate career-relevant skills could help them qualify for and benefit from internships that could put them in a better position to land a BA-level job after graduation. Similarly, the top foundational skills that employers look for in interns—research, Microsoft Office software suite, writing, teamwork, computer literacy, problem solving—can be acquired in a wide range of college majors or with minimal supplements of basic office skills (Figure 8).

Finally, we analyzed internship participation by postsecondary institution (see Table 3). For this analysis, the sample size was sufficient to use the two

most recent years (2017 and 2018). Overall, 40% of graduates from the seven public universities had at least one internship. But internship participation varied widely by institution: 53% of UMass Amherst graduates had internship experience, the highest rate, with UMass Dartmouth having the second-highest rate, at 37%. Students who attended UMass Boston and Salem State had the lowest rates, at 24% and 23%,

TABLE 3

Internship Participation by University

	Internship participation
OVERALL	40%
University of Massachusetts-Amherst	53%
Framingham State University	37%
University of Massachusetts-Dartmouth	37%
University of Massachusetts-Lowell	31%
Bridgewater State University	27%
University of Massachusetts-Boston	24%
Salem State University	23%

Burning Glass analysis of Social Profile Data for 2017 and 2018 Graduates

respectively. In other words, while more than half of all students at UMass Amherst had at least one internship, less than one quarter of UMass Boston students did so. Given the number of Boston high school students who enroll at UMass Boston, and the apparent benefits of internships in post-graduation job outcomes, strategies to increase participation in internships at UMass Boston could prove particularly beneficial for Boston high school graduates.

Relationship of First Job to Career Goals

In addition to earnings and BA-level job attainment, there is the question of alignment of first jobs with career goals. An effective postsecondary education, with appropriate supports, should not only get students satisfactory incomes from positions commensurate with their educational achievement but also put them on track toward their career goals. To examine this aspect of post-graduation outcomes for low-income Boston students, we once again turned to Bottom Line, the only data source that provides insight on the alignment of first jobs with students' career goals.

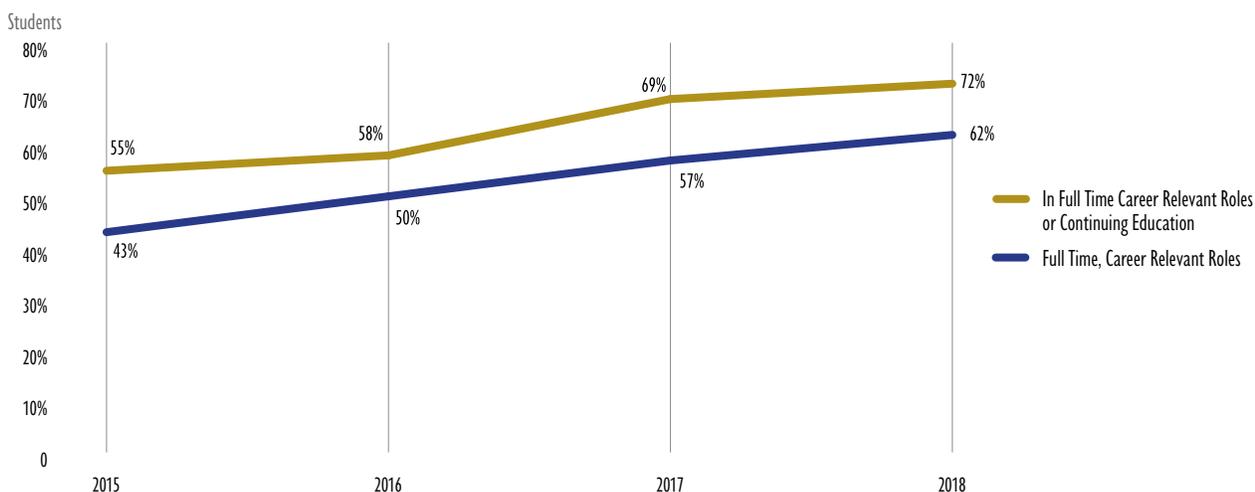
Since 2015, Bottom Line has tracked the post-graduation outcomes of its students from low-income backgrounds, using the following metrics as positive indicators:

- Securing a full-time career-relevant position (based on student or counselor rating of the position) within six to eight months of graduation.
- Continuing their education.

From 2015 to 2018, there was a steady increase in the percentage of Boston and Worcester Bottom Line graduates securing full-time employment in a position relevant to their career goals (**Figure 9**). In 2015, 43% of graduates were employed full time in a career-relevant position, with an additional 12% continuing their education. By 2018, the rate of career-relevant job attainment increased to 62% in career-relevant positions, with an additional 10% continuing their education; for Boston students, 60% were in career-relevant positions with 9% continuing their studies. The increase in students securing a full-time, career-relevant job coincides with an intensification of career-related services to Bottom Line students through the organization's Career Connections program. (For a detailed description, see **Appendix 6**.) This speaks to the value of support services helping Boston students navigate their way through college and into the workforce and suggest some strategies for strengthening connections between college students from low-income backgrounds and good first jobs.

FIGURE 9

Career Outcomes of Bottom Line College Graduates 2015–2018 Boston and Worcester Students



Source: Bottom Line

III.

Estimated Need and Existing Capacity to Connect Students to Internships and Good First Jobs

In this section of the report, the study team sought to answer the following questions:

- *What is the projected need for services to help low-income Boston students attending in-state, four-year colleges secure internships and career-track employment?*
- *What is the current and projected capacity of organizations providing internship and job placement services to meet the needs of low-income college students in order to close opportunity gaps?*
- *What are some promising strategies that could be scaled to improve access to internships and good first jobs for college graduates from Boston's public high schools?*

Projected Need for Services by 2023

In order to understand the potential demand for services that connect students from low-income backgrounds to internships and good first jobs, the study team estimated the number of graduates of Boston public high schools (i.e., BPS and charter schools) that will enroll in a Massachusetts four-year college in 2023. Our estimate includes all graduates of BPS non-exam and O'Bryant high schools, as well as all graduates of Commonwealth charter high schools located in Boston. These schools serve a very high proportion of low-income students, who would be most in need of these career services. The estimate excludes students attending out-of-state colleges based on the assumption that it would be cost-prohibitive to provide comprehensive career services to these students.

The year 2023 was selected because this is the year by which several recently created charter high schools will have graduated their first or second classes. By 2023, approximately 28 percent of Boston students entering a postsecondary program will be graduates of Commonwealth charter high schools. Due to their

higher four-year college enrollment rates, they will account for nearly one in every three high school graduates (32%) from Boston enrolling in four-year colleges, if current enrollment patterns continue through 2023.

To estimate the percent of students from BPS and charter high schools enrolling in four-year institutions by 2023, we used K–12 enrollment, cohort graduation rates, and college enrollment data from the Massachusetts Department of Elementary and Secondary Education (DESE).

- 1. PROJECTING THE NUMBER OF HIGH SCHOOL GRADUATES IN 2023:** We multiplied ninth grade enrollment levels from the 2019–20 school-year for BPS and each charter school by 2019 cohort graduation rates. Assuming no changes in cohort graduation rates, this yields a projected 3,663 high school graduates from BPS (excluding Boston Latin and Boston Latin Academy) and charter schools in Boston in 2023.
- 2. PROJECTING THE NUMBER OF FOUR-YEAR COLLEGE ENROLLEES IN 2023:** We used college enrollment data from DESE's "Graduates Attending Institutions of Higher Education" report to estimate the share of four-year college enrollees in 2023 based on the most recent college enrollment patterns of 2019 graduates from BPS and Boston's charter schools.³⁵ Of the projected 3,663 graduates, we estimated 2,353 graduates will enroll in a two- or four-year college in 2023, with 1,485 enrolling in four-year institutions, assuming that they enroll at four-year colleges at similar rates as the Class of 2019.
- 3. PROJECTING THE NUMBER OF FOUR-YEAR COLLEGE ENROLLEES AT MASSACHUSETTS INSTITUTIONS:** DESE's Graduates Attending Higher Institutions report does not disaggregate in-state vs. out-of-state private institutions. To estimate

the number attending in-state four-year public and private institutions, we relied on the share of BPS graduates from the Class of 2018 that were at in-state, four-year colleges and universities based on NSC records, and assumed that this share would remain constant through 2023 and be the same for charter school graduates.³⁶ The share attending an in-state, four-year college or university is 87%. Multiplying this share by the number of four-year college enrollees (1,485) yields an estimated number of 1,301 students who will need career services.

Table 4 below shows the breakdown of these calculations used to generate a potential need for career services in 2023.

TABLE 4
Estimated Need for Career Services in 2023

Capacity Analysis	Projected in 2023
Projected number of high school graduates	3,663
Projected number of 2- and 4-year college enrollees	2,353
Projected 4-year college enrollees from BPS and Commonwealth charter schools	1,485
Projected percentage attending a Massachusetts 4-year college or university	87%
Projected need for career services in 2023	1,301

Existing Capacity to Connect Students to Internships and Good First Jobs

The study team analyzed existing capacity to provide services connecting low-income college students to internships and good first jobs in Greater Boston through interviews with three different types of organizations: college success organizations, industry-aggregated internship programs, and university career services offices. The organizations that were interviewed include: Bottom Line, Excel CAPS program, Thrive Scholars (formerly SCS Noonan Scholars), OneGoal, Hack.Diversity, Project Onramp, Forest Foundation, Mass Life Science Center, Mass Clean Energy Center, Greater Boston Chamber of Commerce, UMass Boston, Salem State University, and Bridgewater State University.

In terms of current scale, we found:

- Multi-year, in-depth, and formal program services are currently being provided to approximately 520 students by Bottom Line and Thrive Scholars; any scaling of these services is dependent on additional resources.
- The industry-aggregated internship programs in Greater Boston that we interviewed—Hack.Diversity, Project Onramp, Forest Foundation, and the Greater Boston Chamber of Commerce Skills First Program—provided 122 internships in 2019 (there is overlap with the Bottom Line and Thrive Scholars service numbers since both are feeders into the industry programs). These programs planned to expand in future years. In addition, in 2019 the Massachusetts Life Sciences Center (MLSC), the Massachusetts Clean Energy Center (MCEC), and the Massachusetts Technology Collaborative (MTC) sponsored 1,326 internships statewide to residents of the Commonwealth or students attending colleges in the Commonwealth (these programs do not specifically target low-income students).
- The three university internship programs we interviewed estimated that approximately 2,610 students participated in internships across the three campuses in 2019. However, this number only reflects the internships the schools were able to track and may undercount internship placements supported by individual academic departments or secured by students through other sources.

GAP IN CAPACITY BY 2023

With estimated demand at 1,301 new students per year and current capacity to provide intensive, multi-year services at 520 new students per year, the estimated gap in service capacity is approximately 750 new students/year, requiring more than a doubling of existing capacity.³⁷

The programs that we interviewed have developed service delivery models aimed at addressing challenges that low-income students face in being able to access and participate in internships. Across the board, these organizations described similar challenges including:

- Financial dependence on a full-time or nearly full-time job, often in an entry-level position, presenting a difficult trade-off when students need to leave the job or reduce hours in order to accept an internship aligned with their field of study and professional goals, especially if the internship is unpaid;
- Not being able to access or afford transportation to an internship or good first job;
- Needing to live at home in order to reduce costs, limiting their time on campus and therefore awareness or ability to take advantage of career services;
- Limited professional networks and information about the importance of and how to access internship programs; and
- Limited career advising to inform the selection of a major and how that major connects to the student's interests, values, and the regional labor market.

There are common elements to the service delivery models within each of the three categories of organizations (college success, university career services, industry-aggregated):

COLLEGE SUCCESS ORGANIZATIONS

The most intensive and sustained service model is offered by the college success organizations Bottom Line and Thrive Scholars. These programs begin to work with students in high school and continue through college graduation and attainment of a first good job. At a high level, each of these programs employs a team responsible for working with students on preparing for and finding an internship and good first job and for building out committed relationships with employers that provide paid internships and good first jobs. The programs have a clear and measurable framework for career-ready skill attainment over each of the four years of college and intentionally build internships, mentorships, and network building into the program model. These programs have clear goals relative to internships and good first jobs and measure their progress toward these goals routinely.

INDUSTRY-AGGREGATED INTERNSHIP PROGRAMS

There are common elements to the Greater Boston industry-aggregated internship models as well. Programs such as Hack.Diversity and Project Onramp are organized by industry associations to mobilize members to provide internships to underrepresented populations through a shared program that is branded by the industry association. These programs range in duration from 10 weeks to eight months and generally include paid internships, programming that includes technical and professional skill building, and mentorship and network building with professionals in the industry, including in the C-suite. The industry programs are focused on low-income students and students of color, providing a strategy to diversify talent pools for the companies within that industry. For the most part, the industry relies on referrals of students from colleges, college success organizations, and other programs serving low-income and students of color. Some of the programs support industry partners in engaging in organizational change focused on diversity, equity, and inclusion. These programs also have established goals and metrics.

UNIVERSITY CAREER SERVICES AND INTERNSHIP OFFICES

The public universities serving large numbers of Boston graduates that we interviewed tap into various public and philanthropic sources to support their internship programs, including the Massachusetts Internship Incentive Program, the MLSC, MCEC, and MTC and private fundraising. The universities generally support academic programs that require internships and students who seek out internships and career services but lack the capacity to reach a significant share of all students on campus. Each of the universities is experimenting with approaches that expand the reach of the career services and internship offices, including first-year experience programs, internship and job posting portals, and remote and online connections between companies and students (especially after COVID-19).

Promising Practices That Could Be Scaled or Replicated

Several promising practices emerged from this research that suggest ways to serve a greater number of low-income students to increase access to and success in attaining internships and good first jobs.

INVESTING IN CAREER CONNECTIONS CAPACITY TO LEVERAGE COLLEGE SUCCESS ADVISING

Organizations like Bottom Line and Thrive Scholars have created Career Connections teams that leverage the work of the college success advisors and their trusted relationships with students. They have a framework that is intentional about skill-building over each of the four years of college. They provide access to mentors and network-building leading to internship and good first jobs. The Bottom Line data shared earlier in this paper demonstrates the promise of Career Connections services in improving the employment and earnings outcomes of their graduates.

EMPLOYER ENGAGEMENT

The Career Connections teams at Bottom Line and Thrive Scholars actively cultivate and nurture relationships with employers to prioritize hiring of their students into paid internships. These teams tap into larger corporate or industry-wide efforts to hire interns from underrepresented communities, but they also reach out to industries that align with the majors of the students in their programs. The staff on the teams have industry expertise and are able to provide coaching to college success advisors and to students in preparing for the hiring process and for success in the internship.

INDUSTRY LEADERSHIP IN MOBILIZING COMPANIES TO ENGAGE

Industry associations have played a critical role in the life sciences and technology industries to mobilize companies to provide internships, mentors, and support for adjacent programming specifically tied to building a more diverse talent pool for their industry. As noted earlier, the scale of industry-aggregated internship programs is small and most of the programs plan to cap the cohort size at 75 in order to ensure a high-quality learning community in any one geographic hub. This points to the need for more

industries to take the lead in growing and supporting internships among their companies in order to increase the number of internship opportunities for low-income students and students of color in Greater Boston that lead to good first jobs and upward mobility.

EMERGING INTERNSHIP CAPACITY AND OTHER WORK-BASED LEARNING MODELS AT PUBLIC UNIVERSITIES

In the spring of 2020, UMass Boston announced a new initiative—the Professional Apprenticeship Career Experience program (PACE). PACE will provide on-campus mentors and work experiences related to a student’s career interests in their first two years of college and that will transition into apprenticeships at businesses in the last two years of college. UMass Boston hopes to scale this to 750 students in the fifth year following the pilot in 2020. Bridgewater State University has set a goal of 1,000 paid or funded internships by 2025.

PARTNERSHIPS LEVERAGING UNIQUE STRENGTHS OF EACH INTERNSHIP MODEL

In many cases, the three different types of internship programs work together formally and informally, creating a nascent ecosystem to connect low-income college students to internships and good first jobs. The colleges and college success organizations serve a vital role as feeders into the industry-aggregated internship programs. Project Onramp is run by Life Science Cares in a formalized partnership with Bottom Line, which identifies, prepares, and supports first-generation college students or students from low-income backgrounds who are hired as interns by life sciences companies that participate in Project Onramp. Other Project Onramp partners include MassBio, the MassBioEd Foundation, Mass. Biomedical Initiatives, and the Massachusetts Life Sciences Center. Hack.Diversity similarly turns to these organizations and colleges, along with bootcamps and other non-traditional sources, to recruit and prepare low-income students of color to apply to their program. The colleges have worked with the Massachusetts Life Sciences Center and the Clean Energy Center to support and prepare students to apply through their internship portals, and among the “best practices” demonstrated by colleges, faculty actively advocate for students with employers.

Summary Snapshots: Career Connecting Capacity in Greater Boston

College Success Programs That Were Interviewed

Organization	Brief Description	Target Population	Current Scale	Future Plans
Bottom Line	Career Connections team works with college success advisors to connect students to internships and good first jobs; clear framework and curriculum across four years in college to prepare for career success.	Students from low-income backgrounds attending one of 18 local public and private four-year colleges.	2800–2900 annually; adding 550 new students each year; 500 in Greater Boston.	Looking at ways to leverage Career Connections team and model; doesn't anticipate adding students but is actively exploring development of lighter touch fee-for-service offerings to expand impact.
Thrive Scholars (formerly SCS Noonan Scholars)	National career coaching team works one on one with scholars beginning as high school juniors and continuing through college; includes career planning and development skills, internships, help in finding full-time job after graduation.	High achieving students of color who are first generation students with a GPA of 3.7 to 4.0 and an SAT score of 1100+.	116 total in Greater Boston; adding 30 new students/year in Greater Boston.	Grow nationally from 600 to 1800; grow in Boston as funding allows.
Excel Academy Charter High School CAPS Program	College success advising; clear framework for preparing for career over four years; no explicit career connections. Building out NextGen Talent to partner with high schools and college success organizations to develop labor market products that inform postsecondary choices.	Graduates of EACHS and graduates who attended Excel middle schools.	273 in total; adding 150 students/year.	Will continue to add 150 students each year.

Public Universities Serving Largest Numbers of BPS Graduates (2015–16) That Were Interviewed

College	Brief Description	Scale of Internships in 2018-19	Future Plans
UMass Boston	Provides connections to internships and good first jobs through its Career Services and Internship Office. First Year Seminar and programming—what to do with your major/ connect with careers; work with students through academic departments—exploration, preparation, engagement and transition phases; Beacon Student Success Fellows—\$1,500–\$3,000 for summer experience; host job fairs, boutiques, postings; launching PACE.	1,010 internships for credit; 85 Beacon Student Success Fellows	Recently launched PACE: Professional Apprenticeship Career Experience program ramping up to a goal of 750 students participating in the next five years.
Bridgewater State University	Internship Office manages internships for students; provides readiness for academic programs that do not require internships; raises \$ for endowment to assist with stipends to students, hosts internship and job postings, sends postings to students. Taps into State University Internship Incentive Program to provide stipends for unpaid internships.	663 funded internships in 2018–19; more than 1,300 paid and unpaid, for credit and not for credit in 2019	1,000 paid or funded internships by 2025; better tracking of non-credit internship.
Salem State University	Career Services Office offers class called Go Pro for 25 students/semester; goes into classrooms to work with students on job readiness and soft skills for programs that require internship; engage employers; counsels students; taps into State University Internship Incentive Program to provide stipends for unpaid internships.	200–300 internships for credit	Better tracking of non-credit internships; considering required first year class on career services.

Industry-Focused and Aggregated Internship Models That Were Interviewed

Organization/Industry	Brief Description	Target Population	# in 2019	Future Plans ³⁸
Project Onramp Biotechnology	Project Onramp began as a partnership among Mass Bio, MassBioEd Foundation, Massachusetts Life Sciences Center, and Life Science Cares to support low-income students to find their first work experience in the biotech industry.	Bottom Line students (college students)	52	Expand to 75 interns
Hack.Diversity Software Engineering, IT, Data Analytics	The program provides inclusive employment through an eight-month fellowship cycle for candidates entering the technology ecosystem through non-traditional pathways including bootcamps, continuing education programs and public two- and four-year colleges.	Students of color entering technology ecosystem through non-traditional pathways	50	Expand to 75 interns
Massachusetts Life Sciences Center's Internship Challenge Program Life Sciences	The program connects life sciences companies with students through an online platform and funds summer and academic year internships at small companies by reimbursing wages up to \$17/hour for a maximum of up to \$8,160.	College students and recent grads who are residents of MA or matriculating at a MA college	513 statewide during 2019-20 program year	Same as 2019 with addition of new track for data science internships (offering longer and higher-paying internships). Interns permitted to work remotely due to COVID-19.
Massachusetts Clean Energy Center Clean Energy	The program supports summer and academic year internships reimbursing clean energy companies for intern wages up to \$16/hour.	College students who are residents of MA or matriculating at a MA college	613 statewide	547 statewide interns in 2020; plans to keep program similar to previous years
Massachusetts Technology Collaborative Internship Program	The program provides matching grants to eligible tech companies headquartered in MA and with fewer than 100 employees locally to partially reimburse intern salaries. Intern is employed May 1 to September 30.	MA resident currently enrolled or recently graduated from a 2- or 4-year college or university or a graduate student	200 interns	129 interns statewide in 2020; plans to keep the program similar to previous years
Forest Foundation Nonprofit	The goal is to foster the next generation of public service leaders through paid summer nonprofit internships.	Students with a passion for and demonstrated experience in community service	40-50 (1/3 from Boston)	Same as 2019

Detailed descriptions of each of the internship programs we interviewed can be found in Appendix 5.

IV.

Findings and Recommendations

Key Findings

The study team set out to understand how low-income and first-generation four-year college students are faring in the internship and bachelor-level job market in Greater Boston; the existing capacity to connect these students to internships and good first jobs; and the projected need for career connections services. Consistent with recent national studies,³⁹ we found wide variation by major in internship participation and success in securing a good first job for these students. We also found a significant boost in first-year job outcomes across majors for students who participated in an internship or otherwise received comprehensive career counseling and placement services. Effective programs and promising practices, including those we identified, could make a real difference in closing the opportunity gap between low-income students and students from more privileged backgrounds—a need that will be even more acute in a Greater Boston economy recovering from severe coronavirus-induced contraction.

I. FIRST-YEAR EMPLOYMENT OUTCOMES OF GRADUATES OF PUBLIC COLLEGES THAT SERVE A HIGH PROPORTION OF BOSTON STUDENTS VARIED WIDELY BY MAJOR. Employment in a BA-level job the year after graduation ranged from a high of 94% for nursing majors to a low of 44% for criminal justice majors, with an average rate of 68% across all majors. For several majors, 60% or fewer graduates achieved a BA-level job. Students pursuing professional degrees or quantitatively focused majors had the highest rates of BA-level employment and higher-than-average first year earnings. Graduates of majors with less direct professional application to the job market, such as psychology, humanities, and the natural sciences, had lower-than-average rates of achieving a better-paying

BA-level job and lower-than average earnings during the first year after college.

- 2. CLOSE TO 60% OF BPS STUDENTS WHO GRADUATED FROM THE PUBLIC COLLEGES INCLUDED IN THE STUDY MAJORED IN FIELDS WITH LOWER-THAN-AVERAGE EARNINGS AND RATES OF PLACEMENT IN BA-LEVEL JOBS.** BPS students were also underrepresented in two of the highest paying majors—nursing and engineering.
- 3. THE AVERAGE STARTING SALARY OF LOW-INCOME BOSTON STUDENTS WAS APPROXIMATELY 20% LESS THAN THE AVERAGE STARTING SALARY FOR NEW ENGLAND COLLEGE GRADUATES.** The starting salary of low-income graduates from Greater Boston serviced by Bottom Line was \$44,849 compared to a starting salary of \$55,624 for all 2018 college graduates in New England.
- 4. STUDENTS WHO PARTICIPATED IN AN INTERNSHIP IN COLLEGE HAD HIGHER RATES OF BA-LEVEL EMPLOYMENT, BUT ACCESS TO INTERNSHIPS VARIED WIDELY BY MAJOR.** Across the seven colleges included in the study, students who completed at least one internship had significantly higher rates of achieving a BA-level occupation—75%, compared to 63% of students who did not have an internship. Most majors showed a 10 to 12 percentage-point benefit from internship experience. The positive association between internship experiences and subsequent BA-level employment was particularly noteworthy for liberal arts and similar majors, who have a difficulty securing BA-level jobs. For example, psychology majors who participated in an internship had a 65% placement rate in a BA-level job, compared to 56% for their peers without an internship. But only a relatively small percentage of students in these majors had access to an internship experience.

Students majoring in humanities, psychology, and natural sciences had the lowest rate of participation at 23%. Communications majors had the highest rate of participation at 50%.

5. **THERE WAS SIGNIFICANT VARIATION IN INTERNSHIP PARTICIPATION ACROSS THE SEVEN PUBLIC COLLEGES IN THE STUDY, WITH UMASS BOSTON, THE PUBLIC UNIVERSITY SERVING THE LARGEST NUMBER OF BOSTON STUDENTS, HAVING ONE OF THE LOWEST RATES, AT 24%.** While more than half (53%) of all students at UMass Amherst had at least one internship, less than one quarter of UMass Boston students did so.
6. **PUBLIC UNIVERSITIES HAVE BEEN RAMPING UP SERVICES TO CONNECT STUDENTS TO INTERNSHIPS AND OTHER WORK-BASED LEARNING EXPERIENCES.** Career services and internship offices are only able to provide a fraction of the students on campus with internship preparation and connections, though some expansion efforts are under way. The Commonwealth's State University Internship Incentive Program has helped the state universities (does not include the UMass system) provide stipends to students in unpaid internships. UMass Boston has raised funds to establish the Beacon Student Success Fellowship, to expand support for internships and summer learning experiences. Bridgewater State University has set a goal of 1,000 paid or funded internships by 2025 and UMass Boston expects to ramp up participation in its new PACE program from 30 students in 2020 to 775 within five years. Efforts like these are a start toward providing support to students at greater scale.
7. **CREATING SPECIALIZED TEAMS THAT CAN BECOME TRUSTED SUPPLIERS OF DIVERSE ENTRY-LEVEL TALENT TO EMPLOYERS IS A PROMISING STRATEGY FOR BOOSTING INTERNSHIP AND EMPLOYMENT OUTCOMES OF LOW-INCOME STUDENTS.** Both Bottom Line and Thrive Scholars have created dedicated units within their organizations that focus on recruiting and developing relationships of trust with employers. Both organizations emphasized the specialized skills and dedicated staff required to recruit

employer partners and establish preferred talent sourcing relationships. The steady increase in the percentage of Bottom Line graduates securing full-time employment in positions relevant to their career goals between 2015 and 2018 provides initial evidence for the promise of this approach.

8. **A SIGNIFICANT EXPANSION OF CAPACITY IS NEEDED TO PROVIDE ACCESS TO INTENSIVE, MULTI-YEAR CAREER DEVELOPMENT SUPPORTS TO ALL THE LOW-INCOME BOSTON COLLEGE STUDENTS.** Bottom Line and Thrive Scholars, the two college success organizations identified in the study as providing a formal system of intensive career coaching and internship/job placement services, are able to serve 550 new students each year. We estimate the annual number of low-income students who attend a college or university in Massachusetts from BPS non-exam, John D. O'Bryant, and charter high schools will be 1,301 by 2023, leaving close to 750 students unable to be served by these programs. While there may be some programs that we missed in our scan of organizations, it is reasonable to assume that our estimate approximates the magnitude of the unmet need.
9. **INDUSTRY-FOCUSED INTERNSHIP PROGRAMS THAT AGGREGATE EMPLOYER DEMAND OFFER SIGNIFICANT ADVANTAGES OVER AD HOC RECRUITMENT MODELS.** Industry-focused programs that centralize internship opportunities are able to connect employer partners with college success organizations and university career centers in a way that is much harder for institution-by-institution recruitment to achieve. Well-established internship programs provide one model for growing internship opportunities at an industry level. For example, the Massachusetts Life Sciences Center, the Massachusetts Clean Energy Center, and the Massachusetts Technology Collaborative collectively sponsored 1,326 internships to students statewide in 2019, and partnered with universities to recruit students for these placements. (These programs do not explicitly focus on low-income four-year college students.) Over the last few years, some industry associations have also launched internship programs with an explicit goal of serving

low-income college students and students of color. These programs, which include Hack.Diversity and Project Onramp, provide strong cohort training, mentorship, and networking opportunities in addition to paid internships but currently operate at small scale, providing internships to just 102 students in 2019. Expanding such efforts could accelerate access to internship opportunities for low-income Boston students and students of color.

Recommendations

Based on these findings, the study team has developed a set of recommendations that can boost the likelihood that low-income college students will engage in an internship and land a bachelor-level first-destination job.

- 1. CONTINUE TO BUILD OUT SYSTEMS AND CAPACITY ACROSS SECTORS—IN HIGH SCHOOLS, HIGHER EDUCATION INSTITUTIONS, NONPROFIT ORGANIZATIONS, AND INTERMEDIARIES—TO HELP STUDENTS UNDERSTAND THE PATHS TO SECURING A GOOD FIRST JOB ALIGNED WITH THEIR CAREER INTERESTS.** Selection of a major should align with a student’s interests, aspirations, and passions. But students also need in-depth information and practical knowledge about the opportunities that various majors open up in order to make informed decisions. New data tools are making such information more accessible and must be incorporated into career counseling programs at all levels. College Scorecard data on earnings by major by college is now available on a web-based portal sponsored by the U.S. Department of Education.⁴⁰ NextGen Talent, one of the partners in this study, is building a web-based directory of high-value technical and professional post-secondary programs for use by high school guidance counselors. Labor market information on current and projected occupational employment demand, the education/skill requirements of occupations, and earnings levels should be made more accessible to students and counselors as well. A number of initiatives at the state and district level, such as career pathways, Innovation Pathways, and the Massachusetts Early

College Initiative, are also strengthening students’ connections to careers with intentional exposure and work-based learning experiences; such experiences stand to better equip students with practical information about career options as well as the education needed to embark on them. These initiatives and resources are a start toward providing all low-income Boston students with the information they need to make informed choices.

- 2. CREATE MORE OPPORTUNITIES FOR LIBERAL ARTS MAJORS TO ACQUIRE AND DEMONSTRATE CAREER-RELEVANT SKILLS, SO THAT THEY CAN SUCCESSFULLY COMPETE FOR INTERNSHIPS AND BA-LEVEL EMPLOYMENT AFTER COLLEGE.**

Employer internship postings point to a set of high-demand skills, many of which can be learned in the context of any major. Broadly applicable professional skills such as business communications, problem-solving, research, and teamwork can be integrated into the curriculum of most courses. High demand technical skills such as Excel and other Office applications, marketing and social media, customer service, sales, and data analysis skills can be taught in the context of existing courses or through new career development offerings. Academic deans and department heads should take the lead in promoting integration of professional skills into the coursework of all majors, including liberal arts disciplines. The proliferation of free and low-cost online career-related courses offers another source for professional skills development of students. Career advisors in nonprofit organizations and career services staff in universities should curate classroom, off-campus, and online programs to help students acquire these skills and showcase them on resumé, in interviews, and on the job. Capstone projects that have real-world applications offer one way to integrate professional skills development into academic coursework. Engaging employers in the design, coaching, and evaluation of these projects is a particularly effective way to ensure career-relevance. The Experiential Network (XN) program at Northeastern University is an example of a scalable approach to employer-sponsored project work.⁴¹ In this program, students work virtually with a sponsoring business or

nonprofit organization on a short-term project over a six-week period related to a particular course. Approximately 8,000 students are participating in the program, which is geared toward the needs of graduate students who are employed full time and other students for whom extended co-op work experiences are not feasible. Partnering with organizations that specialize in professional skills training is another way for universities to provide career-relevant skills courses. Holy Cross has partnered with Fullbridge, a learning company, to deliver a four-day intensive program in business basics through simulated workplace projects. The nonprofit organization Braven is partnering with public colleges in several cities to deliver a professional skills course for low-income and first-generation students that includes employer-sponsored projects and mentors. Other learning technology companies, including Parker-Dewey and MySherpa, are matching college students with employer-sponsored micro-internships and simulated workplace experiences.

3. EXPLORE THE MOST EFFICIENT WAY TO SCALE CAREER COACHING AND INTERNSHIP/JOB PLACEMENT SERVICES TO LOW-INCOME BOSTON STUDENTS SERVED BY COLLEGE SUCCESS ORGANIZATIONS THAT LACK THIS COMPONENT.

Several college success organizations, including OneGoal and the postsecondary support teams of charter school organizations, expressed interest in more intensive career coaching and internship/job placement services for their students than they are currently able to provide. It would appear costly and inefficient to create within each of these organizations the specialized capacity needed to provide internship and job placement services on a trusted-supplier basis with employers, compared to a more centralized resource. A centralized process would also be a more effective way to engage employers with limited bandwidth to respond to multiple partnership requests. One possibility for creating a centralized career-coaching and placement service would be to support expansion of Bottom Line's Career Connections program, which is now meeting approximately 40% of the projected need, to meet the full need. Alternatively, a new

intermediary vehicle could be established to provide similar services to meet the remaining need. Either option would require significant new resources but would be less costly and more efficient than building these services within each college success organization. We recommend convening the key stakeholders to evaluate options for expanding capacity to provide career placement services and identify the most promising business model(s) to scale.

4. MOBILIZE CORPORATE LEADERS AND INDUSTRY ASSOCIATIONS TO CREATE MORE INTERNSHIP PROGRAMS THAT SPECIFICALLY RECRUIT LOW-INCOME STUDENTS AND STUDENTS OF COLOR AS A MEANS TO REDRESS INEQUITIES IN EMPLOYMENT.

Targeted efforts to aggregate employer demand and provide internships for low-income students and students of color—such as Hack.Diversity or Project Onramp—provide models for other industry groups to follow. With a growing number of corporations committing to affirmative steps to combat systemic racism in response to the current nationwide movement for racial justice, the time would seem ripe to take bold action to diversify the workforce in Greater Boston's growth industries.

5. EXPAND PARTICIPATION OF LOW-INCOME STUDENTS AND STUDENTS OF COLOR IN EXISTING LARGE-SCALE INTERNSHIP PROGRAMS.

The Massachusetts Life Sciences Center, Clean Energy Center and Technology Collaborative collectively sponsored 1,326 internships in 2019. Strengthening the talent development pipeline between these industry initiatives and UMass Boston and other local state universities serving a large portion of Boston students is one means to increase access to these internships. Lessons drawn from the successful partnership between the Massachusetts Life Sciences Center and both UMass Amherst and UMass Lowell could help guide that process. Formal recruiting partnerships with college success organizations, with a certain number of placements reserved for low-income students and students of color, would be another option.

6. SUPPORT DEVELOPMENT OF VARIED WORK-BASED LEARNING MODELS TO ADDRESS THE NEEDS OF LOW-INCOME COMMUTER STUDENTS. UMass

Boston serves 25% of four-year college enrollees from Boston’s non-exam and O’Bryant high schools—far more than any other higher education institution. The vast majority are commuter students working full- or part-time jobs to meet living expenses. Creating internship and other work-based learning opportunities for commuter students juggling school, work, and family obligations can be particularly challenging, but also particularly important. The newly launched Professional Apprenticeship Career Enhancement program (PACE), which promises on-campus paid internships, mentoring, and networking sessions for first- and second-year students, with a transition to paid internships off-campus in the junior and senior years, is an innovative model worth tracking. Co-operative education may be another option worth supporting for implementation at UMass Boston and elsewhere. Members of the advisory committee and college success staff noted that many businesses are expressing interest in co-operative learning and other models that provide an extended work-based experience, but apart from Northeastern University and Wentworth Institute of Technology, very few schools offer these opportunities for students. Co-op placements would enable these students to meet their financial needs while engaging in career-relevant work experiences. In a similar vein, helping commuter students secure part-time jobs with better alignment to their career-goals when they need to work to support themselves may be another option worth pursuing.

Appendices

APPENDIX 1

Advisory Committee

An Advisory Committee provided guidance to the study design, reactions to initial findings, and advice regarding recommendations. The research team would like to thank members of the committee and the Boston Foundation for their support of the research and insights to inform the recommendations.

ADVISORY COMMITTEE MEMBERSHIP

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APPENDIX 2

Data Sources and Methods

GROUPING OF RELATED MAJORS INTO BROADER CATEGORIES FOR ANALYSIS

For analyses that focused on results by major, related majors were grouped into broader categories. The table in this appendix indicates the broader categories to which specific majors were assigned.

A few majors that could fall in multiple traditional categories and had small numbers of graduates, such as Multi/Interdisciplinary Studies, were assigned to the “Other” category. Given the heterogeneity of the small and unrelated majors grouped into the “Other” category, this category was not displayed in analyses of results by major. However, data from graduates in the “Other” category was included in calculations of overall results.

COLLEGE SCORECARD DATA [HTTPS://COLLEGESCORECARD.ED.GOV/](https://collegescorecard.ed.gov/)

In November 2019, the U.S. Department of Education expanded its College Scorecard to include data on first-year earnings of a school’s graduates by field of study. The earnings data is based on the cohort of students who received federal financial aid at any time in their academic career and is derived from IRS tax data linked to federal financial records. For public colleges such as the seven included in this study, the share of students receiving federal financial aid is substantial. According to the National Center of Educational Statistics, 60% of undergraduates attending public four-year colleges receive federal financial aid. The cohort is further defined to include graduates who were employed and not in school the year following graduation. This first round of published earnings data is based on the first-year earnings of a combined two-year cohort of students who graduated in 2014–15 and 2015–16, measured in calendar years 2016 and 2017, respectively. The earnings are then inflation-adjusted to 2018 dollars. Earnings for fields of study with insufficient sample sizes are suppressed for privacy reasons.

BURNING GLASS JOB POSTING DATA

Burning Glass collects job postings from close to 50,000 online job boards, newspapers and employer sites on a daily basis and de-duplicates postings for the same job, whether posted multiple times on the same site or posted across multiple sites. Burning Glass then applies detailed text analytics to code the specific jobs, skills and credentials requested by employers. This study used national and Boston metro area job posting data on advertised education requirements to classify an occupation as bachelor-level. Boston metro area job demand for the full year 2019 was used to estimate demand for internship and entry-level jobs by career area and advertised major. Following most public statistics, the Boston metro area is defined as the Boston-Cambridge-Nashua, MA-NH Metropolitan NECTA.

SOCIAL PROFILE DATA

Analysis of internship and first-year career outcomes of graduates of the seven Massachusetts public universities was based on Burning Glass’s social profile database, which contains detailed work history and education for millions of individuals who post profiles on career-related online social platforms. The information included in the database is restricted to profile data that individuals make available for public viewing.

Profiles of graduates from the seven public colleges were included in the study if they met the following criteria: the individual had graduated between 2014 and 2018 with a bachelor's degree and the individual was not already employed in a bachelor-level occupation prior to enrolling in college. The latter criterion was applied to screen out mid-career professionals who had already achieved success in the job market, as the study's focus was on first-job outcomes of traditional-aged students with limited work experience prior to college. Analysis of first-year employment outcomes was based on the cohort of graduates who were employed in May of the year following graduation and not enrolled in school. In addition, the profile needed to contain sufficient information to assign the job held in May following graduation to an occupation. Burning Glass was able to assign an occupational code to 76% of the jobs held by new graduates, yielding a sample of 22,219 graduates for analysis. Burning Glass used a proprietary occupational taxonomy that closely tracks the federal ONET taxonomy but includes some additional occupations such as Product Managers that are not yet included in ONET to code jobs to occupations.

In addition to excluding graduates who were continuing their schooling, graduates with missing employment information for May following graduation were excluded from the analysis. Approximately 21% of graduates had no work experience listed on their profile the year following graduation. This missing data could reflect a choice by individuals not to update their profiles. However, we found that 52% of graduates with missing first year employment data had a work experience listed for a subsequent year, indicating that they were continuing to update their profile. It is therefore likely they were unemployed in May following graduation or had intentionally omitted nonprofessional first-year employment from their profiles. To the extent that graduates omitted non-professional, first-year employment experiences unrelated to their career goals, the percentage of students underemployed in a non-BA job following graduation could be higher than estimated.

To analyze the impact of program of study on internship and employment outcomes, Burning Glass categorized the program of study listed in a graduate’s social profile into the National Center for Education Statistics Classification of Instructional Programs (CIP). These CIP codes were aggregated into broad majors for analysis.

Areas of Study

Majors	Broad Major Categories
Agriculture, Agriculture Operations and Related Sciences	Agriculture and Related Sciences
Natural Resources and Conservation	Natural Resources and Conservation
Architecture and Related Services	Architecture and Construction
Area, Ethnic, Cultural, and Gender Studies	Humanities
Communication, Journalism and Related Programs	Communications and Related Studies
Communications Technologies/Technicians and Support Services	Communications and Related Studies
Computer and Information Sciences and Support Services	Computer and Information Sciences
Education	Education
Engineering	Engineering
Engineering Technologies/Technicians	Engineering
Foreign Languages, Literatures, and Linguistics	Humanities
Family and Consumer Sciences/Human Sciences	Other
Legal Professions and Studies	Social Sciences
English Language and Literature/Letters	Humanities
Liberal Arts and Sciences, General Studies and Humanities	Humanities
Biological and Biomedical Sciences	Natural Sciences
Mathematics and Statistics	Mathematics and Statistics
Multi/Interdisciplinary Studies	Other
Parks, Recreation, Leisure and Fitness Studies	Fitness and Recreation Studies
Philosophy and Religious Studies	Humanities
Theology and Religious Vocations	Humanities
Physical Sciences	Natural Sciences
Psychology	Psychology
Security and Protective Services	Criminal Justice
Public Administration and Social Service Professions	Social Service and Public Administration
Social Sciences	Social Sciences
Economics	Economics
Construction Trades	Architecture and Construction
Transportation and Materials Moving	Other
Visual and Performing Arts	Visual and Performing Arts
Registered Nursing, etc.	Nursing
Health Professions and Related Clinical Sciences	Non-Nursing Health Sciences
Business, Management, Marketing and Related Support	Business
Accounting	Accounting and Finance
Finance	Accounting and Finance
History	Humanities

APPENDIX 3

Graduates from seven public colleges have similar majors as those from all four-year colleges and universities (BPS non-exam and O'Bryant graduates)

Field of Study	All 4-Year Colleges	Seven Public Colleges
Accounting and Finance	4.8%	3.6%
Business	14.1%	17.8%
Communications and Related Studies	4.2%	3.6%
Computer and Information Sciences	3.6%	3.6%
Criminal Justice	5.3%	10.4%
Economics, General	3.2%	4.7%
Education	1.8%	1.7%
Engineering	5.6%	3.3%
Humanities	8.0%	5.9%
Fitness and Recreational	1.4%	4.7%
Mathematics and Statistics	1.5%	2.8%
Natural Sciences	7.1%	6.4%
Non-Nursing Health Sciences	5.0%	3.3%
Nursing	3.3%	3.1%
Psychology	10.1%	11.4%
Public Administration and Social Service	2.8%	1.9%
Social Sciences	11.4%	9.2%
Visual and Performing Arts	4.9%	1.2%

Source: PIC analysis of NSC data

APPENDIX 4

Definition of an Entry-Level Job and a Bachelor-Level Occupation

ENTRY-LEVEL JOB

Job postings that advertised an experience requirement of two years or less were counted as entry-level positions. Job postings that did not specify an experience requirement were also counted as entry-level.

BACHELOR-LEVEL OCCUPATION

For the purposes of this study, bachelor-level occupations are defined as those with 1) 50% of postings asking for a bachelor's degree nationally over a 12-month period (November 2018 through October 2019), or 2) at least 40% of postings in the Boston metro area requesting a bachelor's degree and offering median salaries of \$51,000 or more over the same 12-month period. These criteria were developed to balance the goals of aligning with the definitions used in recent national studies, responding appropriately to the specifics of the Boston metro area labor market and ensuring face validity.

Several national studies consider an occupation bachelor-level if at least 50% of jobs require a bachelor's degree, as determined by job postings or surveys of current holders of such jobs.⁴² To make our definition more responsive to the possibility that some occupations that do not require postsecondary education in general might do so in the Boston area because of the local economy's emphasis on educational credentials in its advanced industries, we expanded our definition to include occupations that met both of two specific criteria based on local labor market conditions. The specific threshold for local educational requirement (40% of postings) was set in consultation with experts on the Boston area labor market to ensure the face validity of categorizations. For example, a 40% threshold was chosen over a 50% threshold so that robotics technicians and other high-skill, high-paid positions would be categorized as bachelor's level occupations. To ensure we did not include low skills occupation in which many employers request bachelor's degrees simply as a shortcut to screening for actual ability (a practice also known as "degree inflation"), occupations could only be included based on educational requirements if the local median salary was close to (not more than 1% below) or above the local median income. Since the Boston metro area's median income at the time was \$51,500, this translated into a threshold median salary of \$51,000. These thresholds were set before outcome analyses were conducted.

APPENDIX 5

Internships by Career Areas, Boston Metro Area 2019

Career Area	% of Postings
Information Technology and Math	23
Marketing and Public Relations	20
Engineering	14
Business Management and Operations	14
Finance	8
Sales	5
Science and Research	4
Health Care	3
Education and Training	2
Design, Media and Writing	2
Law, Compliance and Public Safety	1
Clerical and Administrative	1
Customer and Client Support	1
Social Science	1
Manufacturing and Production	1
Other	1

Source: Burning Glass Technologies: Based on jobs posting from January-December 2019 for Boston Metro Area

APPENDIX 6

Descriptions of Internship Programs Interviewed for Study

College Success Organizations

Staff were interviewed at Bottom Line, Thrive Scholars (formerly SCS Noonan Scholars) and Excel Academy Charter School. While Excel Academy provides some career connection services, for the most part its staff focus on college access and success. These programs recognize that graduating from a four-year college may not in and of itself lead to a good first job and upward mobility. This recognition drove Bottom Line and Thrive Scholars to build out their career connections services. Intentional programming around career goals, exposure and connections is critical to supporting first generation and low-income students to successfully attain internships and good first jobs following graduation.

BOTTOM LINE'S CAREER CONNECTIONS PROGRAM

[HTTPS://WWW.BOTTOMLINE.ORG/](https://www.bottomline.org/)

Bottom Line provides academic, financial, and career counseling services to 2,300 students in Boston and Worcester from low-income households and in the first generation of their family to earn a bachelor's degree.⁴³ It has the capacity to add 500 new students each year from Boston. Students in the college access program enroll as a rising high school senior to participate in college access services. Students who enroll in the 18 local colleges served by Bottom Line receive college success supports through their senior year in college (if there were additional capacity, Bottom Line would enroll additional students). Bottom Line is expanding nationally and operates in Chicago and New York City in addition to Boston and Worcester.

Bottom Line has a framework and curriculum for college and career success that lays out the skill attainment goals relevant to becoming career ready for each of the four years of college. This framework works across a continuum of: Explore, Expand, Experience, and Establish. Within each of these categories is a set of activities and key milestones and goals established in 2019:

- 80% of students accomplish 20 percent of milestones each year
- 75% of students complete the program with career-relevant experience. Bottom Line's baseline is 66% and its goal over three years is to raise this to 90%.⁴⁴

Bottom Line formalized its Career Connections team in 2018 and created a team of four full-time employees locally and one FTE to coordinate efforts nationally. A primary function of Bottom Line's Career Connections model is employer engagement, developing industry partnerships and pipelines for internships and good first jobs. The Career Connections team is organized by sector with a staff person each assigned to business, finance and consulting, STEM and healthcare, and social impact work (education, criminal justice, social sciences). A director of corporate partnerships cultivates opportunities to partner with and develop internship pipelines from corporate partners. College success advisors are trained by the Career Connections team to support students with general career services, such as career exploration and readiness. The Career Connections team brings industry specific insight and employer relationships. Team members are able to tap into the network of college success advisors to share internship and job opportunities, identify students with interest in those opportunities and coach those students in career readiness and career success skills, including resume writing, cover letters and mock interviews.

Bottom Line has developed the capacity to measure progress toward its goal of students' securing a successful "first destination" job within six months of graduation. Staff defined "first destination" job as meeting two of three criteria:

1. Earnings are on par with the average for their industry
2. Job is related to the student's career path
3. Job will build skills to support career goals

They have set targets to ensure that graduates are achieving economic mobility:

- 80% of graduates will have landed a full-time job or be enrolled in graduate school six months post-graduation
- 70% of graduates will report to be in a job that prepares them for long term success because it is related to their career goals and/or they are earning a salary reflective of the average for their industry. Currently, 50% of graduates are hitting this mark.⁴⁵

Bottom Line is not currently planning to scale its services in Boston to more than 500 new students each year, largely as a result of funding constraints. Staff are looking at ways to increase their Career Connections impact beyond direct service. These may include lighter touch services, providing broader thought leadership and working with corporate influencers to do more internship aggregation and think differently about their hiring process.

THRIVE SCHOLARS

[HTTPS://WWW.THRIVESCHOLARS.ORG/](https://www.thrivescholars.org/)

Thrive Scholars (formerly SCS Noonan Scholars) serves high achieving students of color who are first generation college students with a GPA of 3.7 to 4.0 and an SAT score of 1100+ and who demonstrate grit and determination. Students who are Thrive Scholars enroll in the top 100 colleges and universities across the United States. The organization is serving students across the country, with significant cohorts in Los Angeles and Greater Boston, and new cohorts in Chicago and Cleveland, providing college access, college success and career development services beginning in the junior year of high school and continuing through college graduation. In the Boston area, Thrive is currently serving 116 students, including graduates of Boston schools and others from around Greater Boston. In Boston, Thrive also serves a sizable group of students who are coming from another region of the country to attend college in Boston. Of the 116 current Greater Boston students, 15 are in high school and 101 are in college. Thrive plans to accept around 30 students or more each year in the Boston area.

A critical part of its delivery model is a six-week summer academy, a residential academic program with guidance, social and emotional supports, and college advising. The career development team is based in Los Angeles and serves students nationwide. The team includes a chief program officer who designed Thrive's new career development program, a program manager, two full-time career coaches, two part-time career coaches, and a director of alumni relations. Thrive Scholars is also actively hiring a director of corporate partnerships and a senior director of career development. Services are delivered by the coaches in conjunction with an online platform that provides a scholar portal and a learning management system. Beginning their sophomore year in college, students work directly with a career coach. These services continue through graduation and attainment of a good first job. The summer after their junior year is often when the first internship takes place and students are coached in 21st century skills, team work, and knowledge work. The career services team also encourages students to leverage career services from their college or university.

The national career services team develops corporate partnerships. Team members work with companies interested in corporate diversity, often in the finance, technology and biotechnology industries. The Corporate Partnership Program explicitly includes internships. Corporate partners typically make internships and jobs available to students using their company's regular application and hiring process. Thrive Scholars perceives internships as a gateway to a good first job. If students can garner an internship the summer after their junior year of college, that often leads to a full-time job with that employer or provides a credential to secure a full-time job at another company. Internships provide an important skill development and networking-building opportunity as well. Thrive's goal is to get 90% of its students a summer internship after junior year; the other 10% may be interested in doing research over the summer.

In addition to measuring the rate of juniors who attain an internship, Thrive Scholars set goals of 95% of graduates working in full-time jobs within six months of graduation with a starting salary of \$56,000 or greater. This goal is pegged to outcomes of students graduating from the same colleges attended by Thrive Scholars students. They are also looking for students to have a successful network and experience promotions: 90% of scholars have a network of five people who can help to support their professional growth; 70% of alumni experience a promotion within 24 months of starting their first job. Currently they have 29 alumni of the Boston program who graduated from college between 2018 and 2020. These metrics require staff to focus on support and tracking in addition to direct services.

Thrive Scholars seeks to reach scale of serving 1,800 students nationally. Its goal is to triple the number of students nationally while only doubling the size of its budget. As part of its growth, Thrive Scholars aspires to grow the number of students served in Boston. They are expanding nationally and recently added new cohorts in Chicago and Cleveland.

EXCEL ACADEMY CHARTER SCHOOLS AND NEXT GEN TALENT

[HTTPS://WWW.EXCELACADEMY.ORG/OUR-SCHOOLS/HIGH-SCHOOL/](https://www.excelacademy.org/our-schools/high-school/)

[HTTPS://WWW.NEXTGENTALENT.ORG/](https://www.nextgentalent.org/)

Excel Academy Charter Schools has one of the most developed college success programs among Boston's Commonwealth charter schools. For several years, before the school had high school grades, Excel Academy Charter Schools employed postsecondary counselors to provide support to alumni of its East Boston middle school after they graduated from high school elsewhere. The founding of Excel Academy High School in 2015 created a seamless transition for its middle school students to a common high school and enabled the development of a comprehensive College Access and Postsecondary Success program (CAPS) starting in grade 9. Excel Academy High School graduated its first class of 94 students in 2019, with 78% enrolling in four-year colleges and 10% enrolling in two-year college. The school anticipates 145 graduates this spring and 170 graduates per year going forward.

Excel's two postsecondary counselors provide comprehensive one-to-one counseling on academic, social and financial issues throughout a student's college experience. Counselors also provide limited career-related services, including help with resumes and cover letters, conducting mock interviews, and connecting students to career services provided by their colleges. In 2018, Excel Charter Academy received a catalyst grant from the Wellington Foundation to incubate a new organization, NextGen Talent, to bolster the career-related component of its high school and postsecondary counseling programs. Excel Academy serves as a pilot site, with a goal of expanding NextGen Talent's career-related services to a broader community of schools and college success organizations. NextGen Talent has also partnered with OneGoal, which serves six Boston high schools and nine high schools elsewhere in Massachusetts, to integrate career services into its college success model.

During its first year of operation, NextGen Talent focused on developing two web-based platforms to serve high school and first-year college students:

- An online directory of “high value” technical and professional postsecondary programs that lead to a good first job. These career-focused programs include associate degree programs in automotive and radiologic technology, bachelor degree programs in nursing and engineering, and apprenticeship programs in the building trades.
- An online career exploration platform called “Elevate” that connects students to local “Career Guides,” working professionals who reflect the racial and ethnic diversity of Boston students. Career Guides working in a broad range of occupations provide students with first-hand information about their careers and the path they took to get where they are.

University Career Services and Internship Offices

According to a Boston Private Industry Council analysis of National Student Clearinghouse data, approximately 50% of recent graduates from Boston Public Schools’ non-examination high schools and the John D. O’Bryant High School enrolled at four-year colleges are attending the seven local public universities. UMass Boston has the largest number of non-exam school students among the four-year publics with an average enrollment of 275 graduates from the classes of 2017 and 2018. The top two state universities for enrollment were Bridgewater State (average of 58 graduates) and Framingham State (average of 37 graduates). In order to understand career service capacity, planning, and programing at public universities, the study team interviewed Career Services and internship staff at UMass Boston, Bridgewater State University, and Salem State University (average of 29 graduates).⁴⁶

The universities all support students majoring in academic programs that require internships in order to graduate and provide credit for the internship course. In many colleges, academic programs such as accounting and communications require an internship in order to graduate. The supports include resume-writing, mock interviews, and professional skill preparation. They also provide similar services in a less formal way to students who are seeking an internship but are not required to complete one for their field of study. The universities all struggle to track the total number of students who participate in an internship, for the most part tracking participation for those who take an internship course for credit.

In 2012, Massachusetts created a \$1 million line item in the annual state budget to support internships for students matriculating at one of the state universities (this does not include the University of Massachusetts system). The program is called the State University Internship Incentive Program. The budget line item was established in the Fiscal Year 2013 budget and appropriates \$1,000,000 to the Program each year. The program requires a dollar for dollar match. The dollars are distributed to each state university based on its relative share of full-time equivalent students. Each university operates a unique internship program supported by this line item and privately raised funds in some of the colleges. Bridgewater State University and Salem State University use this program to provide stipends for students participating in unpaid internships and in some cases may provide transportation support.

UMASS BOSTON (UMB)

UMASS BOSTON CAREER SERVICES [HTTPS://WWW.UMB.EDU/ACADEMICS/VPASS/CAREER_SERVICES](https://www.umb.edu/academics/vpass/career_services)

UMass Boston provides connections to internships and good first jobs through the Career Services and Internship Office. Career Services participates in First Year Seminars to introduce careers and how students’ majors connect to careers. They work closely with academic departments to help students explore careers and build a plan. The student’s career plan is parallel to their academic plan and includes exploring

internships and other career opportunities. The student's plan works through four phases: exploration, preparation, engagement, and transition. Exploration leads to preparation of their resume and cover letters, interview skills, and networking. Preparation is followed by engagement (participation) in internships and career opportunities. Engagement is followed by transition; in this phase students are supported in their efforts to interview and negotiate salary and other compensation in their first job.

Like many low-income students, UMB students often work in full-time jobs and it can be challenging to take on an internship, particularly if it is unpaid. As a result, UMB created the Beacon Student Success Fellowship to support unpaid or low paid internships or other summer learning experiences. This Fellowship provides an award of \$1,500 to \$3,000 for a summer experience, which may include internships or study abroad. Fellows present what they learned in the fall through a showcase. In academic year 2018–19, 85 students pursued experiences through this fellowship.

UMB uses the software platform Handshake to manage employer engagement including career fairs, online postings, setting up interviews, and other boutique events with employers. There are over 7,500 employers in the system and 600 employers came to campus in the last academic year before the COVID-19 pandemic. The university works with many of the larger industries in Boston including finance and banking, biotechnology, healthcare, hospitality, services, sports management, publishing, engineering, advertising, and property development.

Career Services works with all academic departments and there is an internship course available in each of the academic departments for which students can earn credit. Twenty academic departments require internships to graduate (these may also include clinical placements for health-care majors and practicums for education majors).

UMass Boston tracks the number of students who enroll in an internship course; last year there were more than 1,000 students who earned academic credit for an internship; that number jumps to more than 6,000 when you include clinical placements and practicums. Like many universities, UMass Boston does not track internships that may be taking place outside of for-credit classes.

Most internships take place in the summer. UMB is a feeder school for Hack.Diversity and works closely with the Massachusetts Life Sciences Center to support students in applying for internships through the MLSC portal.

In the spring, UMB announced a new venture called PACE (Professional Apprenticeship Career Enhancement), supported by a \$2.25 million philanthropic gift. PACE will include on-campus paid apprenticeships for first- and second-year students under the guidance of staff in areas like IT, finance, communications, and health services. Students will also have the opportunity to participate in half-day networking sessions with Boston business leaders, leading to jobs, internships and mentoring opportunities. The experience transitions to paid internships off campus in the junior and senior years in 20 industry clusters. PACE launched as a small pilot in the spring of 2020 with 30 students and plans to ramp up with 50, 200, 400, 575 and 775 students in each of the next five years.

BRIDGEWATER STATE (BSU)

BSU INTERNSHIP OFFICE [HTTPS://WWW.BRIDGEW.EDU/ACADEMICS/INTERNSHIPS](https://www.bridgew.edu/academics/internships)

BSU manages internships for students through its Internship Office, which sits in the Division of Outreach and Engagement and is physically co-located with Career Services. Career Services supports students in developing their resumes, cover letters and interview skills. The Internship Office supports students in preparing for their internship through one-on-one coaching.

BSU set a goal in its strategic plan to reach 1,000 paid or funded internships per year by 2025. In 2018–19 academic year, there were 663 paid or funded internships and more than 1,300 paid and unpaid, for-credit and non-credit, undergraduate and graduate internships. BSU has a goal of 750 paid or funded internships in 2020. The Internship Office tracks the number of internships and added a survey last summer to try to reach students who found their own internships. The office is considering adding a course code for non-credit internships so it will be included in the student record and can be counted.

Companies post internships on Handshake, the University Job Board. The Internship Office distributes the postings to students who apply on their own and follow the company’s hiring process. Companies recruit on campus at career fairs. Students may find their own internships and faculty play a key role in connecting students to internships.

Certain majors require an internship or field experience: athletic training, social work, health science and public health; for criminal justice students, an internship is one of three options for a course. Many of the for-credit internships are not paid but may be stipended up to \$1,000 through the college’s endowment or the State University Internship Incentive Program. When an internship is taken for credit, it is generally offered in the Fall or Spring, although there are some that take place in the summer. Students who are receiving credit for their internship are supervised by faculty. The for-credit internship experience lasts for 13–15 weeks; students are required to work 135 hours to qualify for three credits.

SALEM STATE UNIVERSITY (SSU)

SSU CAREER SERVICES [HTTPS://WWW.SALEMSTATE.EDU/CAMPUS-LIFE/STUDENT-SERVICES/CAREER-SERVICES/CAREER-SERVICES-STUDENTS](https://www.salemstate.edu/campus-life/student-services/career-services/career-services-students)

Salem State University manages internships and employer engagement through its Career Services office. Students hear about career services and internships through social media and print advertising and open houses before they start classes. Many students choose to do internships in the summer because they are often employed full-time in an entry-level job and have less time during the school year. SSU provides a stipend for some students who are doing an unpaid internship through the state’s Internship Incentive Program.

Career Services offers a Go Pro class for 25 students per semester and works with academic classes that require internships. Go Pro is a one-credit, eight-week course to support students in identifying their skills, values, and career interests; create resumes and cover letters, and develop skills for networking and interviewing. Career Services also reaches students in the classroom, particularly for those academic departments that require internships. Career Services goes into the classroom to help students prepare resumes, practice interviewing, respond to emails, and discuss other details.

Like other colleges, SSU finds it difficult to track the number of internships for students who are not receiving course credit. Annually 200–300 students are required to do an internship for their field of study. Currently the university is tracking internships through the registrar for those who are receiving course credit. They also get some data through Handshake, the software platform used to manage employer relationships and internships.

Employers connect with students on campus and online. On campus, employers may engage with students in smaller numbers in a classroom, providing a presentation to a group of students or participating in mock interviews. Employers are looking to establish a trusted brand with students who are interested in internships and first jobs. More than 3,200 employers actively post jobs on the Salem State website.

Industry-Focused and Aggregated Internship Programs

Aggregating internship demand through industry associations is a promising strategy to mobilize companies to provide paid internships and co-invest in a skill building and support infrastructure that creates a pool of diverse talent for that industry. These programs aim to build a diverse talent pool of students with the skills and experiences to find employment at companies in the targeted industry. Through the Massachusetts Life Sciences Center, Massachusetts Clean Energy Center, and Massachusetts Technology Collaborative, the Commonwealth has been a leading state in promoting, facilitating, and sponsoring internship experiences across the innovation economy.

These industry-focused programs leverage their membership and networks to identify internship openings and post and hire for those openings through the industry-based internship program. This provides member companies the opportunity to recruit, support, and develop candidates from underrepresented communities without having to develop its own internal infrastructure to work with multiple referral organizations and develop unique programming. This approach also provides an economy of scale for the referral organizations, providing a single point of entry for applications and cohort-wide programming that builds the skills and networks of the students that they serve. Industry associations acting as a trusted intermediary are able to effectively build scale and impact across multiple companies.

An important part of the internship programming in the industry-aggregated initiatives is a set of cohort activities that usually happen on a weekly or bi-weekly basis. This programming includes workshops focusing on soft skills and career exploration, formal mentoring and networking with people working in the industry at all levels of the organization, including C-suite. The internship programs take pride in supporting interns in building a network that can help them to enter and grow in that industry. However, scaling an individual program presents challenges to the quality of the experience for the cohort of interns.

To understand capacity, programming, and scaling plans, staff were interviewed at Hack.Diversity, Project Onramp, Forest Foundation, Massachusetts Life Sciences Center, and the Massachusetts Clean Energy Center.⁴⁷

HACK.DIVERSITY

[HTTPS://HACKDIVERSITY.COM/](https://hackdiversity.com/)

Hack.Diversity was launched by the New England Venture Capital Association in 2017 to increase the representation of Black and Latinx technical talent contributing to the innovation economy, and in doing so create ecosystem accessibility and economic upward mobility. From 2017 to 2019, it has run three cycles of its program, serving a total of 98 self-identified Black and Latinx candidates. The program offers three career tracks—Software Engineering, Information Technology,⁴⁸ and Data Analytics—and provides inclusive paid employment through an eight-month fellowship cycle for candidates entering the tech ecosystem through non-traditional pathways, including bootcamps, continuing education programs, and public two- and four-year colleges that serve higher shares of students of color than postsecondary education institutions as a whole. Hack.Diversity is currently working with 20 employer partners and seeks to increase that number to 25.

Candidates are selected through a rigorous application process. The program provides training, coaching, and mentoring for fellows and for corporate partners. The fellowship cycle has three phases of activity:

- Entry into the job market: Pre-fellowship workshops to set Fellows up for success at their internships
- Completion of internships: Paid summer internship, on-the-job coaching and training from managers and teams, support from mentors and alumni, opportunities to network with each other and partner companies

- Growth in the ecosystem: Access to alumni benefits such as resources, networks, employment opportunities, speaking opportunities, professional development, and leadership opportunities

Fellows participate in two workshops a month with concurrent tracks: professional polish and technical skills. The program continues to work with alumni to support the development of a robust network beyond the internship. The program also provides transportation support.

There is programming for employers in the eight-month cycle as well, including diversity, equity and inclusion workshops, networking, and training for coaching and mentoring employees. Employees at employer partners are also encouraged to serve in the Hack.Diversity Mentor Network. Each Fellow is partnered with a mentor during their fellowship. Employers pay the interns directly.

Hack.Diversity is focused on summer internships and retention in the technology ecosystem after the fellowship. They consider retention in the ecosystem post-program participation in three categories: 1) full-time job offers; 2) returning internship offers; 3) continued pursuit of higher education in STEM fields. After three completed cycles, 100% of Hack.Diversity Fellows are still working in the technology ecosystem or completing higher education degrees toward one of the three technical career tracks.

Looking ahead, Hack.Diversity is planning to increase the size of its cohort from 50 to 75, and is also considering branching out into additional geographic hubs in Massachusetts.

PROJECT ONRAMP

[HTTPS://PROJECTONRAMPMA.COM/](https://projectonrampma.com/)

Project Onramp was launched through a partnership among Life Science Cares, Mass Bio, MassBioEd Foundation, and Massachusetts Life Sciences Center to support students from underresourced backgrounds to find their first work experience in the biotechnology industry. Called the Life Science Scholars Program, the impetus for the program was feedback from nonprofit training and education partners who designed and delivered programming but hit a wall when it came to providing work experience, primarily because many companies require previous experience even for their newest employees. The program began in the summer of 2019 with the hiring of 52 students in paid summer internships—half in science and half in administrative positions. The company provides a job description and Project Onramp requests that the company hold the spot for students.

Project Onramp partners with Bottom Line as the exclusive source of students who apply to and are hired as interns. Bottom Line does the outreach, screens students and helps them prepare their resumes and do mock interviews. Companies use their existing review and hiring processes to select the student who best fits their needs. Job descriptions are often written by scientists and can be intimidating for students to understand without the support of their Bottom Line advisor. Bottom Line organizes a day-long internship bootcamp where topics include how to handle onboarding, asking questions, what to wear, and how to behave.

Students participate in paid internships for up to 12 weeks. Every other week in the summer, interns participate in a professional development or career skills workshop. Each workshop is focused on a topic—networking and mentorship, giving and providing feedback, career paths in life sciences. Workshops are led by CEOs, founders, and a variety of industry volunteers; these leaders share their insight and advice and network with students. This experience is intended to help students develop a network that they can tap into after their internship is over.

The program sends short surveys to supervisors every three weeks to gather information about how the intern is performing. This information is shared with Bottom Line to help staff target advising and support services for the interns. Bottom Line surveys students to gauge their satisfaction. The program will track where students are employed after their internship through Bottom Line.

In 2020, 37 interns interned at 22 companies (almost all remotely). Summer workshops were conducted via Zoom. Organizers plan for growth in 2021, including via cohorts outside of Boston/Cambridge. A critical element to expanding into other geographies will be to find an organization like Bottom Line to source and support students through the experience.

FOREST FOUNDATION

[HTTPS://FORESTFOUNDATION.NET/SUMMER-INTERNSHIPS/](https://forestfoundation.net/summer-internships/)

The Forest Foundation launched its internship program in 2007 to fund paid summer internships for students in local nonprofit organizations. These internships, along with venture grants to young leaders with new initiatives, and regional operating grants to new and emerging nonprofits serve the Forest Foundation's goal of cultivating the next generation of public service leaders. The Foundation supports 45–50 first-year summer internships and 10 second-year summer internships. Approximately one third of interns are at Boston colleges, one third are coming home to Boston from out-of-town colleges and one third come to Boston for the program. The preference is to hire juniors and seniors but there have been a few rising sophomores hired. In the last three years (2017–19), 175 interns were placed at Greater Boston nonprofits.

Students participate in a full-time 10-week internship at a nonprofit in Greater Boston and receive a \$6,000 stipend. (Housing stipends are not provided.) The internship experience includes adjacent programming as a cohort throughout the summer in areas like networking, skills workshops, reflections and professional development through five leadership and professional development days. Workshop topics include diversity and inclusion, grant-writing, leadership and social enterprise, civic engagement, philanthropy and nonprofit finance. Outside leaders from the nonprofit world are brought in to instruct and share their experiences in the sector. Professionals lead the workshops in grant writing and diversity and inclusion. There is a small group grant-writing project to secure a \$3,000–\$8,000 grant for a nonprofit partner.

The first two professional development sessions serve as an orientation and usually take place before the start of the internship. The staff work with the host sites beginning with a meeting in early May after interns are placed. They discuss best practices, mentoring, workplans; it is important that interns have the opportunity to do meaningful work and be productive members of the nonprofit team.

The Foundation seeks students who have significant community service experience; demonstrated leadership skills; and passion for community issues, public work, and the nonprofit world. The Foundation markets through college consortiums, career service websites and databases. Many interns come from smaller liberal arts colleges, and college community services offices are often the point of contact. The application is available December 1 with a February 15 deadline and rolling acceptance through March. Applicants are interviewed in-person or remotely by the Foundation and the host organization. Students complete five or six essay questions; they are not asked for grades or a resume.

Most of the nonprofit hosts are in Greater Boston, support at-risk and underserved populations, and operate on budgets less than \$500,000. The Foundation looks for nonprofits that are excited to have a young person on the team and are committed to providing them with the attention and support

they need to succeed. These nonprofits are looking for the chance to complete projects and train new students who might end up going into nonprofit careers.

The Foundation is not planning to scale the program. It has found that 45–50 students is the right size for a cohort experience. When the cohort is larger it is more of a lecture experience and less interactive.

MASSACHUSETTS LIFE SCIENCES CENTER INTERNSHIP CHALLENGE (MLSC)

[HTTPS://WWW.MASSLIFESCIENCES.COM/PROGRAMS/INTERNSHIP-CHALLENGE/](https://www.masslifesciences.com/programs/internship-challenge/)

The Life Sciences Center’s internship program, the Internship Challenge, was launched in 2009. It is offered year-round, running from May 1 to April 30, and companies can hire an intern at any point throughout the year, typically for a 12-week period. Participating companies can hire interns who are enrolled at Massachusetts postsecondary schools or who are residents of Massachusetts and are enrolled in colleges outside of the state. The internship program serves small and medium-sized companies, with 100 or fewer employees in Massachusetts and no more than 250 employees globally. Eligible companies are reimbursed for intern wages up to \$17/hour, not exceeding \$8,160 per intern per year. Companies can hire two interns in a year or up to four interns if two of those interns are community college students.

In the 2019–20 Program Year, MLSC funding enabled the creation of 513 internship opportunities at 286 different companies throughout the Commonwealth. Students participating in the program represented 106 different academic institutions. Since inception, the program has supported more than 4,600 internships with more than 800 organizations, for students from 240 colleges and universities.

MLSC is a facilitator and a funder. Through an online platform, companies are able to access a searchable database of prospective interns to identify qualified candidates. Companies reach out directly to students, interview and hire them. MLSC does not play a role in the matchmaking process, but staff regularly engage Massachusetts academic institutions to promote the program and encourage students to apply. The most successful colleges have faculty and career services staff working with students on their applications and advocating on their behalf with industry leaders.

Students apply online for an internship opportunity, but do not see job descriptions or apply to work for a specific company. When an intern is hired the company notifies the MLSC and signs an agreement. The company is required to provide an offer letter that is signed by the student. The duration and hours are flexible; the internship can be full-time or part-time and the pay rate is determined by the company. At the conclusion of the internship, the company requests reimbursement for wages paid to the student.

The MLSC tracks the following metrics: student educational background and demographics, company information, and whether interns are hired post-internship. Since 2019, 21% of interns have been hired either full or part-time following their internships.

In 2020, the MLSC piloted an Advanced Analytics/Data Science Internship Program, which responds to the growing demand for data science talent in the life sciences. Companies can hire one subsidized intern per year for up to six months, which counts toward the limit on interns hired through the Internship Challenge. MLSC will reimburse up to \$20/hour for interns who are pursuing or have completed their bachelor’s degree (up to \$20,800 per intern), \$25/hour for interns who have completed their master’s degree (up to \$26,000 per intern), and \$40/hour for interns who have completed their Ph.D. (up to \$41,600 per intern). By providing real-world opportunities for students and graduates to explore life sciences

careers, the program seeks to increase the availability of data science talent needed to advance the development of novel techniques for data mining in strategic areas to accelerate biomedical research.

MASSACHUSETTS CLEAN ENERGY CENTER

[HTTPS://WWW.MASSCEC.COM/CLEAN-ENERGY-INTERNSHIP-PROGRAM](https://www.masscec.com/clean-energy-internship-program)

The Clean Energy Center's Internship Program was launched in 2011. The program supports summer and academic year internships for students who are residents of Massachusetts or matriculating at a Massachusetts college. Students can participate in an internship for 12 weeks in the fall, spring or summer. They can work 20 hours/week in the fall and spring and 40 hours in the summer. The Clean Energy Center hosts a symposium once a year for interns with workshops and guest speakers from the industry. MCEC staff do outreach to students through colleges and faculty. The college works with students on their application and resume and follow-up with potential employers. The internship program supported 613 interns in Fiscal Year 2019 with a budget of \$3.5 million. The MCEC will reimburse companies up to \$16/hour.

The Clean Energy Center has a database on which employers can enter a job description, which triggers the CEC to provide them with an access code to search the database of student resumes. When an employer has chosen a student, they send CEC an email so that the CEC can confirm that the student is in college and whether they are a graduate or undergraduate. The employer pays the wage and the intern is on the employer's payroll. The CEC requires a minimum wage of \$15/hour and will reimburse up to \$16/hour.

Many of the companies that hire interns are small businesses and start-ups; 83% have 25 or fewer employees. Companies can hire two interns per year; if one of the interns is a community college student, the company can hire three interns per year.

The Clean Energy Center tracks race, gender, college, major, graduate or undergraduate, pay level and whether the intern is hired. Companies complete a survey at the end of the internship; the survey is required in order for the company to be paid. To date more than 800 students have been hired (20% of all interns) but it is difficult to track hiring for students who are not seniors when they do their internship.

MASSACHUSETTS TECHNOLOGY COLLABORATIVE

Since 2013, the MassTech Intern Partnership has provided more than \$2.3 million to support nearly 800 summer interns at 320 tech firms statewide. The program provides matching grants to eligible tech companies to partially reimburse intern salaries. After a company recruits an intern the company must apply to the program through the Mass Tech website. The company signs an internship agreement, which is required in order to seek reimbursement. Companies can apply for up to two interns per program period—May 1 through September 30. Companies in priority areas of cybersecurity, digital health, fintech, the Internet of Things (IoT) and robotics may apply for up to three interns.

Companies must pay a minimum hourly wage of \$12.75/hour. MTC will reimburse up to 50% of the intern's hourly wage up to \$8 per hour for a total of \$3,200/year per individual intern. Companies must be headquartered or have operations in Massachusetts and have fewer than 100 employees globally. Interns must be Massachusetts residents currently enrolled or a recent graduate of a two- or four-year college or university. In 2019, 200 interns were employed at 112 Massachusetts firms, and in 2020, 129 interns were employed at 70 start-ups across the state.

Endnotes

1. McLaughlin, Joseph and Van Eaton, Anika. (2018). *Staying the Course: Six-Year College Enrollment and Completion Experiences of BPS Class of 2011 Graduates*. The Boston Foundation.
2. Burning Glass Technologies and Strada Institute for the Future of Work (2018). *The Permanent Detour: Unemployment's Long-Term Effects on the Careers of College Grads*; Federal Reserve Bank of New York (2020). *The Labor Market for Recent College Graduates*, <https://www.newyorkfed.org/research/college-labor-market/index.html>.
3. Bartik, Timothy J., and Brad Hershbein. (2016). "Degrees of Poverty: Family Income Background and the College Earnings Premium." *Employment Research* 23(3): 1-3. [https://doi.org/10.17848/1075-8445.23\(3\)-1](https://doi.org/10.17848/1075-8445.23(3)-1); Upjohn Institute. March 4, 2016. Research Highlight: College Grads Earn Less if They Grew Up Poor <https://www.upjohn.org/research-highlights/college-grads-earn-less-if-they-grew-poor>
4. Guvenen, Fatih and Karahan, Fatih, and Ozkan, Serdar, and Song, Jae (2015). *NBER Working Paper Series: What Do Data on Millions of U.S. Workers Reveal About Life-Cycle Earnings Risk*. National Bureau of Economic Research; Burning Glass Technologies and Strada Institute for the Future of Work (2018). *The Permanent Detour: Unemployment's Long-Term Effects on the Careers of College Grads*.
5. A number of definitions of good first jobs rely on the percentage of those employed in an occupation that have a bachelor's or higher degree. This same approach cannot be applied to measuring good first jobs for associate degree holders, as there are few occupations that have a majority of those employed holding an associate's degree.
6. McLaughlin, Joseph and Van Eaton, Anika. (2018). *Staying the Course: Six-Year College Enrollment and Completion Experiences of BPS Class of 2011 Graduates*. The Boston Foundation
7. Although the research base on the labor market outcomes of college graduates from public high schools in Boston is limited, a recent Brown University study examined early labor market outcomes for public high school graduates in Massachusetts, and the influence of MCAS scores and educational attainment on earnings gaps across student groups, see: Papay, John, and Mantil, Ann, and Murnane, Richard, et al., *Lifting All Boats? Accomplishments and Challenges from 20 Years of Education Reform in Massachusetts* (2020), Brown University
8. Graduates of Boston Latin and Boston Latin Academy, two examination schools which serve a significantly smaller proportion of low-income students and students of color than the other Boston high schools, were excluded from all school-level analyses. However, a small number of low-income graduates of these two examination schools (41 students) are included in the Bottom Line sample of 248 Boston four-year college graduates served by the organization. (See description of Bottom Line sample in the next section of the report.)
9. Bureau of Labor Statistics. Civilian Labor Force and Unemployment by Selected Metropolitan Area, Seasonally Adjusted. <https://www.bls.gov/web/metro/ssamatab2.txt>
10. Burning Glass Technologies. (2020) "Labor Insight™ Real-Time Labor Market Information Tool." [Comparison of Boston Metropolitan Area job postings for the periods April–Dec 2019 and April–Dec 2020 that advertised for a bachelor's degree and 0–2 years of experience]. <https://laborinsight.burning-glass.com/us#> Retrieved 01/25/2021.
11. Altonji, Joseph G, and Kahn, Lisa, and Speer, Jamin (2016). "Cashier or Consultant? Entry Labor Market Conditions, Field of Study and Career Success." *Journal of Labor Economics* vol.34, issue S1, S361-S401; Schwandt, Hannes (April 2019). *Policy Brief: Recession Graduates: The Long-Lasting Effects of an Unlucky Draw*. Stanford Institute for Economic Policy Research.
12. Friedman, Gillian. "Here's What Companies Are Doing to Fight Racism." *New York Times*, Aug 23, 2020. <https://www.nytimes.com/article/companies-racism-george-floyd-protests.html>
13. Burning Glass Technologies and Strada Institute for the Future of Work (2018). *The Permanent Detour: Unemployment's Long-Term Effects on the Careers of College Grads*; Federal Reserve Bank of New York (2020). *The Labor Market for Recent College Graduates*, <https://www.newyorkfed.org/research/college-labor-market/index.html>.

14. The seven public universities included in the report are Bridgewater State University, Framingham State University, Salem State University, UMass Amherst, UMass Boston, UMass Dartmouth, and UMass Lowell. These public universities account for 49% of four-year college enrollments for students who graduated in 2017 and 2018 from one of the district's non-exam schools or the O'Bryant School of Mathematics and Science, which together serve the vast majority of the district's low-income students and students of color.
15. Marcus, Jon (Dec 25, 2020). "Shopping for a major? Detailed salary info shows which majors pay off. Colleges say kids don't always make a 'rational choice,' but think that might be changing." Hechinger Report. <https://hechingerreport.org/more-info-is-available-about-which-majors-pay-off-but-students-arent-using-it/>
16. These colleges are (as of the date of publication) Bentley University, Boston College, Boston University, Bridgewater State University, Clark University, Fitchburg State University, Framingham State University, The College of the Holy Cross, Lesley University, Northeastern University, Salem State University, Suffolk University, UMass Amherst, UMass Boston, UMass Dartmouth, UMass Lowell, Wentworth Institute of Technology, and Worcester State University
17. The response rate for this survey was 86%, with 248 of its 288 Boston graduates completing the survey.
18. Thirty-five percent (35%) of the students in the Bottom Line sample are African American; 35% are Asian; and 25% are Hispanic.
19. Bottom Line did not disaggregate data on Boston graduates before 2018; thus the need to look at the combined cohort of Boston and Worcester graduates for trend analyses.
20. <https://collegescorecard.ed.gov/>
21. U.S. Department of Education. *Technical Documentation for Data Files by Field of Study*, <https://collegescorecard.ed.gov/data/documentation/>
22. The seven local public universities are Bridgewater State University, Framingham State University, Salem State University, University of Massachusetts Amherst, University of Massachusetts Boston, University of Massachusetts Dartmouth and University of Massachusetts Lowell. These public universities account for 49% of four-year college enrollments for students who graduated in 2017 and 2018 from one of the district's non-exam schools or the O'Bryant School of Mathematics and Science, which together serve the vast majority of the district's low-income students and students of color. Although some Boston-area private institutions also enroll significant numbers of BPS graduates, the overall demographic composition of their student body is less similar to that of the BPS student population.
23. Among the seven public universities included in the study, UMass Boston is the only school in which students of color comprise the majority of undergraduates. Sixty percent (60%) of UMass Boston undergraduates are students of color. In contrast, less than 40% of the undergraduate student population are students of color in the other six public universities. UMass Boston also serves a large number of low-income students, as indicated by the high percentage of undergraduates receiving federal Pell grants (47%). Only Salem State has a higher percentage of Pell grant recipients (51%). Source: College Navigator Website of National Center for Education Statistics (NCES), <https://nces.ed.gov/collegenavigator>. 2018-2019 enrollment and financial aid data by college.
24. Bottom Line provided salary data for a sample of 133 of its 2018 college graduates who were working in full-time permanent positions approximately six months after completing their bachelor's degree. Eighty-four percent (84%) of the sample attended BPS high schools, 7% attended local charter schools, and 8% attended other Boston area public and private schools. Data on average starting salaries of 2018 New England region four-year graduates working full time came from the National Association of Colleges and Employers (NACE) annual salary survey. National Association of Colleges and Employers (2019). *Summer 2019 Salary Survey*.
25. The College Scorecard data also closely tracked the earnings results for Bottom Line graduates. The median earnings of Bottom Line graduates from the seven public colleges included in the study was \$40,000 compared to \$42,000 for all graduates of these institutions receiving financial aid.
26. Burning Glass analysis of job postings data for 2019 in the Boston metro area found that 49% of entry-level postings in science-related occupations requested an advanced degree as the minimum or preferred credential.
27. U.S. Department of Education, College Scorecard Data, <https://collegescorecard.ed.gov/data/>
28. In 2019, 66% of the students attending the O'Bryant School of Mathematics and Science were of African American or Latinx descent compared to 46% and 21% of students attending Boston Latin Academy and Boston Latin School, respectively. Forty-six percent (46%) of students attending the O'Bryant were classified as low-income compared to 32% of Boston Latin Academy students and 16% of Boston Latin School students.

29. Burning Glass analysis of advertised majors in job postings requesting a bachelor's degree and 0–2 years of experience in the Boston metro area in 2019.
30. Burning Glass Technologies and Strada Institute for the Future of Work (2018). *The Permanent Detour: Unemployment's Long-Term Effects on the Careers of College Grads*; Federal Reserve Bank of New York (2020). *The Labor Market for Recent College Graduates*.
31. The Boston Planning and Development Agency (2019), Boston's Economy, 2019 and Bureau of Labor Statistics, National and Metropolitan Area Employment and Unemployment, Dec 2015 and Dec 2019.
32. Nursing graduates were excluded from the internship analysis, as they are required to complete clinical rotations. Education majors were similarly excluded, because student teaching is a typical source of career-qualifying workplace experience.
33. Crain, Andrew. 2016. "Understanding the Impact of Unpaid Internships on College Student Career Development and Employment Outcomes;" NACE Foundation Report; National Association of Colleges and Employers (2019). *Executive Summary: The 2019 Student Survey Report*. Retrieved from <https://www.naceweb.org/uploadedfiles/files/2019/publication/executive-summary/2019-nace-student-survey-four-year-executive-summary.pdf>.
34. Ibid
35. <http://profiles.doe.mass.edu/statereport/gradsattendingcollege.aspx>
36. The authors tabulated the share of BPS graduates attending in-state, four-year colleges and universities, based on National Student Clearinghouse (NSC) enrollment data.
37. While there may be some small programs that we missed in our scan of organizations, it's reasonable to assume that our estimate approximates the magnitude of the unmet need.
38. The industry-based internship programs served fewer students than planned in the summer of 2020 during the COVID-19 pandemic, with most of the internships being remote
39. Burning Glass Technologies and Strada Institute for the Future of Work (2018). *The Permanent Detour: Unemployment's Long-Term Effects on the Careers of College Grads*; Federal Reserve Bank of New York (2020). *The Labor Market for Recent College Graduates*, <https://www.newyorkfed.org/research/college-labor-market/index.html>.
40. <https://collegescorecard.ed.gov/data/>
41. <https://careers.northeastern.edu/experiential-network/>
42. In the 2018 study, *The Permanent Detour: Unemployment's Long-Term Effects on the Careers of College Grads*, Burning Glass Technologies and the Strata Institute for the Future of Work defined a BA-level occupation as one in which at least 50% of the national job postings for the occupation requested a bachelor's degree. The Federal Reserve Bank of New York's ongoing analysis of the labor market for recent college graduates, which uses data collected by ONET through surveys of incumbent workers, defines a BA-level occupation as one in which 50% or more of the people working in that job indicate that at least a bachelor's degree is necessary. Unlike posting data, which reflects current requirements advertised by employers, the education data collected by ONET for specific occupations can be several years old before it is updated (<https://www.newyorkfed.org/research/college-labor-market/index.html>).
43. <https://www.bottomline.org/content/success-program>
44. Bottom Line, "Get In. Graduate. Go Far" Description of Career Connections Program Model
45. Ibid
46. Salem State University was selected over Framingham State University based on 2016 BPS non-exam school college enrollment data, the most recent data available when the college sample was selected. For that BPS graduation cohort, Salem State was second to Bridgewater State in state university enrollment.
47. The Greater Boston Chamber of Commerce piloted a college internship program to increase opportunities for students of color using a skills-based matching platform in the summers of 2019 and 2020.
48. Hack.Diversity is considering phasing out IT and developing more of an engineering pathway for students.

