Preparing All Students for Economic & Career Success

An External Assessment of Career Readiness Priorities, Practices, and Programs in Baltimore City Schools

May 2019

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Executive Summary

For generations, good jobs that provided stability and family-sustaining wages were accessible to most individuals provided they had a high school diploma; but significant economic shifts—including those stemming from technological advancements and the Great Recession—have upended this reality. The ripple effect of those seismic changes within our economy has greatly expanded some career options, eliminated others, and transformed the role of postsecondary education as a necessity in securing employment with family-sustaining wages.

Today, all students require some level of postsecondary education and training to access good jobs. The bifurcated path to economic prosperity—in which students choose a college-track or a career-track—no longer exists, as ninety-nine percent of all jobs created in the recovery of the Great Recession required some level of postsecondary education and training.[1] Students must be prepared to succeed in higher education to access good jobs; and they must be able to apply advanced academic, technical, and professional skills to be successful in the workplace.

Despite college readiness and career readiness being more tightly linked than ever before, there is still not a one-size-fits-all approach to prepare students for this new economic reality. There are many pathways a student can take to achieving prosperity: In fact, it is estimated that the economy will demand roughly the same number of associate degrees as bachelor degrees.[2] The task of K-12 educators now is to ensure that <u>all</u> students connect to a pathway that both aligns with their individual goals <u>and</u> prepares them for rigorous college and career opportunities.

In response to this need and with generous support from the Abell Foundation, Baltimore City Public Schools (City Schools) contracted with Education Strategy Group (ESG) to examine its current career readiness programming and identify opportunities to strengthen and scale high-quality programs for all students.

ESG's study was guided by the following principles:

- Career readiness refers to a broad range of rigorous opportunities that integrate career-aligned technical skills, core academic skills, and professional skills to prepare students for college and career. Career and Technical Education (CTE) is one of many offerings within this framework schools can implement to achieve these goals.

- High-quality career readiness programming must:

[1] Carnevale, Anthony et al. 2016. *America's Divided Recovery: College-Haves and Have-Nots*. Georgetown Center on Education and the Workforce: Washington, DC: <https://cew.georgetown.edu/cew-reports/americas-divided-recovery/#full-report>

[2] Carnevale, Anthony et al. 2013. *Recovery: Job Growth and Education Requirements through 2020*. Georgetown Center on Education and the Workforce: Washington, DC. <https://cew.georgetown.edu/cew-reports/recovery-job-growth-and-education-requirements-through-2020/#full-report>

- o Be aligned to in-demand, high-skill, high-wage opportunities in the surrounding labor market;
- o Culminate in high-value credentials as appropriate that connect students to good jobs;
- o Embed rigorous academic coursework, including opportunities to earn relevant early postsecondary credit in a degree program through partnerships with local postsecondary institutions;
- o Have the support of the local business community, who partner with districts to host industry-aligned work-based learning experiences and advise on programmatic decisions through industry councils or like groups;
- o Be supported by strong career advisement that accounts for each student's individual college and career goals;
- o Be accessible to all students and provide support strategies to prepare students for credit-bearing college coursework and the skills demanded of our 21st century economy.

To make its recommendations, ESG conducted a mixed methods analysis, including: multiple stakeholder interviews with Baltimore's education and workforce leaders; focus groups and surveys of teachers, counselors, and students; and a data analysis of existing career program performance data. The findings and recommendations from this work are presented below. While the recommendations presented in this report are intended to be comprehensive, ESG acknowledges that no district can take on all of these recommendations at once. City Schools should review these recommendations closely and identify which components it can and should address in the near future, and which will require additional resources, capacity, or partnerships in order to achieve in the longer-term.

Labor Market Alignment

Findings
The alignment of City Schools' career program offerings to Baltimore's priority industries is mixed. While City Schools offers a career cluster aligned to each of the city's six priority industries—advanced manufacturing, business administration and management, construction trades, healthcare and biosciences, information technology (IT), and transportation services (especially port services)—enrollment patterns do not favor these priority areas. While some of these priority clusters—particularly Health and Biosciences, IT, and Manufacturing, Engineering, and Technology—are well-enrolled, others suffer from low enrollment rates, meaning students miss out on early access to well-paying jobs and employers lack a strong talent pipeline to draw from within the city. Additionally, City Schools offers career clusters that are not aligned to any of these six priority industries, many of which—specifically Career Research and Development and Human Resource Services—consistently enroll large numbers of students.

Recommendations
To ensure that all students are prepared for careers that can support families and offer opportunities to advance, City Schools should offer and prioritize programs of study that are aligned to Baltimore's priority occupations.

- **Identify** the highest-value occupations within each of the six priority industries, in partnership with the Mayor's Office of Employment Development (MOED).

- **Map** the alignment of individual programs of study to these priority occupations.

- **Build and scale** those programs of study that are aligned to priority occupations, **transform** those that can be brought into alignment, and **phase out** unaligned programs (or, at minimum, reduce their number and increase the rigor of remaining programs).

- **Leverage** the expertise of business leaders participating in the Local Advisory Committee to scale and transform programs.

Quality and Rigor of Programs of Study

Findings
High-quality, rigorous career programming should include opportunities for students to undertake advanced coursework, complete aligned work-based learning experiences, and earn relevant early postsecondary credit and/or industry-recognized credentials to further their training and experience. **While there are examples of programs that incorporate some of these elements, they are the exception and not the rule; and no program of study currently offers <u>all</u> of these elements.**

Industry-recognized credentials are embedded within every career cluster, though fewer than half offer meaningful value in the labor market—either as a direct signal to employers of skill attainment or as a stepping-stone to advanced credentials. In fact, only about 10 percent of offered credentials connect students to jobs that pay family-sustaining wages. Dual enrollment opportunities exist in the district, though they are not embedded within any career program of study; and existing articulated credit opportunities for career programming are underutilized. Students complete work-based learning, but they are connected to these experiences on an ad-hoc basis, frequently led by individual teachers.

Recommendations
Career readiness programs must be more than a sequence of secondary-level elective courses. To best prepare students for college and career success, programs of study that are aligned to high-value occupations should incorporate experiences that will expedite students' advancement along their chosen pathway.

- **Develop and implement** a plan to ensure that every career readiness program culminates in either relevant early postsecondary credit in a degree program and/or an industry-aligned credential.

- **Study** the barriers to student participation in dual enrollment and **determine** whether dual credit should be considered as an alternative model to bring early postsecondary opportunities to high school campuses.

- **Systematize** the way in which articulation agreements are enacted and used and clearly **communicate** these opportunities to students and families.

- **Use** labor market information to determine which industry-recognized credentials are high-quality enough to be embedded within priority programs of study.

Equity in Access and Outcomes

Findings
ESG found that **the most rigorous programs in career clusters aligned to Baltimore's six priority industries are located in City Schools' highest-performing schools**. Many of these schools have general admissions requirements that act as a barrier to participation for students who may be interested in the career program, but whose academic history disqualifies them from school admission. **At the same time, career clusters that frequently connect to lower-level job opportunities are concentrated in schools with lower academic achievement.**

ESG examined program equity in terms of both placement—where programs exist throughout the district—and student participation and outcomes by gender, race, and special population status. While City Schools can and should boast impressive growth in CTE enrollment (CTE enrollment increased 3% between school years 2014-15 and 2017-18, while overall district enrollment *declined* approximately 5%), equity gaps in student participation persist—though many of these gaps followed familiar national patterns, such as female students being over-subscribed in programs within the Consumer Services and Health and Biosciences clusters. Other student-level gaps, such as the over-subscription of students with disabilities in unaligned programming such as Career Research and Development, are exacerbated by significant gaps in program placement across the district.

<u>Recommendations</u>
<u>All</u> students should have access to programs of study that lead to in-demand, high-skill, high-wage careers—not just students who meet or exceed the academic entrance requirements at selective high schools or demonstrate proficiency in core academics. Rather than creating barriers to entry to these high-value programs, City Schools should encourage more students to participate in them and build academic supports to help them succeed. In fact, done right these programs of study could become strategies to build students' academic skills and prepare them for the rigors of college and the workplace. To improve equity in access to priority programs of study, City Schools must offer them in more schools and change its approach to student placement into programs of study.

Program Distribution

- **Place** each of the identified priority programs of study in at least one open-enrollment high school in both the east and west sides of the district, where start-up costs and equipment needs are not prohibitive.

Student Advisement

- **Use** existing tools like Naviance to their full capabilities to provide individualized advisement to all middle school students. This includes extending beyond the college exploration and planning features to include opportunities to identify career interests and personal goals and explore information about the in-demand, high-skill, high-wage job opportunities aligned to those interests and goals.

- **Build** counselor capacity to create and provide structured guidance for middle school students that helps them make decisions about high school by unpacking City Schools' choice system, explaining the range of programs available at each high school, and highlighting the programs that may be of most interest to each student.

- **Provide** counselors with the professional development needed to advise students on the variety of rigorous postsecondary options available to them.

- **Develop and implement** a structured, systematic process—led by City Schools College and Career Readiness Division staff—to enroll students in programs of study. This work should be informed by each student's long-term career and education goals; and students should have the right to opt into—and out of—programs at any time.

Student Achievement

<u>Findings</u>
Based on ESG's analysis, school selection is the driving force behind student achievement outcomes. **Across the district, students—including those enrolled in CTE—are struggling to meet college-ready benchmarks on**

assessments like the PARCC; and those who do meet these benchmarks are concentrated in a handful of high-performing schools. This trend is even more stark among CTE students, who in the 2017-18 school year were about half as likely to meet the English Language Arts (ELA) or mathematics benchmarks (ELA 11 and Algebra II, respectively); and the overwhelming majority of those who did were enrolled at one of two schools. Despite college-readiness gaps between CTE students and the larger student body, CTE students' college enrollment keeps pace with the overall district enrollment rate. Once again, the largest variations observed appear to be the product of school choice and overall school quality.

<u>Recommendations</u>
Proficiency is needed for <u>all</u> students to succeed in both credit-bearing college coursework and careers that are in-demand, high-skill, and high-wage. To ensure that all students are prepared for success, City Schools should leverage rigorous programs of study as an additional strategy to support and reinforce academic proficiency by applying core academic skills to solve real-world problems.

- **Embed** the promising speed-up/catch-up strategies—including transitions coursework curriculum—already in place throughout the district into each program of study to support student proficiency in math and English and build college readiness skills.

- **Provide** CTE teachers professional development opportunities that focus on strategies for embedding academic supports within instruction to reinforce core skills.

- **Develop** strategies for connecting core academic teachers with CTE instructors for integrated instructional planning.

Employer Engagement

<u>Findings</u>
ESG convened a focus group of local business leaders—including, but not limited to, current Local Advisory Committee (LAC) members—to better understand barriers to employer engagement with City Schools. Promising practices were raised in conversation, including a nascent partnership between City Schools and the Mayor's Office of Employment Development (MOED) to organize a job fair inclusive of high school youth; and many employers voiced a desire to work more deeply with City Schools, either as a work-based learning host and/or in a program advisory capacity. Currently, however, the active LAC is not leveraged in shaping career readiness decisions or setting up a comprehensive work-based learning strategy. Beyond these structural limitations, **student readiness for professional workplace settings is a challenge that has been observed by employers and teachers alike, with many students lacking the critical professional skills—such as professional communication and time management—and fundamental academic skills to thrive on the job**.

<u>Recommendations</u>
Building robust, high-quality career readiness programming is not a task for City Schools to take on alone. This work must be done in partnership with industry experts and include opportunities for students to apply their skills to real-world problems.

- **Expand and formalize** a partnership with MOED, and explore additional partnerships with other workforce intermediaries, to build—and ultimately scale—a district-wide work-based learning program, with the goal of making an industry-aligned internship available to at least all students concentrating in a priority program of study.

- **Adopt** a professional skills curriculum and **embed** it within priority programs of study to better prepare students for immersive work-based learning opportunities.

- **Design and implement** a progressive continuum of work-based learning experiences, extending from early job exploration in middle school to internships and direct work experiences for high school students.

- **Investigate** alternative forms of rigorous work-based learning to overcome significant barriers for students, like transportation, in partnership with MOED.

District Vision and Capacity

Findings

City Schools' strategic plan, *Building a Generation: City Schools' Blueprint for Success*, presents a comprehensive strategy for supporting students that rests on three pillars: student wholeness, literacy, and staff leadership. While this vision touches on many of the key elements necessary for strong career readiness programming, the City Schools teachers and counselors that participated in focus groups observed that **the *Blueprint* does not directly address career readiness or leverage CTE as a strategy to achieve its stated priorities**.

Additionally, many focus group participants—particularly employers and current CTE teachers—expressed a desire for a district-wide and district-led process to systematize key program components like work-based learning and industry partnership. Finally, ESG observed a significant challenge in collecting data on career programs and using that data to more fully incorporate career readiness into the district's strategic planning process. Challenges in defining, tracking, and storing important program metrics—specifically CTE concentration and completion, work-based learning participation, and articulated credit awards—limit the City Schools' ability to fully and consistently monitor its programs for quality.

Recommendations

High-quality career readiness programs cannot exist without strong leadership support and oversight—and leaders cannot drive this work without accessible, accurate data to track program quality and student success within programs.

- **Establish** career readiness as a visible district priority and show how it fits within the *City Schools' Blueprint For Success*.

- **Ensure** career readiness becomes a cross-division priority, led by City Schools' college and career team but embedded in and supported by other divisions as well.

- **Build** a robust student information system to collect all student data—including career program performance data—in a single repository to increase accuracy and access to critical metrics.

Economic Opportunity in Baltimore City

A Shifting National Landscape

Across the country, the pathway to economic security and self-sufficiency looks far different than it once did. For generations of Americans, the transition from education to the workforce was fairly straightforward: A high school diploma was enough to land a stable blue- or white-collar job that paid well; and a college education in nearly any field only enhanced that prosperity. Significant economic shifts—spurred both by rapid technological advancement and the downturn of the Great Recession—have fundamentally altered the reality of education and work.

According to a study by the Center on Education and the Workforce (CEW), the Great Recession largely eliminated the blue-collar and white-collar clerical jobs traditionally available to high school graduates, replacing them with higher-skill managerial or professional roles. Of the jobs created during the recovery, 99% went to workers with some level of postsecondary education and training.[3] The industries in which these jobs are concentrated are also changing, with information technology (IT), healthcare, and business management constituting a large share of new jobs created post-recovery. Even among traditional industries, such as manufacturing and the skilled trades, the same jobs that were once accessible with a high school diploma now require new, advanced skills and training.

The economy has changed, and the rules of education have changed with it. Postsecondary education is now practically a requirement to access good jobs—but a bachelor's degree is not. Though at a high level, earnings increase as educational attainment increases, closer examination reveals that the value of college degrees and majors varies according to alignment to the labor market. Not all degrees are created equally, and sometimes less education is worth more. For example, an associate's degree in a STEM field (science, technology, engineering, mathematics) pays an average of $60,000 per year, while a bachelor's degree in the humanities and liberal arts pays an average of $53,000 per year.[4]

In fact, over one-quarter (28%) of associate's degree holders and many professionals with one-year certificates earn more than workers with bachelor's degrees; and many well-paying jobs are open to these individuals across the country.[5] Georgetown CEW estimates that there are 30 million jobs that pay over $35,000 per year and require less than a bachelor's degree, of which 16 million pay $55,000 or more.[6] Even accounting for regional variation in cost of living, there are millions of good jobs for sub-BA workers: A recent Brookings Institution study of the top 100 metropolitan areas found 11.9 million jobs that pay more than the local

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[3] Carnevale, Anthony et al. 2016. *America's Divided Recovery: College Haves and Have-Nots*. Georgetown Center on Education and the Workforce: Washington, DC. <https://cew.georgetown.edu/cew-reports/americas-divided-recovery/#full-report>

[4] Carnevale, Anthony and Ban Cheah. 2018. *Five Rules of the College and Career Game*. Georgetown Center on Education and the Workforce: Washington, DC. <https://cew.georgetown.edu/cew-reports/5rules/>

[5] Ibid.

[6] Carnevale, Anthony et al. 2017. *Good Jobs that Pay without a BA*. Georgetown Center on Education and the Workforce: Washington, DC. <https://goodjobsdata.org/wp-content/uploads/Good-Jobs-wo-BA-final.pdf>

median wage and require less than a bachelor's degree.[7] This is the new normal for American workers. Achieving economic prosperity requires more education, but there are also many more pathways workers can take to get there, from apprenticeships and non-degree credentials to associate's and bachelor's degrees.

Opportunity in Baltimore

In some respects, Baltimore is a tale of two cities: It is at once a city of promising economic opportunity and deeply rooted intergenerational poverty. While economic projections depict Baltimore City as a city on the rise, many of its residents do not share in and benefit from this prosperity.

It is undeniable that overall economic conditions in the Baltimore region are improving. Over the last 20 years, the population has steadily increased (increasing by approximately 400,000 since 1998); GDP has grown 95.5%; and personal income is up 51.5%. Though the retail sector took a severe hit during the Great Recession, the economy has been bolstered both by longstanding institutions—like the Port of Baltimore, which is responsible for nearly 34,000 jobs across the state and 13,000 jobs in Baltimore City itself—and newer business.

Increasingly, start-ups and federal government services (particularly information technology and scientific research and development) are also making a home in and around Baltimore. [8] Of the career opportunities that offer Baltimoreans the most direct path toward economic prosperity, most fall into one of six industries: Advanced Manufacturing, Business Administration and Management, Construction, Healthcare and Biosciences, Information Technology (IT), and Transportation.

In-Demand, High-Skill, High-Wage Industries in Baltimore
Advanced Manufacturing
Business Administration & Management
Construction Trades
Healthcare and Biosciences
Information Technology
Transportation Services

Baltimore's economy is shifting toward a more prosperous future, yet this prosperity is not realized in the homes of many of the city's residents. In fact, much of the growth remains concentrated in the surrounding region, rather than in Baltimore City itself; and while population has been steadily increasing in the region, Baltimore City has been losing residents across the same time period. Those who remain in the city face steep, uphill challenges to moving out of poverty and up the economic ladder: Merely growing up from birth in Baltimore City with parents who earn less than the median income reduces a child's own income in adulthood by 14%.[9]

Currently, Baltimore City is home to approximately 18,000 youth who are neither in school nor employed, resulting in a youth disconnection rate of nearly 20%—the second highest in the country. Though most of these youth have reached a significant milestone—earning a high school diploma—they have either no postsecondary experience or only some college experience. Those that are employed are often working in low-wage jobs: In 2013, nearly three-quarters (70.9%) of employed youth aged 16 to 24 earned an hourly wage of $12.96 or less.[10] In short, these youth are stepping out of high school with no clear path to prosperity before them or economic supports to guide them.

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[7] Shearer, Chad and Isha Shah. 2018. *Opportunity Industries: Exploring the Industries that Concentrate Good and Promising Jobs in Metropolitan America*. Brookings Institution: Washington, DC. <https://www.brookings.edu/wp-content/uploads/2018/12/2018.12_BrookingsMetro_Opportunity-Industries_Report_Shearer-Shah.pdf>

[8] Greater Baltimore Committee and Baltimore Metropolitan Council. 2018. *Greater Baltimore State of the Region Report*. Greater Baltimore Committee and Baltimore Metropolitan Council: Baltimore, MD. Accessed June 20, 2018.

[9] Chetty, Raj and Nathaniel Hendren. 2016. "The Impacts of Neighborhoods on Intergenerational Mobility II: County-Level Estimates." NBER Working Paper No. 23002, Revised Version May 2017.

[10] Field Guide Consulting. 2016. *Connecting Baltimore's Opportunity Youth to Careers*. Job Opportunities Task Force and Baltimore's Promise: Baltimore, MD. <https://jotf.org/wp-content/uploads/2018/06/Connecting-Baltimore-Opportunity-Youth-to-Careers_022316.pdf>

Career readiness programming that begins in middle and high school (or even earlier) can clarify these pathways for students—and ultimately create more equitable economic outcomes across a city. When done well, career readiness efforts that leverage strong Career and Technical Education (CTE) create a pipeline from K-12, to postsecondary education and training, to career—connecting youth to in-demand, high-skill career opportunities that pay family-sustaining wages. With generous support from the Abell Foundation, Education Strategy Group produced the following report to examine existing career readiness programs in Baltimore City Schools and provide strategies for increasing the alignment between these programs and the high-value economic opportunities growing in Baltimore City.

Methods

Baltimore City Schools (City Schools) contracted with Education Strategy Group (ESG) in 2018 to perform a comprehensive review of its career preparation efforts—especially its CTE programming—and provide strategic recommendations to more effectively prepare all Baltimore students for careers in in-demand, high-skill, high-wage industries. Between May and November 2018, ESG interviewed Baltimore education, workforce, and policy leaders; conducted surveys and focus groups of key stakeholders, including students, teachers, counselors, and employers; and analyzed a range of student performance data.

Surveys

ESG created and administered surveys to four City Schools stakeholder groups—counselors, teachers, students, and parents/guardians—to gauge each group's understanding of the value of Career Technical Education (CTE) and career preparation options available for students in City Schools, and the quality of City Schools' CTE programs. Though four stakeholder groups were surveyed, this report only incorporates responses from three due to unrepresentative sampling in the parent survey.

See **Appendix A** for comprehensive survey information.

Focus Groups

ESG conducted five focus groups: two with students, two with teachers and counselors, and one with employers. Baltimore City Schools determined group location and participant selection. Due to student scheduling and transportation challenges, each student focus group took place at a school (Forest Park and Mergenthaler Vocational Technical High Schools) with only students from that school participating. Participants were selected to mirror the larger student body: Groups included students from various programs of study (and, at Forest Park, students not currently pursuing any of City Schools' career programs of study), grade levels, and demographic groups.

The combined teacher/counselor focus groups were also school-based, though faculty members from across the district were invited to participate. Each group consisted of 12-15 participants. ESG was unable to conduct a parent and guardian focus group due to lack of parent/guardian registrations.

See **Appendix B** for focus group protocols.

Data Analysis

Finally, ESG conducted an analysis of City Schools' career readiness performance data to identify and compare differences between CTE students and the larger student body, across CTE career clusters (groups of programs of study within the same industry sector), across high schools, and between CTE student populations.

ESG entered into a data sharing agreement with City Schools to receive the following types of data:

- City Schools high school enrollment
- CTE enrollee, concentrator, and completer status

- Proficiency in PARCC Algebra II, PARCC English Language Arts 11, Biology High School Assessment, Government High School Assessment, and Advanced Placement exams
- Dual enrollment completion
- Industry-recognized credential attainment
- College enrollment 12 months post-graduation

These data were reported for the following groups:

- By high school
- By CTE cluster
- By grade level
- By student sub-group, including:
  - Gender
  - Race and ethnicity
  - English language learner (ELL) status
  - Free and reduced meals (FARMs) status
  - Student disability status

Unfortunately, due to data system limitations, data were unavailable for the following metrics:

- College enrollment without remediation
- Graduate employment status
- Teacher PRAXIS and industry-recognized credential data
- Work-based learning participation

See **Appendix C** for summary data.

Research Questions

To form strategies and recommendations for strengthening City Schools' CTE programs, ESG focused its analysis on answering questions centered on five key themes:

1. **Labor Market Alignment**: Do programs of study align to the in-demand, high-skill, high-wage career options in Baltimore? Do students participate in, and complete, these programs?
2. **Quality and Rigor of Programs of Study**: Do current CTE programs of study embed opportunities to earn relevant early credit in postsecondary degree programs and high-value industry-recognized credentials? Do students have the ability to participate in industry-aligned work-based learning?
3. **Equity in Access and Outcomes**: Are programs of study distributed across high schools to give all students access to priority programs? Are certain student groups over- or under-represented within the CTE student population?
4. **Student Achievement**: Do CTE concentrators and completers earn high-value industry-recognized credentials and early postsecondary credit? Do they complete work-based learning? Are they meeting college readiness benchmarks and enrolling in college at rates similar to their peers?
5. **Employer Partnerships and Barriers**: What barriers discourage employers from offering high-quality, industry-aligned work-based learning to City Schools' students?

The following section presents the results of ESG's analysis, combining survey data, focus group feedback, and programmatic data to answer these and other questions.

Findings

Labor Market Alignment

Participation in Priority-Aligned CTE

Baltimore City Schools has done well in creating a range of programs of study for students to pursue, with each priority industry—advanced manufacturing, business administration and management, construction trades, healthcare and biosciences, IT, and transportation—represented as a CTE career cluster. These **priority-aligned clusters, however, are not the driving force of CTE enrollment.**

> **Defining a Program of Study**
>
> A program of study is a progressive, coherent sequence of three or four courses. Programs of study that fall within the same industry sector are organized into career clusters.

While some priority clusters—in particular IT, Health and Biosciences, and Manufacturing—experience high enrollment, they are joined by heavily enrolled non-aligned clusters like Human Resource Services and Career Research and Development, which do not connect to in-demand, high-skill, high-wage occupations and instead lead primarily to lower-level, lower-wage jobs. The Career Research and Development cluster, specifically, is not aligned to any particular occupational path, but instead consists of two courses focused on student career exploration and professional skills development.

Table 1: CTE Students by Cluster

Cluster	2014-15	2015-16	2016-17	2017-18	4-Year % Change
Arts, Media, & Communication	1059	1090	1179	1082	2%
Business Management & Finance	**963**	**852**	**859**	**882**	**-8%**
Career Research & Development	1359	1647	1728	1657	22%
Construction & Development	**513**	**591**	**633**	**772**	**50%**
Consumer Services, Hospitality, & Tourism	1062	1143	1217	1243	17%
Environmental, Agriculture, & Natural Resources	416	560	660	767	84%
Health & Biosciences	**1411**	**1432**	**1546**	**1684**	**19%**
Human Resource Services	1887	1892	1931	1866	-1%
Information Technology	**1472**	**1707**	**1872**	**1693**	**15%**
Manufacturing, Engineering, & Technology	**1312**	**1361**	**1381**	**1353**	**3%**
Transportation Technologies	**223**	**320**	**378**	**476**	**113%**

Bolded clusters represent those aligned to Baltimore's six priority industries.
<u>Note</u>: Columns may not sum to 100% if students participate in programs across multiple clusters.

Additionally, though there is observable alignment between Baltimore's priority industries and City Schools' CTE clusters, not all programs of study within these clusters align to in-demand, high-skill, high-wage careers.

For instance, Transportation is a priority industry in Baltimore largely because of the city's port services. The majority of programs of study within the Transportation cluster, however, are Automotive Technology programs. This report, however, is limited to a cluster-to-industry analysis and is not an alignment analysis between programs of study and specific occupations.

Concentration and Completion in Priority-Aligned CTE

Students who concentrate in and complete CTE programs of study should generally have the opportunity to experience more advanced coursework, gain advanced skills, participate in real-world work experiences, and earn industry-recognized credentials and/or early postsecondary credit—but these opportunities are limited within City Schools CTE programs.[11] **Across the district in any given year, 10% of CTE students are program of study completers; and completion varies widely from cluster to cluster.** Within the IT cluster, for example, less than 1% of IT students reached completer status by the 2017-18 school year.

Concentration and Completion

Students who complete half of the courses in a sequence are considered "concentrators." Those who satisfy all course requirements are referred to as "completers."

Table 2: Percent of CTE Students Reaching Concentrator and Completer Status by Cluster

CTE Cluster	Completion				Concentration			
	2014-15	2015-16	2016-17	2017-18	2014-15	2015-16	2016-17	2017-18
Arts, Media, & Communication	15.4%	14.6%	13.4%	12.9%	19.5%	19.4%	18.5%	17.8%
Business Management & Finance	**4.9%**	**8.0%**	**6.2%**	**3.9%**	**14.5%**	**17.6%**	**15.3%**	**14.2%**
Career Research & Development	10.3%	7.0%	4.5%	4.2%	11.9%	9.1%	6.6%	6.3%
Construction & Development	**16.0%**	**13.7%**	**16.0%**	**15.0%**	**18.3%**	**16.9%**	**19.3%**	**19.4%**
Consumer Services, Hospitality, & Tourism	15.9%	14.9%	14.7%	16.2%	20.2%	18.7%	20.0%	20.4%
Environmental, Agriculture, & Natural Resources	--	--	3.0%	3.9%	3.6%	4.5%	11.4%	8.9%
Health & Biosciences	**11.8%**	**9.8%**	**8.3%**	**9.5%**	**23.7%**	**22.4%**	**19.1%**	**18.1%**
Human Resource Services	8.2%	10.0%	7.9%	7.7%	12.7%	15.1%	13.9%	12.2%
Information Technology	**2.1%**	**1.1%**	**1.3%**	**0.8%**	**9.6%**	**12.7%**	**13.4%**	**13.6%**
Manufacturing, Engineering, & Technology	**6.2%**	**8.5%**	**8.8%**	**7.9%**	**17.5%**	**19.1%**	**20.4%**	**20.9%**
Transportation Technologies	**15.3%**	**12.2%**	**20.1%**	**14.3%**	**31.8%**	**29.4%**	**37.6%**	**29.2%**

Bolded clusters represent those aligned to Baltimore's six priority industries.
Note: Concentration includes any student meeting or exceeding concentrator status (ie. includes completers).

Quality and Rigor of Programs of Study

Advanced Coursework and Early Postsecondary Opportunities

Students desire opportunities to complete advanced coursework and earn early college credit across programs of study; however, these opportunities are limited. As of School Year (SY) 2017-18, honors courses only existed in the Manufacturing, Engineering, and Technology cluster—largely in the Engineering program of study—and

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[11] Note: "Concentration" refers to taking and passing at least half of the required course sequence within a program of study. "Completion" refers to taking and passing all required courses with a program of study.

no program of study offered opportunities to earn college credit through embedded AP, dual enrollment, or dual credit courses.[12]

In SY 2017-18, among fourth-year CTE completers, 3% earned dual enrollment credit, and all credit was earned in courses external to their program of study.[13] AP success rates are similarly low, with just over 5% of the district four-year cohort and 1.6% of CTE completers passing any AP exam in SY 2017-18.

> **"We need more honors and AP classes combined with CTE classes. We need more help getting ready for college."**
> *City Schools Student*

Articulation agreements between secondary and postsecondary programs have long been a bedrock of CTE, enabling students to flow seamlessly into postsecondary programs aligned to their CTE coursework and shorten time to degree. **While City Schools has rightly put both statewide and local articulation agreements in place, they are rarely used**. Baltimore City Community College (BCCC), with which City Schools holds many articulation agreements, identified only one student who used his or her articulated credit in the last year. Low usage is likely exacerbated by the fact that the responsibility to award articulated credit largely falls to the students, who must self-advocate upon enrollment in college. BCCC does not currently work proactively with students to ensure that credit is awarded; and City Schools lacks a method for tracking articulated credit or communicating articulation opportunities broadly to students.

Despite the lack of available advanced coursework and early postsecondary credit opportunities, students, teachers, and counselors broadly agree that some level of postsecondary education—but not necessarily a four-year degree—is needed for student success.

Figure 1: "Students must continue education & training beyond high school to get jobs that pay good salaries & have advancement opportunities." (Survey Responses)
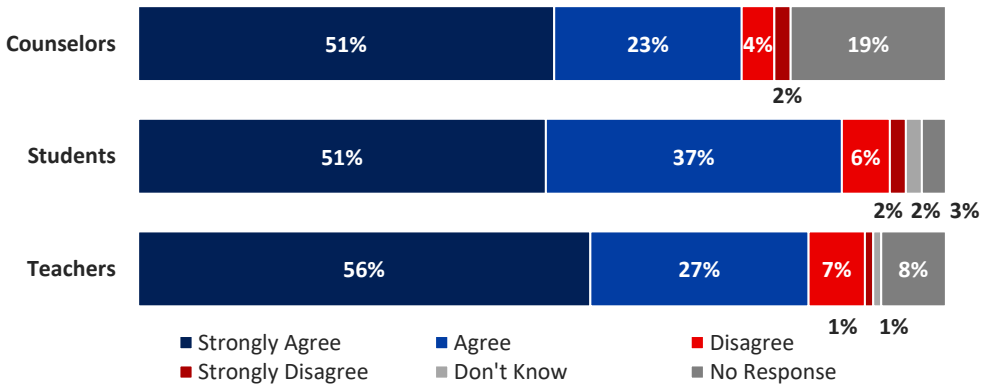
Industry-Recognized Credentials

Depending on the sector, industry-recognized credentials—those that signal to employers that a prospective employee has specific knowledge and skills—may be required or preferred for employment and advancement opportunities. With over 4,000 credentialing bodies, however, it is difficult to distinguish between credentials that directly connect earners to high-quality jobs from those that do not. Currently, City Schools offers over 70 credentials across its programs of study (see Appendix D). ESG's high-level analysis found that **approximately**

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[12] Note: As of SY 2018-19, City Schools has added AP Computer Science to the Computer Science program of study. Data in this report are restricted to SY 2014-15 through SY 2017-18.

[13] Note: Performance metrics—including early postsecondary credit and industry-recognized credential attainment—are calculated for a four-year student cohort based on first ninth-grade year. Figures for the report year only include students in their fourth year of high school (for 2017-18, this is students whose first-time ninth-grade year was in 2014-15).

10% of offered credentials, if earned, could directly connect students to jobs that pay family-sustaining wages (about $28 per hour in Baltimore City).[14,15] These credentials, such as Cisco certifications, frequently appear on job postings as required or preferred for high-skill, high-wage positions in in-demand fields. An additional one-third, though they do not connect students directly to family-sustaining wages, have value as important stepping stones toward advanced credentials. The Construction cluster's NCCER Level 1 certifications are an example of these. While they may increase students' ability to access apprenticeship programs (or even count for credit within those programs), many skilled trades require advanced certifications to access better paying jobs.

While there is potential for City Schools students to earn valuable credentials, the vast majority of CTE students do not: Though credential attainment among CTE completers was as high as 55% in SY 2016-17, the majority of credentials awarded in a given year are lower-level credentials, such as Adobe suite and Microsoft Office certifications, that do not directly connect students to employment opportunities within Baltimore's six priority industry areas.[16]

> **"We need to reevaluate what our needs are and align our programs to that. If you're certified in something you'll never get a job in, what's the point?"**
> *City Schools Teacher*

Though City Schools sets aside roughly $100,000 in Perkins funding for credential exams, staff have noted difficulty in scaling credential attainment. Significant barriers include a lack of district capacity to ensure that all programs of study and schools are taking advantage of this funding and student readiness to take and pass exams.

Work-Based Learning

Work-based learning opportunities—like internships and youth apprenticeships—are a significant component of high-quality CTE, enabling students to apply classroom-developed academic and technical skills to real-world problems and gain critical professional skills. Currently, the district is not able to collect any data on the number or quality of work-based learning opportunities taking place within the district and lacks a strategy to grow these opportunities. **All work-based learning activities to date have happened largely as a result of individual efforts of school staff (often the CTE teachers themselves), as opposed to a coordinated, district-wide strategy.** Other factors—specifically a lack of public transportation options and students' professional readiness—pose additional barriers to implementing quality work-based learning experiences across City Schools.

Despite these challenges, there are promising opportunities to build and scale work-based learning in Baltimore. The Mayor's Office of Employment Development (MOED) is positioned to partner in this work as an agency that is tightly connected with the business community and has experience in running the city's summer youth employment program (YouthWorks). Work-based learning intermediaries such as Urban Alliance and the Baltimore Alliance for Careers in Health are increasing employer readiness to offer paid internships. In addition to this work, representatives from City Schools serve as chair members of MOED's education subcommittee; and MOED and City Schools have laid further groundwork for collaboration through last year's inaugural Mayor's Job Fair, which received enthusiastic support from the business and industry leaders Education Strategy Group spoke with in its review.

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[14] Glasmeir, Amy K. 2004. "Living Wage Calculator for Baltimore City, Maryland." *Living Wage Calculator*. Massachusetts Institute of Technology: Cambridge, MA. Updated 2019. <http://livingwage.mit.edu/counties/24510>

[15] Note: ESG based its analysis on the Living Wage Calculator's estimation for one adult plus one child as a minimum threshold for family-sustaining wages, rather than a living wage estimation, which only estimates required for one independent adult.

[16] Note: Industry-recognized credential attainment rates were calculated for a 4-year cohort of students based on their first ninth-grade year. The credential attainment figure above represents only students who were both part of the report year's 4-year cohort *and* CTE completers. The 2016-17 school year is the latest year for which full credential attainment data were reported.

Equity in Access and Outcomes

Distribution of Programs of Study

While City Schools has done well in increasing the number of students enrolled in CTE (enrollment has increased 3% between school years 2014-15 and 2017-18, from 10,221 to 10,492), ESG found that gaps remain in student access and participation. ESG analyzed the distribution of programs of study by geography (city quadrant), school type (CTE center versus non-CTE center), and school performance. While 30 of the 46 high schools in City Schools have at least one program of study, providing student access to some programming, there is opportunity to improve students' access to more, higher-quality programming. **In general, geographic disparity is compounded by the fact that the highest-priority programs are most likely to be found in the schools that perform best academically, while the most unaligned programs are found in lower-performing schools.**

Not all programs in priority-aligned clusters are distributed equally across the four city quadrants—northwest (NW); northeast (NE); southwest (SW); and southeast (SE). Only one school—Mergenthaler Vocational Technical HS—in the NE quadrant offers any IT programming, and no school in the NE offers Biomedical Sciences. Construction programs are under-represented in the NW and SE, though equipment costs and space requirements are likely contributing factors to this trend. Though the SW offers the only Manufacturing Technologies program in the city, it lacks an Engineering program of study.

Program placement also varies based on school type. Specifically, the majority of programs that require significant start-up costs or lab space—including 12 of 16 Construction programs and 10 of 16 Health and Biosciences programs—are located within the six "CTE centers" (Carver Vocational Technical HS, Digital Harbor HS, Edmonson-Westside HS, Mergenthaler Vocational Technical HS, Patterson HS, and Vivien T Thomas Medical Arts Academy*).

More problematic than the differences between CTE centers and traditional high school models, though, is the disparity between high-performing and lower-performing schools. Across the district, the lowest-performing schools are home to a disproportionate share of programs that are unaligned to Baltimore's priority industries. Many programs—like Computer Science, Pre-Engineering, and Biomedical Sciences—in priority-aligned clusters are housed primarily in high-performing schools, many of which have highly competitive academic admissions requirements that pose a significant barrier to students trying to access those programs.

Figure 2: Distribution of priority programs of study by average school performance
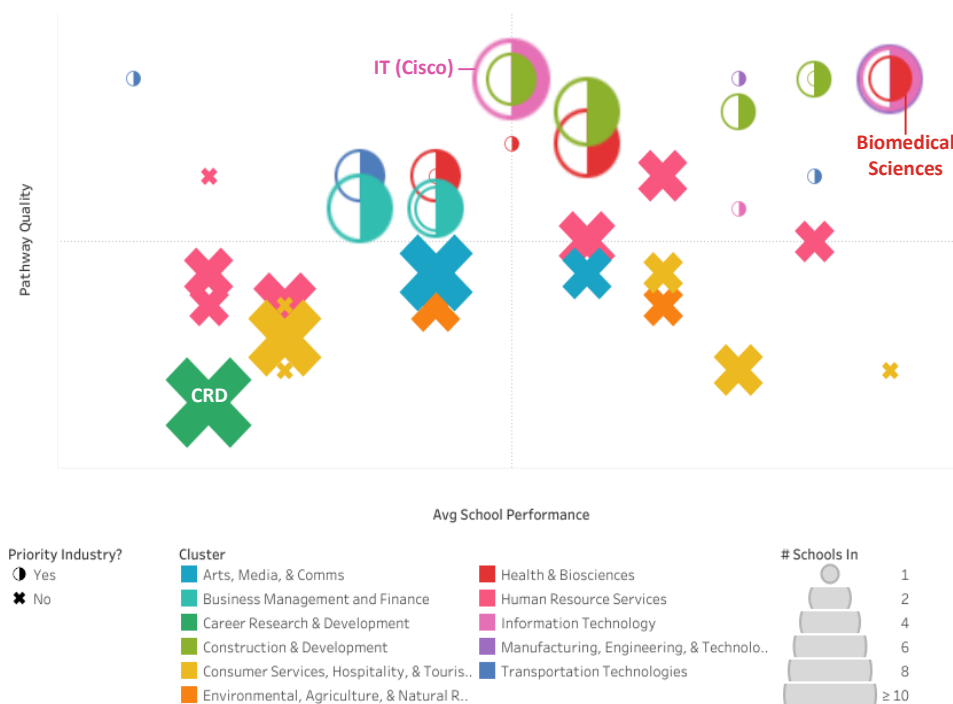
Note: "Avg. School Performance" refers to an index of metrics (including PARCC proficiency and college enrollment) averaged across the schools in which a program of study is located. "Program Quality" refers to the alignment of a program of study to high-skill, high-wage occupations within a priority industry. Each plot represents a program of study, color-coded by career cluster. Programs denoted by circles belong to clusters aligned to one of Baltimore's six priority industries, while those denoted by an X-shape reside in unaligned career clusters.

Barriers to access do not go unnoticed: One-third of counselors (32%), 26% of teachers, and 38% of students surveyed said that barriers existed in accessing most or all programs of study. Nearly 20% of counselors reported that only some programs of study are accessible to any student, and an additional 21% reported that few to none are.

Equity in Participation, Concentration, and Completion

Broadly, the CTE student population largely mirrors the district student body, with some caveats:

- **Differences by Gender**: At the district level, males are more likely to participate in programs of study than females, and gender representation varies by cluster. Female students are under-represented in priority-aligned clusters like Construction and IT and are over-represented in Health and Biosciences (priority-aligned) and Consumer Services (not priority-aligned). Though male students represent the majority of students enrolled in programs of study, female students are more likely than males to complete a full sequence of courses (11.3% and 9.4% in SY 2017-18, respectively).
- **Differences by Race and Ethnicity**: Black students, who represent the majority of all City Schools students, are over-represented among program of study completers. Students of other races, though they participate in CTE, are less likely to complete a full program of study. Latino students are somewhat over-represented in the IT cluster.

- **Differences by Special Population Status**: English language learners (ELLs) are somewhat over-represented in the IT cluster. Students with disabilities are over-represented—and primarily concentrated—in two non-aligned clusters: Career Research and Development (21%) and Human Resource Management (20%). These students, and those from other special populations (including ELLs and students receiving free and reduced meals) are additionally under-represented among completers.

See Appendix C for more details.

Student Advisement

Students and their families must have access to clear, comprehensive information about their educational options, as well as the ownership to make decisions about their future. Across the district, ESG found that **communication and advisement about critical decisions—which high school to attend, whether to participate in CTE, which program of study to choose—exists largely on an ad-hoc basis and varies from school to school.** While the district has tools like Naviance, which can guide college and career advisement beginning in middle school, they are infrequently used to direct conversations with students about these decisions; and no other comprehensive advisement tools or strategies exist at this point. Across the district, teachers and counselors reported feeling that students are not given enough guidance or direction around school choice or program of study participation. In focus groups conducted with teachers and counselors, participants remarked that students frequently "end up" at their schools because those schools have no admissions requirements; but upon enrollment, many of these students realize that they are uninterested in the programs offered at their school. Others noted that some students may not even be aware that they are in a CTE program, having been enrolled into a course without actively electing to participate.

Students and their families also need information about the *value* of career programs, just as they see the value in postsecondary education. Of those surveyed, 88% of students agreed or strongly believed that some level of postsecondary education was necessary to get a good job; however, nearly one-quarter of students (23%) also believe that career programs like CTE are only for students who do not plan to attend college. This perception that career programs of study represent a separate, non-college track is held more widely among students than teachers and counselors, indicating an opportunity to reframe or increase communication about the value of career programs to students and families.

Figure 3: "CTE is for students who don't plan to go to college." (Survey Responses)

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	No Response
Counselors	4%	4%	34%	36%	4%	17%
Students	8%	15%	35%	17%	21%	4%
Teachers	5%	5%	37%	36%	7%	10%
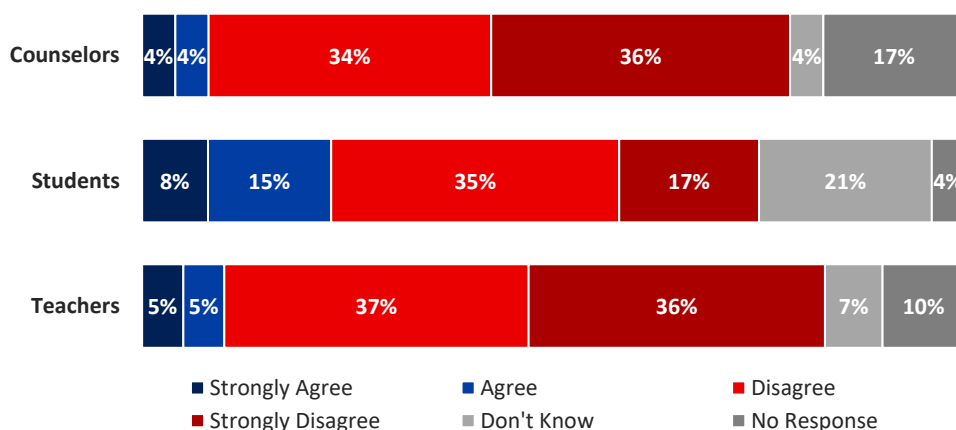
Student Achievement

Academic Proficiency

Across the district—but especially among students in career preparation programs—proficiency in core academic areas is driven by a few high-performing schools. At the district level, less than 20% of all fourth-year students were proficient in English Language Arts (ELA) 11 and only 5% were proficient in Algebra II in SY 2017-18.[17,18] This proficiency, however, is not spread evenly across the district, but is instead concentrated primarily in Baltimore Polytechnic, Baltimore City College, Baltimore School of the Arts, Baltimore Leadership School for Young Women, and Western High School. This trend is even more dramatic among students enrolled in CTE programs of study: In the same school year, 10.6% of fourth-year CTE students were proficient in ELA 11 and 2.3% were proficient in Algebra II, with proficiency rates driven by Baltimore Polytechnic and Western High School.

College Enrollment

At the district level, college enrollment rates of program of study completers roughly mirror the larger student body. Within the Class of 2017, 43.9% of all graduates and 42.4% of program of study completers enrolled in college 12 months after graduation. College enrollment rates do vary, however, by cluster. Class of 2017 CTE completers in four priority clusters—IT, Health and Biosciences, Manufacturing, and Business Management—enrolled in college at a higher rate than that total graduate population.

College enrollment rates also vary from high school to high school. Though many schools' programs of study data on completers are too small to fully assess variations at this level, the data that are available suggest that students at some schools may receive some benefit from completing a program of study. For instance, 50% of the Class of 2017 completers at Forest Park High School enrolled in college 12 months after graduation, compared to 37% of the total student body. A similar trend was observed for the Class of 2017 at Dunbar High School (74.2%, 55.1%), Reach Partnership High School (31.3%, 25%), Vivien T Thomas Medical Arts Academy (66.7%, 50%), and Western High School (86.4%, 69.1%). See Appendix C for more details.

Figure 4: College Enrollment, 12 Months Post-Graduation (Class of 2017 CTE Completers by Cluster)

Cluster	Enrollment
IT	80%
Health & Bio	59%
Manufacturing	56%
Business	49%
HR Services	45%
Consumer Services	45%
ALL PATHWAYS	42%
Arts	36%
Construction	20%
CRD	
Environmental	
Transportation	
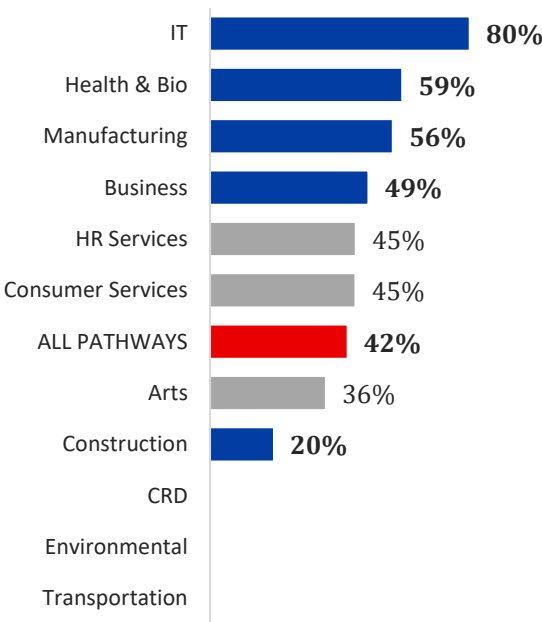
Note: Enrollment rates for the Career Research and Development, Environmental, and Transportation clusters for the Class of 2017 were too small for reporting. Priority-aligned clusters are denoted in blue.

Transition Courses

In 2013, Maryland passed the College and Career Readiness and College Completion Act (CCRCCA) which, among other policies, required districts to implement math and English Language Arts transition courses for students who fail to meet the subject's college and career readiness standard. While other districts have been able to incorporate transitions curriculum into other courses, Baltimore City Schools has had to offer these as standalone courses given the volume of students who need them. **To make room in student schedules for**

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[17] Note: Algebra II and ELA 11 are commonly used as college-ready benchmarks, though Maryland regulation does not specifically require students to demonstrate proficiency in these exams.

[18] Note: PARCC proficiency figures are calculated for a cohort of students based on their first ninth-grade year.

required transition courses, electives—including CTE—are often cut, limiting these students' ability to complete full programs of study.

Employer Engagement

While City Schools has an active Local Advisory Committee (LAC) made up of local employers, it is not leveraged as a strategy for engaging these and other employers to help shape City Schools' career readiness programming—though employers are eager to engage, particularly around CTE program advisement and work-based learning. The LAC, in its current form, has little responsibility or ownership over programmatic decision-making. According to some members, meeting times are infrequent and not often leveraged to gather employer feedback and insight. LAC membership also does not fully reflect the priority industries and leading companies in Baltimore City.

While some have previously worked with individual schools or teachers to organize work-based learning and career exploration activities for students, employers desire a single district-wide point of contact to facilitate better communication and engage with more students. Coordinated efforts between City Schools and the Mayor's Office of Employment Development (MOED), like last year's inaugural Mayor's Job Fair, are well-received by employers for these reasons and offer opportunities to improve and build relationships between City Schools and local employers.

Beyond structural barriers to engaging employers effectively in CTE, student readiness remains a challenge even after relationships and opportunities are built. Many students participating in work-based learning or seeking employment, according to employers, lack critical skills necessary to succeed at work, including professional skills like communication and foundational academic skills in reading, writing, and mathematics.

District Vision and Capacity

Within focus groups conducted by ESG, teachers and counselors observed that the district's strategic plan (*Building a Generation: City Schools' Blueprint for Success*) does not directly address career readiness or leverage CTE as a strategy within its stated priorities. While employers expressed a clear interest in working with the school system to provide work-based learning, they simultaneously voiced a need for a district-wide and district-driven process. Those employers who participate in the LAC expressed a willingness to help shape these programs and policies, but said that the district does not currently empower them to have a decision-making role.

A significant hurdle to fully incorporating career readiness initiatives into the district's vision is its inability to accurately capture important program metrics. District staff have noted challenges in setting, and uncertainties about, metric business rules—particularly around CTE concentration and completion. The district also currently lacks the ability to fully capture work-based learning information, validated data on all offered industry-recognized credentials, data on the number of students earning articulated credit in college, and data on students taking remedial postsecondary coursework.

Recommendations

City Schools has made commendable progress in building career preparation programs that span a range of industries and student interests. It has strong foundational pieces in place—such as clearly defined program of study course sequences, advisement and exploration tools like Naviance, articulation agreements with higher education institutions, and maturing relationships with the employer community—on which to build the next generation of demand driven programs.

The recommendations that follow parse out specific steps City Schools can take to reach a clear and ambitious goal: transforming their early career preparation work into rigorous 9-14 career pathways that culminate in credentials leading to in-demand, high-skill, high-wage jobs while also preparing students for the expectations of college. Indeed, this fits hand in glove with the bigger goal City Schools has set for itself of building a generation of young people with the skills, knowledge, and understanding to succeed in college, careers, and community—not just in Baltimore—but in any city in the world.

Creating transformational change on the magnitude of what is envisioned in these recommendations will clearly require substantial leadership and staff capacity from City Schools. Effective leadership must fully believe in and understand the need for integrated college and career readiness systems. Leading this work will not only involve developing and carrying out systems-change within the school district, but will also require visibility and respect within the business and philanthropic communities and a strong, collaborative relationship with higher education partners. Further, leadership must be empowered to develop a team of professionals responsible for implementing change with fidelity. That team will need to have deep knowledge of career preparation programming; clear guidance on *how* to support the college and career readiness work of schools; professional development on academic support strategies to embed within CTE; and the firm belief in the shared vision of preparing all students for both college and career. Finally, leadership must be supported by collaborative relationships within the district office to ensure that college and career readiness efforts are tightly aligned to the broader district vision. Transforming programs cannot rest on one team: It will require the buy-in and dedication of the entire district.

Increase Program Alignment to In-Demand, High-Skill, High-Wage Occupations

Economic conditions in Baltimore City and the surrounding region look bright, with steady job growth in a number of highly-skilled and well-paying fields. Tremendous opportunity awaits City Schools students who develop the knowledge and skills valued within Baltimore's priority sectors. Critical decisions about career readiness initiatives in the district—including which programs of study to scale and which to scale down or phase out—must be guided by and aligned to these economic signals to increase access to high-value career opportunities for all students.

City Schools should collaborate with MOED and higher education partners to conduct an analysis of local labor market information and identify Baltimore's in-demand, high-skill, high-wage occupations. While this study provided a foundational analysis of the alignment between Baltimore's priority industries and City Schools' career clusters, not all occupations within an industry are highly valued and well-paying, and not all programs of study prepare students for success in priority occupations and industries. Mapping the alignment

between specific programs of study and occupations will enable City Schools to better identify the most promising pathways for connecting students to opportunity.

Upon completion of this analysis, City Schools should apply the information gathered to **determine which programs should be scaled, which should be transformed to better align to priority occupations, and which should be phased out or—at minimum—offered less frequently and with greater rigor**. This will likely require substantial shifts in offerings, but will ultimately improve equity in students' preparedness for high-value postsecondary opportunities. During its review and transformation of programs of study, City Schools should leverage the expertise of industry leaders serving on City Schools' Local Advisory Committee (LAC), as well as the Baltimore Workforce Investment Board.

Strengthen the Quality of Aligned Programs of Study

Helping more students graduate from high school remains a worthy goal for City Schools, but students need more to be effectively prepared for the postsecondary world—whether they go directly to college after graduation or first enter the world of work. To be prepared for prosperous futures, students must gain as many early postsecondary credits as possible to put them a step closer toward a degree and/or have opportunities to earn an industry-recognized credential that leads to a job with a living wage.

City Schools should **develop and implement a plan to ensure each priority program of study—those tightly aligned with high-value career opportunities—is rigorous and includes opportunities for students to earn:**

- **Relevant postsecondary credit in a degree program through dual enrollment or dual credit <u>and/or</u>**
- **An aligned, high-value industry-recognized credential.**

This work should begin with a review of current course sequences and requirements of each priority program of study (i.e. those that were identified as aligned to priority occupations through labor market analysis) to determine the extent to which they include dual enrollment opportunities and/or opportunity to earn a high-value credential. Upon completion of this review, City Schools should collaborate with its higher education partners to go deeper within a gap analysis to:

- **Study the barriers to student participation in dual enrollment.** If the full cost (including books and fees) and transportation cannot be covered by City Schools, dual credit should be considered as an alternative model to provide students early postsecondary opportunities on their high school campus.
- **Systematize the way in which articulation agreements are enacted and used.** City Schools should proactively identify students eligible to earn articulated credit to both clearly communicate that opportunity to students and their families and share that list of students with articulation partners like BCCC and CCBC. In turn, BCCC and CCBC should automatically issue course credits in the appropriate degree program to eligible students and formally notify them of that transaction.
- **Use labor market information to determine which industry-recognized credentials are high-quality enough to be embedded within priority programs of study.** Credentials that connect earners directly to good jobs, as well as those that serve as a first step toward earning subsequent credentials that lead to good jobs, should be prioritized. Those that fail to meet either of these criteria should be removed from programs of study. Business and industry leaders from priority sectors should be partners in this effort with City Schools.

Finally, **City Schools should embed the promising speed-up/catch-up strategies already in place throughout the district into each program of study to support student proficiency in math and English and build college readiness skills.** Proficiency is needed for <u>all</u> students to be successful in both credit-bearing college coursework and careers that are in-demand, high-skill, and high-wage. Supports like math transition courses should not only exist as standalone classes: These same strategies should be integrated into coursework within

a program of study. Rigorous programs of study should support and reinforce students' academic proficiency by applying core academic skills to real-world problems.

As part of this process, City Schools staff from the College and Career Readiness Division should provide CTE teachers with professional development opportunities that focus on ways in which academic support strategies can be embedded within instruction. To the extent feasible, City Schools should devise and implement strategies to connect core academic teachers and CTE teachers for integrated instructional planning.

Expand Student Access to Priority Programs of Study

Each of the identified priority programs of study should be made available in at least one open-enrollment high school in both the east and west sides of the district. Though the distribution of some programs of study (e.g. construction trades) may be limited by significant start-up and equipment costs or space requirements, many could be made more widely and more equitably available throughout the district. City Schools' impressive work in creating a community conditions index has already begun the important work of mapping student access to other high-quality opportunities, such as the distribution of gifted and talented programs across the district and student participation within them. The index could also incorporate priority career programs of study as an easy entry-point to this analysis to ensure that access to the highest-quality career preparation programs is equitably available to students throughout the district.

It is important to note that <u>all</u> students should have access to in-demand, high-skill, high-wage programs of study—not just those who meet entrance criteria at selective high schools or demonstrate proficiency in core subjects. To leave high-value programs of study locked behind those doors puts meaningful opportunities out of reach for too many students. Programs of study that are relevant to the real world and provide hands-on application of material should be used as another strategy to <u>build</u> students' math and reading proficiency and prepare them for the demands of college and the workplace.

Ensuring open access to programs of study will require programs to be supplemented with additional support structures to help all students thrive in a rigorous environment, however. To both maintain high standards within priority programs of study <u>and</u> leave the door open to all students, City Schools should identify the student supports that are currently in place within programs of study, the gaps that exist, and existing resources that can be embedded into career programming to better support all students. As mentioned above, this could include embedding speed-up/catch-up content for core academic skills, and may include other supports for specific special populations—including support from ELL and special education coordinators.

Strengthen Advisement and Student Placement Processes Governing CTE Enrollment

Strong academic and career advisement should begin in middle school with focused career exploration and extend through high school with internships and related experiences to better prepare all students for their post-high school goals. A strong partnership with MOED and industry leaders will be essential to accomplishing this. To create more robust advisement, City Schools should:

- **Use existing tools like Naviance to their full capabilities to provide individualized advisement to all middle school students.** Before making their high school choices, middle school students should be aware of the in-demand, high-skill, high-wage career options available in the city, the courses and programs of study that allow them to explore and prepare for those careers, and the credentials (including degrees) they must earn to realize their career goals.
- **Build counselor capacity to create and provide structured guidance for middle school students that:**
  - Unpacks City Schools' high school choice system;
  - Clearly explains the range of program options available throughout the district and any associated school entrance requirements;

- o Identifies the schools that offer the programs of study of greatest interest to each middle school student; and
- o Helps students determine the list of schools to which they will apply.
- **Provide counselors with the professional development needed to support their ability to advise students on the multitude of rigorous postsecondary options available to them.** Counselors have indicated a clear interest in building their knowledge and understanding of high-value career opportunities so that they can confidently advise students on steps to take in high school for long-term professional success. Significant professional development will need to be offered to help counselors in this pursuit.
- **Develop and implement a structured, systematic process—led by City Schools College and Career Readiness Division staff—to enroll students in programs of study in high school.** Career interests expressed by students in middle school should serve as the starting point in discussions with students to advise them on program of study enrollment decisions related to their long-term career goals. Students should opt into (and out of) programs of study with help and direction from counselors and should not be placed into a program of study without acknowledgement and consent of that decision.

Build and Scale a High-Quality Work-Based Learning Program

Work-based learning opportunities—such as internships and youth apprenticeships—enable students to apply classroom content to real-world problems and develop the professional skills necessary to succeed in the workplace. City Schools should **expand and formalize a partnership with MOED or a work-based learning intermediary to build, and eventually scale, a robust work-based learning program** with the goal of making an industry-aligned internship available to—at minimum—all students concentrating in priority programs of study.

Students should be prepared for these immersive experiences prior to placement. **Professional skills curriculum should be adopted and embedded within the priority programs of study courses** that lead to workplace experiences so that students develop skills needed for professional work environments, from communicating professionally to working collaboratively to demonstrating financial literacy.

Additionally, the district should **design a continuum of experiences to meet the needs and readiness levels of all students.** This continuum could start in middle school with early job exploration experiences—such as field trips, career fairs, and guest speakers from industry—before progressing to on-the-job training opportunities in high school. While a site-based internship is the ultimate goal for all students, City Schools and MOED may also investigate other forms of rigorous, school-based experiences (e.g. simulated workplaces, industry-evaluated capstone projects) to overcome significant barriers like student transportation that inhibit students' ability to get to an internship site.

Build Robust Data Systems to Track Progress

What gets measured gets done: Robust data collection and reporting are crucial to keeping work on track, flagging gaps or challenges, and assessing impact of work. To that end, City Schools should **build a robust student information system** that captures all student data—including career programming data—in a single repository to enable accurate and efficient access to information that should be tracked as the district measures progress toward its goals. This data system must include the ability to follow students through a program of study—identifying those that concentrate in and complete programs, complete industry-aligned work-based learning, earn high-value industry-recognized credentials and early postsecondary credit, and demonstrate readiness for credit-bearing postsecondary coursework.

Next Steps for City Schools

Though the recommendations in this section are intended to be comprehensive in scope, Education Strategy Group recognizes that City Schools cannot address and implement all of the recommendations simultaneously. Strengthening career readiness programming to connect all students to high-value postsecondary

opportunities will require sustained incremental change. Rather than taking on all of the above recommendations at once, City Schools should identify which it can address in the immediate future, and those that will require a longer runway for coalition building, resource gathering, and strategic planning.

Conclusion

For too long, there has been a one-size-fits-all approach to economic prosperity that has only benefitted a subset of students. The reality is that, while some level of postsecondary education and training is necessary to access good jobs that pay family-sustaining wages, there are many high-quality, rigorous pathways students can take to connect to these opportunities; and all students deserve access to those pathways. Strong career readiness programming that prepares students for both family-supporting, competitive careers and college can widen the net of prosperity and strengthen communities.

By undertaking a comprehensive, rigorous review of its current CTE programs, Baltimore City Schools is beginning the challenging work to make this philosophy a reality for its students. Though this analysis revealed significant challenges in the district—from the alignment and content of programs to student access and achievement—it also uncovered early promising practices and opportunities.

As Baltimore City Schools crafts its next steps and begins to implement change, it must remember that the most transformative pathways are built through partnership. Improving student readiness and outcomes is not a task that the district can undertake on its own. Local postsecondary institutions—including Baltimore City Community College and the Community College of Baltimore County—and the Mayor's Office for Employment Development should be engaged from the start to build programs that extend from Baltimore City Schools into postsecondary education and the workforce and are informed by industry leaders. Through cross-sector partnership, programs can be made more accessible and robust, ensuring that all Baltimore youth are prepared for economic and career success.

Appendices

Appendix A: Survey Responses
Administrator/Teacher Survey

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	No Response
As a CTE or STEM teacher in City Schools, I would value the opportunity to participate in a paid summer externship at a workplace in a high-skill, high-demand field to strengthen my ability to build real-world applications into instruction and make the classroom experience more relevant and engaging for students.	24%	12%	1%	2%	2%	60%
City Schools must prepare all students for a wide range of postsecondary opportunities that lead to prosperous futures, including apprenticeships and 2-year colleges as well as 4-year colleges.	71%	20%	1%	0%	0%	8%
City Schools must prioritize increasing the number of students who earn industry certifications that employers value much like they prioritize increasing the number of students taking and passing AP exams.	53%	33%	3%	0%	3%	7%
CTE is for students who don't plan to go to college.	5%	5%	37%	36%	7%	10%

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	No Response
Real-world work experiences (like internships) in City Schools are valuable for all students including those going to a 4-year college as well as those going to a 2-year college, apprenticeship, or the workplace in making	70%	19%	1%	0%	2%	8%

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	No Response
informed choices about their long-term goals and plans.						
Students must continue their education and training past high school in order to get a job that pays a good salary and offers opportunities for career advancement.	56%	27%	7%	1%	1%	8%
Students who earn an associate's degree or industry certification (that signals to employers skills needed for a job) in an in-demand field will have a wide range of professional opportunities available to them that offer good salaries.	47%	38%	4%	0%	3%	8%
The CTE program of study or STEM program I teach is connected to local industry partners that provide career exploration (field trips, guest speakers) and/or real-world work opportunities for my students.	16%	14%	6%	3%	1%	60%
Within the next several years, the US economy will need nearly the same number of workers with associate's degrees/professional certificates as bachelor's degrees.	29%	31%	13%	3%	13%	11%

	All Programs	Most Programs	Some/ Few Programs	No Programs	Don't Know	No Response
City Schools' CTE programs of study are accessible to all students interested in participating.	23%	25%	17%	6%	15%	14%
City Schools' CTE programs of study are aligned with those offered in college to allow students a seamless opportunity to continue their education and training after high school.	19%	26%	20%	4%	18%	13%
City Schools' CTE programs of study are designed to help all students (regardless of their postsecondary goals) develop the academic knowledge and technical skills needed to succeed in college and career.	21%	31%	18%	3%	15%	13%

City Schools' CTE programs of study connect students to high-skill, high-demand career fields that offer good salaries upon program completion.	18%	31%	18%	4%	16%	13%
City Schools' CTE programs of study have barriers to participation, including admissions requirements, program location/availability, etc.	10%	16%	24%	14%	24%	12%
City Schools' CTE programs of study have strong partnerships with an array	9%	23%	30%	7%	18%	12%

of local businesses, giving students access to internships and other real-world work experiences.						
City Schools' CTE programs of study offer challenging, rigorous curriculum aligned to industry standards.	20%	30%	16%	3%	15%	15%
City Schools' CTE programs of study offer, and expect students to participate in, opportunities to earn relevant industry certifications.	26%	31%	14%	1%	16%	12%

	Always	Often	Sometimes/Rarely	Never	Don't Know	No Response
As a high school CTE or STEM teacher in City Schools, I feel confident in my ability to deliver integrated academic and technical instruction in a way that is rigorous and relevant to all students' academic and career interests.	25%	11%	4%	0%	0%	60%
City Schools encourages students to pursue dual enrollment as part of their CTE program of study with college partners such as BCCC, Coppin State, Morgan State, and the University of Baltimore.	10%	23%	24%	4%	24%	15%
City Schools offers professional development opportunities and incentives that enable CTE and STEM teachers to earn industry certifications and strengthen their instructional practices in the high-skill, high-demand fields for which they prepare all students.	9%	7%	12%	8%	0%	60%
City Schools teachers and administrators use their professional network to connect students to career exploration and real-world work experiences like internships/employment, job shadowing, and mentoring.	16%	32%	22%	2%	12%	16%
Collaboration occurs between CTE teachers and core academic teachers to align lesson plans and curriculum so that math and literacy are embedded into CTE courses.	10%	22%	31%	7%	15%	15%
CTE courses within City Schools prepare students for college-level coursework.	15%	29%	21%	3%	17%	15%
CTE courses within City Schools prepare students for immediate entry into good jobs in the workforce (through apprenticeships, training programs, or direct employment).	17%	32%	20%	1%	14%	16%
I am asked by my school to teach courses outside of my CTE or STEM field.	4%	2%	7%	26%	0%	60%
Naviance is used effectively to help City Schools' students understand the range of meaningful opportunities available after high school and set postsecondary goals.	9%	20%	29%	3%	24%	15%
School counselors in City Schools help middle and high school students understand the wide range of valuable career opportunities available to	12%	25%	29%	3%	15%	15%

	Always	Often	Sometimes/Rarely	Never	Don't Know	No Response
them after high school, including those that require an apprenticeship or associate's degree as well as those that require a bachelor's degree.						
Students primarily take CTE or STEM courses because they are actively interested in pursuing a career in that industry and/or gaining professional skills.	7%	18%	10%	2%	0%	60%
Teachers, counselors, and administrators receive information on the career preparation opportunities available within City Schools.	12%	23%	31%	6%	13%	16%
The quality of instruction students receive in CTE classes is as strong as the quality they receive in core academic classes.	24%	25%	13%	3%	20%	15%

Counselor Survey

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	No Response
City Schools must prepare all students for a wide range of postsecondary opportunities that lead to prosperous futures, including apprenticeships, 2-year colleges, and 4-year colleges.	66%	8%	2%	2%	2%	19%
City Schools must prioritize increasing the number of students who earn industry certifications that employers value much like they prioritize increasing the number of students who take and pass AP exams.	62%	17%	2%	0%	2%	17%
CTE is for students who don't plan to go to college.	4%	4%	34%	36%	4%	17%
Real-world work experiences (like internships) in City Schools are valuable for all students—those going to a 4-year college as well as those going to a 2-year college, apprenticeship, or workplace—in making informed choices about their long-term goals and plans.	68%	11%	2%	0%	2%	17%
Students must continue their education and training past high school in order to get a job that pays a good salary and offers opportunities to advance in a career.	51%	23%	4%	0%	2%	19%
Students who earn an associate's degree or industry certification (that signals to employers skills needed for a job) in an in-demand field will have a wide range of professional opportunities available to them that offer good salaries.	45%	34%	0%	0%	4%	17%
Within the next several years, the U.S. economy will need nearly the same number of workers with associate's degrees/professional certifications as bachelor's degrees.	21%	40%	8%	0%	11%	19%

	All Programs	Most Programs	Some/Few Programs	No Programs	Don't Know	No Response
City Schools facilitates strong partnerships with a wide array of local businesses giving students access to internships and other real-world work experiences.	0%	11%	30%	15%	23%	21%
City Schools' CTE programs of study are accessible to all students interested in participating.	6%	17%	19%	21%	13%	23%
City Schools' CTE programs of study are designed to prepare all students (regardless of their postsecondary goals) to develop the academic	4%	23%	34%	4%	13%	21%

	All Programs	Most Programs	Some/Few Programs	No Programs	Don't Know	No Response
knowledge and technical skills needed to succeed in college and career.						
City Schools' CTE programs of study can connect students to high-skill, high-demand career fields that offer good salaries upon program completion.	8%	19%	30%	4%	17%	21%
City Schools' CTE programs of study have barriers to participation, including admissions requirements, program location/availability, etc.	13%	19%	19%	8%	17%	23%
City Schools' CTE programs of study offer challenging, rigorous curriculum aligned to industry standards.	2%	23%	23%	4%	21%	26%
City Schools' CTE programs of study offer, and expect students to participate in, opportunities to earn high-value industry certifications.	8%	26%	26%	4%	15%	21%

	Always	Often	Sometimes/Rarely	Never	Don't Know	No Response
As a school counselor, I receive information on career opportunities to help middle and high school students understand the wide range of career opportunities that are available and valuable after high school.	6%	13%	34%	17%	2%	28%
City Schools encourages students to pursue dual enrollment as part of their CTE program of study with college partners such as BCCC, Coppin State, Morgan State, and the University of Baltimore.	6%	30%	17%	4%	15%	28%
Counselors receive clear and comprehensive information on the career preparation opportunities available within City Schools.	6%	13%	38%	11%	4%	28%
CTE courses within City Schools prepare students for college-level coursework.	2%	11%	23%	4%	30%	30%
CTE courses within City Schools prepare students for immediate entry into good jobs in the workforce (through apprenticeships, training programs, or direct employment).	4%	26%	28%	4%	11%	28%

I am as confident advising students with a non-college postsecondary plan (apprenticeship, military, workforce training program) as those planning to attend 2-year or 4-year colleges.	13%	32%	19%	6%	2%	28%
I am prepared to advise students on opportunities available in high-skill, high-demand industries (like healthcare, advanced manufacturing, and IT) that provide good salaries and stable employment without requiring 4-year degrees.	13%	30%	17%	11%	2%	28%

	Always	Often	Sometimes/Rarely	Never	Don't Know	No Response
I feel confident advising students on individualized learning plans that include specific career objectives, a related program of study, degree and/or industry certificate objectives, and specific strategies to reach employers.	17%	21%	28%	4%	2%	28%
Naviance is used effectively to help City Schools' students understand the range of meaningful opportunities available after high school and set postsecondary goals.	2%	15%	38%	4%	13%	28%
Scheduling and/or graduation requirements interfere with students' ability to complete a CTE program of study.	4%	6%	30%	11%	21%	28%
Students primarily take CTE courses because they are interested in pursuing a career in that industry.	2%	38%	21%	0%	11%	28%
The quality of instruction students receive in CTE classes is at least as strong as the quality they receive in core academic classes.	2%	32%	17%	0%	21%	28%

Student Survey

	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know	No Response
CTE was an important part of my decision to go to this high school.	22%	26%	21%	8%	14%	9%
I have opportunities to participate in high-quality real-world work experiences, like internships, through my school.	30%	40%	11%	4%	11%	5%
I have taken a CTE class even though I did not ask to participate in that program.	13%	23%	28%	13%	16%	8%
I have taken at least one CTE class because I was interested in that career field and/or in gaining professional skills.	24%	30%	18%	8%	14%	6%
I have wanted to take a CTE class but was never scheduled for it, even after telling a teacher/counselor that I was interested in it.	10%	16%	34%	20%	13%	7%
I know what steps I need to take to participate in an internship while in high school.	20%	37%	17%	6%	12%	7%
I need education and training beyond high school to get a job that pays a good salary and lets me advance in my career.	51%	37%	6%	2%	2%	3%
I think that CTE is for students who don't plan to go to college.	8%	15%	35%	17%	21%	4%
I will have more career options that pay a good salary if I earn an associate's degree or industry certification in a field that has a lot of job opportunities.	37%	46%	7%	1%	6%	4%
I wish I knew more about the CTE programs that are already offered at my high school and at other City Schools.	22%	43%	15%	2%	11%	7%
I wish there were more CTE programs at my school in fields that offer good jobs, such as healthcare, advanced manufacturing, and information technology (IT).	27%	42%	9%	2%	13%	6%
Schools should prepare students for all types of valuable opportunities after high school, including apprenticeships, 2-year colleges, and 4-year colleges.	51%	37%	3%	1%	4%	4%
Students who complete a Career and Technology Education (CTE) program in high school can still attend a 4-year college or university after high school graduation.	37%	40%	6%	1%	13%	4%

	All Programs	Most Programs	Some Programs	Few/No Programs	Don't Know	No Response
City Schools' CTE programs expect students to take advantage of opportunities to earn industry certifications that help them get good jobs.	27%	32%	16%	3%	14%	8%
City Schools' CTE programs have admissions requirements that prevent some students from being able to participate.	15%	23%	20%	9%	26%	8%
Completing a City Schools' CTE program helps students find jobs after graduation that pay a good salary and support professional growth.	23%	33%	20%	3%	13%	8%
Participating in a City Schools' CTE program would help any student gain the knowledge and skills needed to be ready for college and career.	25%	35%	18%	2%	12%	8%

	Always	Often	Sometimes/Rarely	Never	Don't Know	No Response
I receive information on the career preparation opportunities that are available throughout City Schools.	22%	28%	21%	9%	11%	10%
I think the quality of teaching students receive in CTE classes is as strong as the quality they receive in other classes.	23%	28%	18%	4%	17%	10%
I use Naviance to explore the range of meaningful opportunities available to me after high school and to create my plan to go to a 4-year college, a 2-year college, an apprenticeship, or into a good job after high school.	17%	21%	21%	15%	17%	9%
In middle school, I received information about the CTE programs that each high school offers and their admissions requirements to help me decide which high school I wanted to attend.	17%	17%	17%	24%	15%	10%
My school counselor helps me understand the range of meaningful opportunities available to me after high school—including 4-year college, 2-year college, apprenticeships, and employment.	28%	25%	18%	8%	12%	9%
My school encourages me to take college classes at Baltimore City Community College, Coppin State, Morgan State, and/or the University of Baltimore as part of a CTE program.	21%	25%	20%	11%	13%	9%
Taking a CTE course is one good way to prepare for a good job after high school.	33%	27%	13%	2%	14%	11%
Taking CTE courses is one good way to prepare for college-level courses.	30%	27%	16%	3%	14%	10%

Appendix B: Focus Group Protocols
Business and Industry Focus Group

Introduction: Thank you for participating in today's focus group. Your feedback is very important, and we appreciate you taking the time to talk with us today.

Baltimore City Schools has hired Education Strategy Group (ESG) to conduct a review of the district's career preparation efforts, including career and technology education—which is commonly known as CTE—and identify opportunities to better serve students and ultimately fulfill the employment needs of the business community.

Through this review, City Schools is taking the initiative to push for CTE and career preparation efforts that are driven by employer demand, though they recognize that they do not yet have the relationship with the employer community to do this. Our purpose today is to identify the extent to which relationships between the district and business community exist, the roles employer partners have in education, and the barriers preventing these relationships from forming.

Before we begin, I'd like to review the consent form that was distributed and ask you to sign it if you agree to participate in this group. If you do not consent, you may leave the group at this time. [READ THE CONSENT FORM AND COLLECT SIGNED COPIES.]

Please know that the information you share in this focus group will not be attributed to you or your organization, so you should feel comfortable providing honest, candid, and straightforward responses to the questions posed. Are there any questions before we begin?

Focus Group Questions

(Quick round of introductions, including first name and business/industry represented)

First, I'd like to ask about your involvement with City Schools and its career preparation programs.

1. The goal of career education, and employer collaboration with City Schools generally, is—at least in part—to prepare students to fulfill local and regional workforce needs as future employees.

   a. Do you see high school students as part of your talent pipeline strategy? If yes, what do you do to engage and prepare high school students? If not, why not?

   b. To what extent do you use labor market data to identify current and future employment needs, as well as the skills and knowledge that are necessary to meet those needs?

      i. How do you deliver this information to potential employees—including students?

     ii. What communications mechanism would work best for the district and business community to understand workforce needs and translate needs into curriculum?

    iii. What process for engaging the district in this work generally would work best? (Ex: participating in committees, an annual summit, etc.)?

  c. How do you, as employers and leaders in the business community, **lead** the development of a process with City Schools to determine which career pathways and programs are needed?

  d. For those of you who are a part of the Baltimore City LAC or are familiar with it, do you view the business community as the main driver of this process? Why or why not?

2. To what extent do you think City Schools CTE programs are aligned with current industry trends that connect students to jobs that pay a family-sustaining wage and offer opportunities for advancement?

  a. If a CTE program no longer leads to high-skill, high-wage, in-demand jobs, but there are still vacancies in the field that need to be filled, should the program be retired? Why or why not?

Next, I'd like to ask a few questions about the role employers can play in developing teachers and preparing students to fulfill local and regional workforce needs.

3. High-quality work-based learning experiences like internships are important for students to connect classroom learning to real-world tasks.

  a. By a show of hands, how many of you currently offer internships to City Schools' students? How many of you offer other work-based learning experiences, like job shadowing?

  b. Do you focus on specific skills development in those experiences? If so, what are some examples?

  c. What works well in those experiences? Where is their room for improvement?

  d. If you don't currently offer work-based learning, what barriers or challenges are keeping your from participating?

e.   What methods of work-based learning would you be most interested in? If one-on-one internships aren't viable, do you think you or your organization would be open to small student group strategies? [GIVE NAF MODEL EXAMPLE]

4.   A major goal of CTE is to enable students to attain credentials (including certificates, licenses, or industry-recognized credentials) that are valued in the labor market. To what extent do you as employers use these types of credentials—specifically sub-baccalaureate credentials—to recruit and hire qualified employees?

5.   Teachers play a vital role in preparing students for success after high school. Do you think that employers in Baltimore City might be willing to provide paid summer externships to CTE and STEM teachers, allowing them to spend time in a workplace to strengthen their knowledge, skills, and understanding of how their classroom content is applied in a workplace?

Finally, I'll ask a few general questions about your opinions of City Schools' career preparation efforts and your role in those efforts.

6.   Do you feel that City Schools' graduates are prepared to enter the workforce? If not, what do you think they are missing?

7.   In your opinion, what should City Schools do differently within its CTE programs to prepare students for success after high school?

8.   What work would you like to do with City Schools on career preparation that you have not already undertaken?

9.   How can you (or your organization) be better utilized by City Schools to prepare students for success after high school?

Thank you for your participation.

School Counselors and Teachers Focus Group

Introduction: Thank you for participating in today's focus group. Your feedback is very important, and we appreciate you taking the time to talk with us today.

Baltimore City Schools has hired Education Strategy Group (ESG) to conduct a review of the district's career preparation efforts, including Career and Technical Education, or CTE, programs. Our job is to collect information on these different efforts in the school system to identify ways those efforts can better serve students and their families.

The information you share in this focus group will not be attributed to you, so you should feel comfortable providing candid, honest, and straightforward responses to the questions posed.

Please remember that you received and signed a consent form to participate in this group, which means your participation is voluntary. We'll try to keep our time here together to one hour. Are there any questions before we begin?

Focus Group Questions

First, I'd like to get a sense of who is in the room and better understand your professional position in City Schools.

1. Please raise your hand if you are a:
    a. CTE teacher
    b. STEM (Science, Math, Engineering, Technology) teacher
    c. Teacher of a non-CTE, non-STEM subject
    d. School counselor
    e. School administrator

Thank you. Next, I'd like to ask for your thoughts about postsecondary opportunities that are valuable and meaningful for students.

2. Raise your hand if you think industry certifications (*define*) put students on a path to careers with good salaries.
3. Raise your hand if you think apprenticeships (*define*) offer students a path to careers with good salaries.

Next, I'd like to learn more about what you know and think about the efforts within City Schools to prepare students for college and career, including CTE.

4. How does City Schools share information with you about the range of postsecondary opportunities that will set students up for success, such as 4-year colleges, community colleges, apprenticeships, and industry certifications?
5. When you think of CTE (Career and Technical Education):
    a. Do you think that it prepares students for 4-year and 2-year colleges, apprenticeships, and industry certifications? Why or why not?
    b. Do you think it is valued as an integral part of your school's work to prepare students for postsecondary success? Should it be?
    c. In what ways is it strong, and in what ways could it be improved?
6. When you think of the students in CTE:
    a. To what extent do you think students are in CTE because they are interested in pursuing a career in that field and/or gaining professional skills?
    b. To what extent do you think admissions requirements, program location, and scheduling are barriers to student participation?
7. What opportunities exist within City Schools for students to pursue work-based learning opportunities (like internships)?
8. Should *all* students have real-world work experiences with local businesses as part of their high school experience to prepare for their futures?
    a. Are students encouraged to pursue these opportunities?
9. Do career preparation programs in City Schools - like PLTW, NAF, PTECH, CTE - help students earn college credit and/or valuable industry-recognized credentials (like Cisco for students in IT pathways) while they are in high school?
    a. Is earning an industry certification an expectation for students in City Schools' career preparation programs?
    b. Is earning an industry certification emphasized as important in City Schools?
    c. Is earning college credit toward a degree while in high school emphasized as important?

Next, I'll ask a few questions to better understand where you might want and need more support in preparing students for postsecondary success.

10. Do you feel that you understand the range of postsecondary opportunities available to students - including 4-year colleges, community colleges, industry certifications, and apprenticeships - that lead to professional jobs that pay good salaries and offer opportunities for professional growth?
    a. Do you feel that you understand the industries and job opportunities accessible with different credentials (industry certifications, apprenticeships, associate's degrees, bachelor's degrees)?
    b. To what extent does City Schools provide clear information about the growth in jobs that pay a family-sustaining wage that require some level of postsecondary education, but not a full bachelor's degree?
11. As a CTE or STEM teacher:
    a. Do you feel it would strengthen your instructional practice if you had more information or support to better understand the application of the technical content you teach? (e.g. How is trigonometry used in a work setting?)

      b. How connected do you feel to your pathway's local industry? Are there connections to the workforce that provide guest speakers, field trips, internships, or other work-based learning experiences?

12. As a counselor:

      a. To what extent do you feel prepared to advise students on the wide range of specific career opportunities available and related course-taking?

      b. Do you have clarity on which fields are high-skill, high-demand and lead to prosperous opportunities and which are much more limited for students?

13. How might City Schools support staff and students to help them understand the types of careers available, the courses they must take, and the credentials they must earn to find a good job in their field of choice?

14. Are there opportunities for City Schools to better expose students to career development? What are examples?

Finally, do you have any additional comments or suggestions that you would like to make before we close?

Thank you for your participation.

Student Focus Group

Introduction: Thank you for participating in today's focus group. Your feedback is very important, and we appreciate you taking the time to talk with us today.

Baltimore City Schools has hired our company, Education Strategy Group (ESG), to talk with you about the ways the school system prepares you for a career. This includes Career and Technical Education, or CTE, but we will be talking about other programs today too. Our job is to collect information to figure out how the school system can better serve you and your families.

We will not identify who participated in this focus group; no one will know what you say during this session, so you should feel comfortable giving honest, straightforward answers to our questions.

Your parent or guardian has already agreed to let you take part in this focus group, but your participation is voluntary. Choosing not to participate in this focus group, or choosing not to answer questions, will not affect your school performance or your ability to participate in school programs. Our conversation today will last about one hour. Are there any questions before we begin?

Focus Group Questions

First, I'd like to ask you about your opportunities after high school.

1. Tell us your first name, your grade, and your favorite class.
2. Raise your hand if you have a pretty clear idea of what you want to do after graduation.
    a. Raise your hand if you're really not sure what you want to do yet.
    b. Where do you get advice to help you make those decisions about what you'll do after high school?
3. Raise your hand if:
    a. you think earning a degree from a 4-year college will help you find a career with a good salary.
    b. you think earning a degree from a community college will help you find a career with a good salary.
    c. you think completing a job training program, like an apprenticeship (*define*), will help you find a career with a good salary.
    d. you think earning a high-value industry certification (*define*) will help you find a career with a good salary.
4. Do you receive helpful information from your school about the different routes you can take to find a good career?
    a. Does your school help you choose what courses to take based on what you want to do after high school?
    b. In what ways has your school helped you learn about different careers you might be interested in?
5. How do you get information about career preparation opportunities that are available in your school or within City Schools, like CTE?
6. What kind of support would help you better understand the types of careers that are available?

7. What kind of support would help you better understand the classes you need to take and the degrees or certifications you need to earn to get a job in those fields?

Thank you. Next, I'd like to ask you a few questions about career preparation in City Schools, especially Career and Technical Education (CTE).

8. Raise your hand if you know what "Career and Technical Education" or "CTE" is in City Schools?
9. Raise your hand if you've taken more than one CTE course.
    a. If yes, why did you decide to enroll in CTE?
    b. If yes, how has it been different from other classes you've taken?
    c. Do you have to work as hard in your CTE classes as you do in your academic courses, like math and English?
    d. If you have not enrolled in CTE, why?
10. Were CTE programs important when you decided what high school you wanted to attend?
11. Has your school encouraged you to earn an industry credential while in high school?
12. Should all students have real-world work experiences with local businesses, like internships, as part of their high school experience to prepare them for the future? Why or why not?
    a. Have you been encouraged to participate in an internship or a similar experience with a local business during the school year or over the summer? Explain.

Next, I'll ask a few questions about how to improve your school's ability to prepare you for a career.

13. What are some challenges get in the way of you participating in career preparation programs like PLTW, NAF, PTECH, and CTE?
14. How do you think CTE programs could be improved so that more students would be interested in them?
    a. What would make CTE programs more interesting to you?
15. Would you be more interested in a CTE program if it offered free opportunities to take classes at a local college?
16. Would you be more interested in a CTE program if different programs were offered at your high school?
    a. What programs would you like to see offered?

Finally, do you have any additional comments or suggestions that you would like to make before we close? Thank you for your participation.

Appendix C: Data Request Tables

Distribution of Enrollment across Cluster

CTE Cluster	2014-15	2015-16	2016-17	2017-18
Arts, Media, & Communication	10.4%	10.4%	10.8%	10.3%
Business Management & Finance	**9.4%**	**8.1%**	**7.9%**	**8.4%**
Career Research & Development	13.3%	15.6%	15.9%	15.8%
Construction & Development	**5.0%**	**5.6%**	**5.8%**	**7.4%**
Consumer Services, Hospitality, & Tourism	10.4%	10.9%	11.2%	11.9%
Environmental, Agriculture, & Natural Resources	4.1%	5.3%	6.1%	7.3%
Health & Biosciences	**13.8%**	**13.6%**	**14.2%**	**16.1%**
Human Resource Services	18.5%	18.0%	17.7%	17.8%
Information Technology	**14.4%**	**16.2%**	**17.2%**	**16.1%**
Manufacturing, Engineering, & Technology	**12.8%**	**12.9%**	**12.7%**	**12.9%**
Transportation Technologies	**2.2%**	**3.0%**	**3.5%**	**4.5%**

Bolded clusters represent those aligned to Baltimore's six priority industries.

Concentration and Completion by Cluster

CTE Cluster	Completion				Concentration			
	2014-15	2015-16	2016-17	2017-18	2014-15	2015-16	2016-17	2017-18
Arts, Media, & Communication	15.4%	14.6%	13.4%	12.9%	19.5%	19.4%	18.5%	17.8%
Business Management & Finance	**4.9%**	**8.0%**	**6.2%**	**3.9%**	**14.5%**	**17.6%**	**15.3%**	**14.2%**
Career Research & Development	10.3%	7.0%	4.5%	4.2%	11.9%	9.1%	6.6%	6.3%
Construction & Development	**16.0%**	**13.7%**	**16.0%**	**15.0%**	**18.3%**	**16.9%**	**19.3%**	**19.4%**
Consumer Services, Hospitality, & Tourism	15.9%	14.9%	14.7%	16.2%	20.2%	18.7%	20.0%	20.4%
Environmental, Agriculture, & Natural Resources	--	--	3.0%	3.9%	3.6%	4.5%	11.4%	8.9%
Health & Biosciences	**11.8%**	**9.8%**	**8.3%**	**9.5%**	**23.7%**	**22.4%**	**19.1%**	**18.1%**
Human Resource Services	8.2%	10.0%	7.9%	7.7%	12.7%	15.1%	13.9%	12.2%

Information Technology	2.1%	1.1%	1.3%	0.8%	9.6%	12.7%	13.4%	13.6%
Manufacturing, Engineering, & Technology	6.2%	8.5%	8.8%	7.9%	17.5%	19.1%	20.4%	20.9%
Transportation Technologies	15.3%	12.2%	20.1%	14.3%	31.8%	29.4%	37.6%	29.2%

Bolded clusters represent those aligned to Baltimore's six priority industries.

<u>*Note*</u>*: Concentration includes any student meeting or exceeding concentrator status (ie. includes completers)*

Cluster Composition by Student Demographic

Gender

Cluster	Gender	2014-15	2015-16	2016-17	2017-18
Arts, Media, & Communication	Female	39.3%	37.1%	37.9%	41.1%
	Male	60.7%	62.9%	62.1%	58.9%
Business Management & Finance	**Female**	**43.0%**	**43.4%**	**41.2%**	**42.7%**
	Male	**57.0%**	**56.6%**	**58.8%**	**57.3%**
Career Research & Development	Female	45.3%	44.9%	46.8%	46.1%
	Male	54.8%	55.1%	53.2%	54.0%
Construction & Development	**Female**	**7.6%**	**12.4%**	**14.5%**	**19.6%**
	Male	**92.4%**	**87.7%**	**85.5%**	**80.4%**
Consumer Services, Hospitality, & Tourism	Female	70.0%	68.9%	70.7%	71.2%
	Male	30.0%	31.2%	29.3%	28.8%
Environmental, Agriculture, & Natural Resources	Female	47.6%	47.9%	46.1%	44.3%
	Male	52.4%	52.1%	53.9%	55.7%
Health & Biosciences	**Female**	**77.1%**	**76.8%**	**75.5%**	**75.8%**
	Male	**22.9%**	**23.3%**	**24.5%**	**24.2%**
Human Resource Services	Female	59.1%	56.7%	55.8%	55.7%
	Male	40.9%	43.3%	44.2%	44.3%
Information Technology	**Female**	**34.8%**	**37.0%**	**38.3%**	**38.0%**
	Male	**65.2%**	**63.0%**	**61.8%**	**62.0%**
Manufacturing, Engineering, & Technology	**Female**	**23.3%**	**24.7%**	**27.7%**	**32.4%**
	Male	**76.7%**	**75.3%**	**72.3%**	**67.6%**
Transportation Technologies	Female	**9.4%**	**13.1%**	**14.6%**	**14.3%**
	Male	**90.6%**	**86.9%**	**85.5%**	**85.7%**

Race/Ethnicity

Cluster	Race	2014-15	2015-16	2016-17	2017-18
Arts, Media, & Communication	Asian	--	--	--	--
	Black	88.4%	87.7%	87.0%	86.0%
	Latino	6.0%	6.9%	8.2%	9.2%
	Other	--	--	--	--
	White	4.7%	4.9%	4.2%	4.3%
Business Management & Finance	**Asian**	**--**	**--**	**--**	**--**
	Black	**94.7%**	**94.1%**	**92.7%**	**91.5%**
	Latino	**2.7%**	**3.8%**	**5.1%**	**5.9%**
	Other	**--**	**--**	**--**	**--**
	White	**1.5%**	**1.2%**	**1.6%**	**1.9%**
Career Research & Development	Asian	--	--	--	--
	Black	95.1%	93.3%	91.4%	89.7%
	Latino	3.0%	3.5%	5.2%	7.6%
	Other	--	--	--	--
	White	1.4%	2.4%	2.7%	2.2%
Construction & Development	**Asian**	**--**	**--**	**--**	**--**
	Black	**97.3%**	**96.8%**	**96.2%**	**95.7%**
	Latino	**--**	**--**	**--**	**2.2%**
	Other	**--**	**--**	**--**	**--**
	White	**2.0%**	**2.2%**	**1.9%**	**1.6%**
Consumer Services, Hospitality, & Tourism	Asian	--	--	--	--
	Black	96.0%	95.6%	95.0%	92.0%
	Latino	1.7%	2.0%	3.5%	6.2%
	Other	--	--	--	--
	White	2.2%	1.9%	1.1%	1.1%
Environmental, Agriculture, & Natural Resources	Asian	--	--	--	--
	Black	63.0%	69.3%	68.8%	74.6%
	Latino	12.5%	11.4%	12.1%	9.7%
	Other	--	--	--	--
	White	23.3%	18.4%	17.6%	14.6%
Health & Biosciences	**Asian**	**--**	**--**	**0.7%**	**0.8%**
	Black	**93.4%**	**93.8%**	**91.9%**	**92.2%**

Cluster	Race	2014-15	2015-16	2016-17	2017-18
	Latino	2.4%	2.3%	3.5%	4.0%
	Other	--	--	--	--
	White	3.4%	2.8%	3.5%	2.6%
Human Resource Services	Asian	0.7%	--	0.5%	--
	Black	93.4%	93.6%	92.3%	90.5%
	Latino	2.8%	3.2%	4.6%	6.7%
	Other	--	--	--	--
	White	2.9%	2.4%	2.3%	2.1%
Information Technology	Asian	1.0%	0.9%	0.9%	0.8%
	Black	84.3%	84.4%	84.6%	83.6%
	Latino	6.5%	8.1%	9.2%	10.9%
	Other	0.9%	--	0.7%	0.8%
	White	7.3%	6.1%	4.7%	4.0%
Manufacturing, Engineering, & Technology	Asian	1.5%	1.5%	1.5%	1.9%
	Black	90.2%	88.8%	87.1%	83.8%
	Latino	3.5%	4.6%	6.4%	8.3%
	Other	--	--	--	--
	White	4.2%	4.3%	4.3%	5.4%
Transportation Technologies	Asian	--	--	--	--
	Black	94.2%	93.8%	91.5%	89.7%
	Latino	--	3.1%	5.6%	7.8%
	Other	--	--	--	--
	White	--	--	--	--

-- Data masked due to sample size (n<10)

Concentration and Completion by Student Demographic

Gender

Cluster	School Year	Female		Male	
		Concentrator	Completer	Concentrator	Completer
Arts, Media, & Communication	2014-15	22.4%	17.8%	17.6%	13.8%
	2015-16	20.1%	16.1%	19.0%	13.7%
	2016-17	17.7%	13.4%	19.0%	13.4%
	2017-18	16.6%	13.9%	18.7%	12.1%
Business Management & Finance	2014-15	15.2%	5.8%	14.0%	4.2%
	2015-16	15.4%	7.6%	19.3%	8.3%
	2016-17	13.3%	5.7%	16.6%	6.5%
	2017-18	12.5%	3.5%	15.5%	4.2%
Career Research & Development	2014-15	12.5%	10.6%	11.3%	10.1%
	2015-16	9.6%	8.3%	8.6%	6.1%
	2016-17	7.7%	5.6%	5.7%	3.6%
	2017-18	6.7%	4.3%	5.9%	4.1%
Construction & Development	2014-15	--	--	18.4%	15.8%
	2015-16	15.1%	15.1%	17.2%	13.5%
	2016-17	29.4%	26.1%	17.6%	14.2%
	2017-18	15.9%	11.9%	20.3%	15.8%
Consumer Services, Hospitality, & Tourism	2014-15	21.4%	17.5%	17.2%	12.2%
	2015-16	18.6%	14.2%	19.1%	16.3%
	2016-17	21.3%	15.7%	16.8%	12.3%
	2017-18	21.6%	17.1%	17.6%	14.0%
Environmental, Agriculture, & Natural Resources	2014-15	--	--	--	--
	2015-16	5.2%	--	3.8%	--
	2016-17	12.8%	3.6%	10.1%	--
	2017-18	8.5%	5.0%	9.1%	3.0%
Health & Biosciences	2014-15	25.4%	13.0%	18.0%	7.7%
	2015-16	24.5%	10.5%	15.6%	7.5%
	2016-17	21.3%	9.7%	12.1%	4.2%
	2017-18	19.8%	10.3%	12.8%	7.1%

Cluster	School Year	Female		Male	
		Concentrator	Completer	Concentrator	Completer
Human Resource Services	2014-15	15.1%	10.1%	9.2%	5.3%
	2015-16	18.2%	13.7%	11.0%	5.2%
	2016-17	15.1%	10.3%	12.4%	4.9%
	2017-18	13.7%	9.4%	10.3%	5.6%
Information Technology	2014-15	10.2%	2.5%	9.3%	1.9%
	2015-16	11.7%	1.7%	13.3%	--
	2016-17	9.6%	--	15.7%	1.4%
	2017-18	12.0%	--	14.6%	--
Manufacturing, Engineering, & Technology	2014-15	20.3%	6.2%	16.6%	6.2%
	2015-16	21.1%	10.4%	18.4%	7.9%
	2016-17	19.6%	8.6%	20.6%	8.9%
	2017-18	20.3%	6.6%	21.2%	8.5%
Transportation Technologies	2014-15	--	--	35.2%	16.8%
	2015-16	--	--	33.5%	14.0%
	2016-17	--	--	42.1%	23.2%
	2017-18	16.2%	--	31.4%	15.2%

-- Suppressed due to small n-size

Race/Ethnicity

Cluster	School Year	Black		Latino		White	
		Concentrator	Completer	Concentrator	Completer	Concentrator	Completer
Arts, Media, & Communication	2014-15	18.2%	14.2%	33.3%	27.0%	24.0%	22.0%
	2015-16	18.0%	13.6%	26.7%	20.0%	34.0%	26.4%
	2016-17	17.5%	12.9%	23.7%	16.5%	28.6%	20.4%
	2017-18	17.2%	12.1%	20.2%	16.2%	26.1%	--
Business Management & Finance	2014-15	15.2%	5.2%	--	--	--	--
	2015-16	18.1%	8.4%	--	--	--	--
	2016-17	15.7%	6.4%	--	--	--	--
	2017-18	14.5%	4.0%	--	--	--	--

Cluster	School Year	Black		Latino		White	
		Concentrator	Completer	Concentrator	Completer	Concentrator	Completer
Career Research & Development	2014-15	11.9%	10.3%	--	--	--	--
	2015-16	9.5%	7.4%	--	--	--	--
	2016-17	6.9%	4.7%	--	--	--	--
	2017-18	6.9%	4.6%	--	--	--	--
Construction & Development	**2014-15**	**18.6%**	**16.2%**	**--**	**--**	**--**	**--**
	2015-16	**17.0%**	**14.0%**	**--**	**--**	**--**	**--**
	2016-17	**19.9%**	**16.4%**	**--**	**--**	**--**	**--**
	2017-18	**19.6%**	**15.4%**	**--**	**--**	**--**	**--**
Consumer Services, Hospitality, & Tourism	2014-15	19.8%	15.7%	--	--	--	--
	2015-16	18.5%	14.7%	--	--	--	--
	2016-17	20.0%	14.7%	--	--	--	--
	2017-18	21.2%	16.8%	--	--	--	--
Environmental, Agriculture, & Natural Resources	2014-15	5.3%	--	--	--	--	--
	2015-16	5.7%	--	--	--	--	--
	2016-17	15.6%	4.4%	--	--	--	--
	2017-18	11.0%	5.2%	--	--	--	--
Health & Biosciences	**2014-15**	**24.1%**	**11.5%**	**--**	**--**	**--**	**--**
	2015-16	**23.0%**	**9.9%**	**--**	**--**	**--**	**--**
	2016-17	**20.0%**	**8.5%**	**--**	**--**	**--**	**--**
	2017-18	**18.6%**	**9.8%**	**--**	**--**	**--**	**--**
Human Resource Services	2014-15	12.5%	8.1%	--	--	--	--
	2015-16	15.1%	10.2%	--	--	--	--
	2016-17	14.2%	8.0%	--	--	--	--
	2017-18	12.5%	8.2%	8.8%	--	--	--
Information Technology	**2014-15**	**9.2%**	**2.0%**	**--**	**--**	**13.0%**	**--**
	2015-16	**12.8%**	**0.9%**	**10.1%**	**--**	**12.5%**	**--**
	2016-17	**13.6%**	**1.4%**	**9.8%**	**--**	**17.2%**	**--**
	2017-18	**13.6%**	**0.9%**	**13.6%**	**--**	**--**	**--**
Manufacturing, Engineering, & Technology	**2014-15**	**16.4%**	**6.4%**	**--**	**--**	**30.9%**	**--**
	2015-16	**18.2%**	**8.1%**	**23.8%**	**--**	**23.7%**	**--**
	2016-17	**19.5%**	**9.1%**	**30.7%**	**--**	**21.7%**	**--**
	2017-18	**20.3%**	**8.0%**	**24.1%**	**--**	**21.9%**	**--**

Cluster	School Year	Black		Latino		White	
		Concentrator	Completer	Concentrator	Completer	Concentrator	Completer
Transportation Technologies	**2014-15**	**31.0%**	**14.3%**	**--**	**--**	**--**	**--**
	2015-16	**29.0%**	**12.0%**	**--**	**--**	**--**	**--**
	2016-17	**39.6%**	**21.4%**	**--**	**--**	**--**	**--**
	2017-18	**30.0%**	**14.8%**	**--**	**--**	**--**	**--**

Note: Asian and Other race categories were too small to be analyzed at the cluster level.

-- Suppressed due to small n-size

Special Populations

Cluster	School Year	FARMs		Limited English Proficiency		Students with Disabilities	
		Concentrator	Completer	Concentrator	Completer	Concentrator	Completer
Arts, Media, & Communication	2014-15	18.3%	14.5%	--	--	12.8%	8.1%
	2015-16	16.4%	11.8%	22.5%	--	16.3%	11.8%
	2016-17	16.2%	10.6%	19.7%	13.2%	15.7%	11.1%
	2017-18	--	--	21.0%	17.3%	10.6%	6.9%
Business Management & Finance	**2014-15**	**15.0%**	**4.9%**	**--**	**--**	**8.8%**	**--**
	2015-16	**18.0%**	**7.9%**	**--**	**--**	**8.1%**	**--**
	2016-17	**15.7%**	**6.1%**	**--**	**--**	**8.9%**	**--**
	2017-18	**--**	**--**	**--**	**--**	**11.5%**	**--**
Career Research & Development	2014-15	11.6%	9.9%	--	--	14.3%	11.7%
	2015-16	9.2%	7.2%	--	--	9.2%	7.2%
	2016-17	6.8%	4.8%	--	--	7.6%	5.7%
	2017-18	--	--	--	--	6.8%	4.8%
Construction & Development	**2014-15**	**18.1%**	**15.7%**	**--**	**--**	**15.0%**	**13.3%**
	2015-16	**13.8%**	**10.2%**	**--**	**--**	**11.8%**	**--**
	2016-17	**17.1%**	**13.0%**	**--**	**--**	**17.6%**	**12.7%**
	2017-18	**--**	**--**	**--**	**--**	**19.4%**	**13.8%**
Consumer Services, Hospitality, & Tourism	2014-15	19.2%	15.1%	--	--	18.2%	14.9%
	2015-16	18.3%	14.2%	--	--	16.4%	14.4%
	2016-17	18.6%	13.0%	--	--	11.0%	9.7%
	2017-18	--	--	--	--	14.8%	13.9%

Cluster	School Year	FARMs		Limited English Proficiency		Students with Disabilities	
		Concentrator	Completer	Concentrator	Completer	Concentrator	Completer
Environmental, Agriculture, & Natural Resources	2014-15	4.0%	--	--	--	--	--
	2015-16	4.6%	--	--	--	--	--
	2016-17	11.5%	3.7%	--	--	12.0%	--
	2017-18	--	--	--	--	7.5%	--
Health & Biosciences	**2014-15**	**22.7%**	**10.4%**	**--**	**--**	**16.2%**	**10.6%**
	2015-16	**21.5%**	**8.9%**	**--**	**--**	**13.9%**	**--**
	2016-17	**17.1%**	**6.4%**	**--**	**--**	**17.9%**	**--**
	2017-18	**--**	**--**	**--**	**--**	**13.4%**	**9.0%**
Human Resource Services	2014-15	12.6%	7.9%	--	--	7.3%	3.3%
	2015-16	14.5%	9.0%	--	--	10.2%	5.4%
	2016-17	12.6%	6.3%	--	--	12.1%	4.6%
	2017-18	--	--	--	--	10.0%	4.2%
Information Technology	**2014-15**	**9.4%**	**2.0%**	**--**	**--**	**5.6%**	**--**
	2015-16	**12.0%**	**1.0%**	**--**	**--**	**6.0%**	**--**
	2016-17	**11.2%**	**--**	**--**	**--**	**8.4%**	**--**
	2017-18	**--**	**--**	**9.5%**	**--**	**10.1%**	**--**
Manufacturing, Engineering, & Technology	**2014-15**	**16.7%**	**6.0%**	**--**	**--**	**6.6%**	**--**
	2015-16	**17.4%**	**7.9%**	**--**	**--**	**11.2%**	**--**
	2016-17	**17.2%**	**7.1%**	**--**	**--**	**17.0%**	**7.0%**
	2017-18	**--**	**--**	**22.5%**	**--**	**9.2%**	**--**
Transportation Technologies	**2014-15**	**29.9%**	**14.7%**	**--**	**--**	**35.6%**	**17.0%**
	2015-16	**28.5%**	**11.2%**	**--**	**--**	**31.9%**	**--**
	2016-17	**34.0%**	**14.6%**	**--**	**--**	**37.5%**	**20.8%**
	2017-18	**--**	**--**	**--**	**--**	**16.2%**	**9.9%**

-- Suppressed due to small n-size

College Enrollment by School and CTE Status

College Enrollment 12-Months Post-Graduation	2014-15	2015-16	2016-17
DISTRICT TOTAL			
CTE Completer	47.0%	47.2%	42.4%
CTE Concentrator	44.9%	44.7%	39.7%
Total Graduates	48.0%	47.0%	43.9%
Academy for College and Career Exploration			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	42.0%	29.0%	24.7%
Achievement Academy at Harbor City HS			
CTE Completer	17.6%	19.4%	3.3%
CTE Concentrator	17.3%	19.5%	3.0%
Total Graduates	13.8%	20.3%	6.8%
Augusta Fells Savage Institute of Visual Arts			
CTE Completer	36.4%	35.7%	21.7%
CTE Concentrator	31.3%	35.7%	18.5%
Total Graduates	18.6%	24.4%	15.1%
Baltimore City College			
CTE Completer	--	--	--
CTE Concentrator	50.0%	--	--
Total Graduates	70.6%	76.7%	76.9%
Baltimore Community High			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	15.6%	3.9%	--
Baltimore Design School			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	--	--	66.7%

Baltimore Leadership School for Young Women	2014-15	2015-16	2016-17
Baltimore Leadership School for Young Women			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	--	80.3%	87.8%
Baltimore Polytechnic Institute			
CTE Completer	100.0%	90.0%	82.5%
CTE Concentrator	100.0%	90.6%	82.8%
Total Graduates	81.3%	81.0%	79.5%
Baltimore School for the Arts			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	82.2%	78.3%	68.1%
Bard High School Early College Baltimore			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	--	--	63.6%
Benjamin Franklin HS			
CTE Completer	--	--	--
CTE Concentrator	--	44.4%	50.0%
Total Graduates	37.0%	33.8%	29.5%
Bluford Drew Jemison STEM Academy West			
CTE Completer	50.0%	100.0%	50.0%
CTE Concentrator	60.0%	54.5%	63.6%
Total Graduates	50.0%	53.8%	54.5%
Carver Vocational Technical HS			
CTE Completer	48.3%	50.0%	47.1%
CTE Concentrator	44.4%	46.7%	43.0%
Total Graduates	39.7%	46.8%	41.9%

City Neighbors HS			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	57.1%	42.4%	40.2%
Claremont School			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	--	--	--
ConneXions: A Community Based Arts School			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	42.9%	35.9%	44.1%
Coppin Academy			
CTE Completer	--	--	--
CTE Concentrator	100.0%	--	100.0%
Total Graduates	55.4%	50.0%	52.5%
Digital Harbor HS			
CTE Completer	50.9%	42.9%	47.1%
CTE Concentrator	47.2%	44.1%	40.8%
Total Graduates	43.5%	39.7%	31.8%
Eager Street Academy			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	--	--	--
Edmonson-Westside HS			
CTE Completer	34.4%	38.6%	39.8%
CTE Concentrator	34.0%	33.1%	37.1%
Total Graduates	31.1%	28.6%	35.1%
Excel Academy at Francis M. Wood HS			
CTE Completer	--	14.3%	5.3%
CTE Concentrator	--	12.5%	4.5%
Total Graduates	11.8%	9.8%	4.1%

Forest Park HS			
CTE Completer	64.3%	37.5%	50.0%
CTE Concentrator	52.9%	37.0%	48.8%
Total Graduates	28.8%	36.5%	37.3%
Frederick Douglass HS			
CTE Completer	60.0%	42.9%	40.0%
CTE Concentrator	40.0%	33.3%	35.3%
Total Graduates	31.8%	22.7%	20.8%
Friendship Academy of Engineering and Technology			
CTE Completer	40.0%	80.0%	60.0%
CTE Concentrator	23.1%	72.7%	53.8%
Total Graduates	38.8%	42.2%	25.9%
George WF McMechen HS			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	--	--	--
Green Street Academy			
CTE Completer	--	--	41.4%
CTE Concentrator	--	--	45.2%
Total Graduates	--	--	42.9%
Heritage High			
CTE Completer	75.0%	--	--
CTE Concentrator	57.1%	--	--
Total Graduates	34.1%	--	--
Independence School Local I			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	33.3%	40.0%	26.3%
Joseph C Briscoe Academy			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	--	--	--

KASA (Knowledge and Success Academy)			
CTE Completer	--	66.7%	--
CTE Concentrator	--	33.3%	44.4%
Total Graduates	34.4%	27.8%	22.2%

Patterson HS			
CTE Completer	46.9%	25.7%	22.2%
CTE Concentrator	50.0%	31.7%	29.2%
Total Graduates	48.3%	28.8%	27.8%

Maritime Industries Academy			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	35.0%	10.0%	--

Paul Laurence Dunbar HS			
CTE Completer	76.5%	79.4%	74.2%
CTE Concentrator	75.0%	76.9%	69.7%
Total Graduates	63.8%	67.2%	55.1%

Maryland Academy of Technology and Health Sciences			
CTE Completer	66.7%	50.0%	--
CTE Concentrator	62.5%	50.0%	--
Total Graduates	45.5%	39.4%	--

Reach! Partnership School			
CTE Completer	40.7%	44.1%	31.3%
CTE Concentrator	37.5%	40.5%	27.9%
Total Graduates	31.8%	35.9%	25.0%

Mergenthaler Vocational Technical HS			
CTE Completer	45.8%	48.0%	37.0%
CTE Concentrator	43.9%	45.9%	35.2%
Total Graduates	42.4%	43.3%	34.1%

Reginald F Lewis HS			
CTE Completer	40.0%	41.7%	33.3%
CTE Concentrator	33.3%	35.5%	34.8%
Total Graduates	33.3%	46.6%	28.9%

NACA Freedom and Democracy Academy II			
CTE Completer	--	--	--
CTE Concentrator	--	100.0%	--
Total Graduates	--	43.8%	25.0%

Renaissance Academy			
CTE Completer	100.0%	--	6.3%
CTE Concentrator	100.0%	100.0%	5.9%
Total Graduates	29.6%	23.5%	9.1%

National Academy Foundation			
CTE Completer	51.5%	42.9%	33.3%
CTE Concentrator	50.7%	47.8%	29.1%
Total Graduates	51.1%	46.2%	29.6%

Vivien T Thomas Medical Arts Academy			
CTE Completer	58.3%	58.8%	66.7%
CTE Concentrator	53.8%	53.8%	56.8%
Total Graduates	48.1%	42.1%	50.0%

New Era Academy			
CTE Completer	--	--	--
CTE Concentrator	--	37.5%	26.3%
Total Graduates	37.5%	25.0%	21.7%

W.E.B. DuBois High			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	26.1%	--	--

Northwestern High			
CTE Completer	75.0%	37.5%	25.0%
CTE Concentrator	61.5%	30.0%	15.4%
Total Graduates	32.2%	24.4%	25.0%

Western HS			
CTE Completer	78.8%	83.7%	86.4%
CTE Concentrator	78.0%	79.3%	78.6%
Total Graduates	72.3%	72.6%	69.1%

William S Baer School			
CTE Completer	--	--	--
CTE Concentrator	--	--	--
Total Graduates	--	--	--

-- Data masked due to sample size (n<10)

Industry-Recognized Credential Attainment by Cluster

IRC Attainment	2014-15	2015-16	2016-17	2017-18
All Pathways				
Completer	48.5%	52.7%	52.7%	*
Concentrator	41.5%	42.4%	44.1%	*
Enrollee	22.2%	20.8%	24.2%	*
Arts, Media, & Communication				
Completer	58.3%	44.4%	77.3%	*
Concentrator	50.4%	39.6%	64.5%	*
Enrollee	23.3%	24.8%	38.2%	*
Business Management & Finance				
Completer	47.7%	55.8%	68.1%	*
Concentrator	40.3%	40.0%	56.5%	*
Enrollee	26.6%	24.0%	40.7%	*
Career Research & Development				
Completer	--	23.4%	--	*
Concentrator	--	20.8%	42.4%	*
Enrollee	3.9%	5.6%	8.8%	*
Construction & Development				
Completer	90.8%	83.3%	69.1%	*
Concentrator	89.4%	75.3%	67.9%	*
Enrollee	57.0%	51.0%	43.1%	*
Consumer Services, Hospitality, & Tourism				
Completer	40.4%	44.6%	43.2%	*
Concentrator	37.8%	39.5%	36.5%	*
Enrollee	27.1%	31.4%	27.0%	*
Environmental, Agriculture, & Natural Resources				
Completer	--	--	--	*
Concentrator	--	--	--	*
Enrollee	--	--	--	*
Health & Biosciences				
Completer	36.0%	51.5%	54.6%	*
Concentrator	33.8%	40.7%	47.7%	*
Enrollee	17.9%	24.1%	27.4%	*

IRC Attainment	2014-15	2015-16	2016-17	2017-18
Human Resource Services				
Completer	82.5%	69.4%	53.6%	*
Concentrator	70.5%	60.9%	50.0%	*
Enrollee	30.9%	23.5%	21.9%	*
Information Technology				
Completer	--	--	--	*
Concentrator	13.8%	26.0%	14.7%	*
Enrollee	8.2%	7.9%	7.0%	*
Manufacturing, Engineering, & Technology				
Completer	26.1%	45.0%	43.6%	*
Concentrator	19.5%	36.2%	35.1%	*
Enrollee	11.7%	18.1%	19.8%	*

Transportation Technologies				
Completer	--	--	53.7%	*
Concentrator	--	--	42.3%	*
Enrollee	--	--	34.0%	*

-- Data masked due to sample size (n<10)

***** *Data collection for the 2017-18 4-year cohort was incomplete at the time of the data request.*

<u>Note</u>: CTE statuses are cumulative. Completers are included in the "Concentrator" calculation; and both completers and concentrators are included under "Enrollee," along with students who have taken at least one CTE course but not reached concentrator status.

Appendix D: Industry-Recognized Credentials Offered by Baltimore City Schools Career Cluster[19]

Career Cluster	Industry-Recognized Credential	Program(s) of Study
Arts, Media, & Communication	Adobe Dreamweaver Certification	Interactive Media Production
	Adobe Flash Illustrator Certification	Interactive Media Production
	Adobe InDesign Certification	Interactive Media Production
	Adobe Photoshop Certification	Interactive Media Production
	Adobe Premiere Pro Certification	Interactive Media Production
Business, Management, & Finance	Microsoft Office Specialist Certification	Business Administrative Services
	NAF-Track Certification	Academy of Finance
Construction & Development	Autodesk AutoCAD Certification	Construction Design & Management
	Autodesk Revit Certification	Construction Design & Management
	NCCER Core Curriculum + Level 1 Carpentry Certification	Construction Trades Professions: Carpentry
	NCCER Core Curriculum + Level 1 Electrical Certification	Construction Trades Professions: Electrical
	NCCER Core Curriculum + Level 1 HVAC Certification	Construction Maintenance Professions: HVAC
	NCCER Core Curriculum + Level 1 Industrial Maintenance Certification	Construction Maintenance Professions: Industrial Maintenance
	NCCER Core Curriculum + Level 1 Masonry Certification	Construction Trades Professions: Masonry
	NCCER Core Curriculum + Level 1 Plumbing Certification	Construction Trades Professions: Plumbing
	NCCER Core Curriculum + Level 1 Welding Certification	Construction Maintenance Professions: Welding
Consumer Services, Hospitality, & Tourism	Barber License	Barbering
	Certified Fundamentals Cook (CFC) Certification	Culinary Arts
	Certified Fundamentals Pastry Cook (CFPC) Certification	Culinary Arts, Baking and Pastry Arts
	Cosmetology License	Careers in Cosmetology
	National ProStart Certificate of Achievement	Food and Beverage Management
Environmental, Agricultural, & Natural Resources	Certified Professional Horticulturalist (CPH) Certification	Horticultural Services
Health & Biosciences	Certified Clinical Medical Assistant (CCMA) Certification	Academy of Health Professions—Clinical Medical Assistant
	Dental Assisting Certification	Academy of Health Professions—Dental Assisting

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[19] Note: This list of offered credentials was provided to Education Strategy Group from the Baltimore City Schools College and Career team and is current as of the 2018-19 school year.

Career Cluster	Industry-Recognized Credential	Program(s) of Study
	Geriatric Nursing Assistant GNA	Academy of Health Professions—Certified Nursing Assistant
	Pharmacy Technician Certification—ExCPT Exam	Academy of Health Professions—Pharmacy Technician
	Pharmacy Technician Certification—PTCB Exam	Academy of Health Professions—Pharmacy Technician
Human Resource Services	Child Development Associate Certification	Early Childhood Education
	Emergency Medical Responder (EMR) Certification	Fire, and Emergency Medical Training/High School Cadet
	Emergency Medical Technician (EMT) Certification	Fire, and Emergency Medical Training/High School Cadet
	ESRI ArcGIS Desktop Certification	Homeland Security & Emergency Preparedness— Information/ Communications Technology
	Fire Fighter I Certification	Fire, and Emergency Medical Training/High School Cadet
	Fire Fighter II Certification	Fire, and Emergency Medical Training/High School Cadet
	Geographic Information System (GIS) Certification	Homeland Security & Emergency Preparedness— Information/ Communications Technology
	Hazardous Mat Material Operations Certification	Fire, and Emergency Medical Training/High School Cadet
	ParaPro	Teacher Academy of Maryland
	PraxisCORE	Teacher Academy of Maryland
	Rescue Tech—Site Ops Certification	Fire, and Emergency Medical Training/High School Cadet
	Rescue Tech—Vehicle and Machinery Extraction Certification	Fire, and Emergency Medical Training/High School Cadet
	Truck Company Fireground Operations Certification	Fire, and Emergency Medical Training/High School Cadet
Information Technology	Cisco CCENT	IT Networking Academy CISCO—all specializations
	Cisco CCNA RS	IT Networking Academy CISCO—all specializations
	Cisco CCNA Security	IT Networking Academy CISCO—all specializations
	Cisco Cyber Ops	IT Networking Academy CISCO—all specializations
	CompTIA A+	IT Networking Academy CISCO—all specializations
	CompTIA Linux+	IT Networking Academy CISCO—all specializations
	CompTIA Network+	IT Networking Academy CISCO—all specializations
	NAF-Track Certification	Academy of Information Technology—all specializations
	NDG Linux Essentials	IT Networking Academy CISCO—all specializations
	Oracle Database Foundations Junior Associate Certification	Oracle Academy—Database Management
	Oracle Java Foundations Certified Junior Associate Certification	Oracle Academy—Java Programming
Manufacturing, Engineering & Technology	NIMS CNC Milling: Operations Certification with Measurement, Materials & Safety Exam	Manufacturing Engineering Technology—all specializations

Career Cluster	Industry-Recognized Credential	Program(s) of Study
	NIMS CNC Milling: Programming Setup & Operations Certification with Measurement, Materials & Safety Exam	Manufacturing Engineering Technology—all specializations
	NIMS CNC Turning: Operations Certification with Measurement, Materials & Safety Exam	Manufacturing Engineering Technology—all specializations
	NIMS CNC Turning: Programming Setup & Operations Certification with Measurement, Materials & Safety Exam	Manufacturing Engineering Technology—all specializations
	NIMS Drill Press Skills I Certification with Measurement, Materials & Safety Exam	Manufacturing Engineering Technology—all specializations
	NIMS Grinding Skills I Certification with Measurement, Materials & Safety Exam	Manufacturing Engineering Technology—all specializations
	NIMS Turning Operations: Turning Between Centers Certification with Measurement, Materials & Safety Exam	Manufacturing Engineering Technology—all specializations
	NIMS Turning Operations: Turning Chucking Skills Certification with Measurement, Materials & Safety Exam	Manufacturing Engineering Technology—all specializations
Transportation Technologies	Automatic Transmission/Transaxle Student Certification	Automotive Technology Maintenance and Light Repair-Plus
	Brakes Student Certification	Automotive Technology Maintenance and Light Repair-Plus, Medium/Heavy Truck-Diesel
	Diesel Engines Student Certification	Medium/Heavy Truck Technician-Diesel
	Electrical/Electronic Systems Student Certification	Automotive Technology Maintenance and Light Repair-Plus, Medium/Heavy Truck-Diesel
	Engine Performance Student Certification	Automotive Technology Maintenance and Light Repair-Plus
	Engine Repair Student Certification	Automotive Technology Maintenance and Light Repair-Plus
	Heating and Air Conditioning Student Certification	Automotive Technology Maintenance and Light Repair-Plus
	I-CAR Platinum Certificate	Autobody/Collision Repair Technician
	Maintenance and Light Repair Student Certification	Automotive Technology Maintenance and Light Repair-Plus
	Manual Drive Train and Axles Student Certification	Automotive Technology Maintenance and Light Repair-Plus
	Painting and Refinishing Student Certification	Autobody/Collision Repair Technician
	Structural Analysis and Damage Repair Student Certification	Autobody/Collision Repair Technician
	Suspension and Steering Student Certification	Automotive Technology Maintenance and Light Repair-

Career Cluster	Industry-Recognized Credential	Program(s) of Study
		Plus, Medium/Heavy Truck-Diesel

Appendix E: Programs of Study by CTE Career Cluster

Cluster	Pathway
Arts, Media, & Communications	Graphic Communications (PrintED)
	Interactive Media Production
Business Management & Finance	Accounting & Finance
	Business Administrative Services
	Business Management
Career Research & Development	Career Research & Development
Construction & Development	Construction Design and Management
	Construction Maintenance NCCER (Welding)
	Construction Trades NCCER (Carpentry)
	Construction Trades NCCER (Electrical)
	Construction Trades NCCER (Masonry)
Consumer Services, Hospitality, & Tourism	Careers in Cosmetology
	Commercial Banking
	Cosmetic Services
	Fashion Design
	Food & Beverage Management (ProStart)
	Lodging Management Program
Environmental, Agriculture, & Natural Resources	Curriculum for Agriculture Science Education (CASE)
	Environmental Studies & Natural Resources
Health & Biosciences	Academy of Health Professions (Dental Assistant)
	Academy of Health Professions (Nursing Assistant)
	Academy of Health Professions (Pharmacy Tech)
	Academy of Health Professions (Surgical Tech)
	Biomedical Sciences (PLTW)
Human Resource Services	Early Childhood Education/Child Care
	Emergency Medical Tech
	Fire Fighter & EMT (MFRI)
	Homeland Security & Emergency Preparedness (Criminal Justice)
	Homeland Security & Emergency Preparedness (GIS)

	Law & Leadership
	Teacher Academy of Maryland
Information Technology	Computer Science
	Information Support & Services
	IT Database (Oracle Academy)
	IT Networking Academy (CISCO)
Manufacturing, Engineering, & Technology	Manufacturing Technologies
	Pre-Engineering (PLTW)
Transportation Technologies	Automotive Tech
	Autobody Collision Repair Tech
	Sea Going

Note: City Schools' two PTECH programs were excluded from this report's analysis.