MONTGOMERY COUNTY PUBLIC SCHOOLS

CAREER READINESS | EXTERNAL REVIEW

Preparing All Students for Economic & Career Success

SEPTEMBER 2017

ESG Education Strategy Group
ACHIEVING GREATER IMPACT

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Executive Summary

The goal of K-12 education has long been to prepare students effectively for life after high school, but what is meant by postsecondary success has shifted significantly in recent years. The economy has changed; college has changed; and career opportunities have changed. In the next few years, nearly two-thirds of all jobs with require some level of postsecondary education and training, which will provide significantly more and better opportunities to skilled, technical, postsecondary-credentialed workers and leave behind those with a high school diploma or less. That does not mean only individuals with bachelor's degrees with find success in the job market. Those who hold associate degrees in technical fields in many instances already out-earn their peers with bachelor's degrees in non-quantitative fields. Choices students make regarding their path of study after high school have never been more important.

The focal point of K-12 schools must correspondingly shift from "how do we prepare students for four-year college?" to "how do we prepare students to earn a postsecondary credential that gives them entry into the middle class and beyond?"

These economic realities compelled Montgomery County Public Schools (MCPS) to contract with Education Strategy Group (ESG) to help the district reflect on its current practices, assess how well they are meeting the intended mark, and develop strategies for course correction. ESG was asked to rigorously assess the district's career readiness efforts to determine the degree to which they are driven by labor market needs; shaped by employers; rigorous and relevant; fully utilized and effective vehicles for preparing all students for the full range of high-quality postsecondary options before them.

Several important principles guided ESG's work throughout the project:

- Every student must graduate from MCPS with the knowledge and skills to be ready for college and "good jobs."
- Career readiness refers to a broad set of experiences that prepare all students for economic and career success; Career and Technology Education (CTE) is an important lever, but not the sole focus of, a comprehensive career readiness strategy.
- Career readiness efforts are not about tracking students into one path but rather about preparing all students for the full range of postsecondary options from which they can choose their best fit.
- MCPS cannot tackle this work alone; it must lock arms with the employer and postsecondary education communities to prepare students for economic and career success.

Through analysis of performance data and administration of surveys, focus groups, and phone interviews involving students, parents, staff, employers, and higher education leaders, ESG formed findings about the strengths and gaps of current practices and strategic recommendations for improvement. They are organized below into five focus areas to allow for the integration and prioritization of key themes and ideas.

Focus Area #1: Vision and Systemic Priorities for Career Readiness

District administrators and school-based staff within MCPS are clearly committed to high expectations and outcomes for all students. However, those high expectations are almost exclusively aimed at a four-year college experience after high school, which, while very important, marginalizes career preparation efforts and undervalues dual college-ready AND career-ready accomplishments. The strong focus on preparing for four-year college has also contributed in part to a practice of checking off graduation requirements rather than thinking more strategically and creatively about what can and should be included within the high school experience. System drivers and accountability metrics within MCPS continue to emphasize raising the graduation and four-year college-going rates. Absent from those and related metrics are high-quality career readiness indicators that can and should play a complimentary role in MCPS's work.

Recommendations: MCPS must partner with industry and postsecondary leaders to establish career readiness as a priority in preparing students for postsecondary success.

- ***Establish a new vision for career readiness*** that complements MCPS's college-ready goals.
- ***Redefine and rebrand CTE*** as offering rigorous academic coursework integrated with 21st century technical instruction and real-world work experiences.
- ***Provide professional development on the regional labor market*** and the related high-value career opportunities to teachers, counselors, and administrators to help them understand the range of meaningful professional roles available after high school.
- ***Establish metrics for career readiness success*** to undergird the importance of the work, including program of study completion in high-skill, high-demand fields; work-based learning participation; dual credit rates; and attainment of industry-recognized credentials with labor market value.

Focus Area #2: Employer Engagement

MCPS clearly recognizes the need to meaningfully engage key employers to ensure alignment between programs and the economic development needs of the county, yet it lacks a systemic way in which to connect with the employer community. Instead, existing intermediary organizations serve different purposes and functions, which has created fragmented engagement and confusion among employers. While MCPS consistently engages employers through several channels, employers feel they are being informed rather than helping to shape and assess policies and programs. In addition, employers are underutilized in connecting classroom learning with the world of work through work-based learning experiences. This could stem from the way in which employers seem to perceive K-12 as a philanthropic endeavor rather than a talent-development strategy.

Recommendations: Employers must become strong partners in realizing MCPS's new vision of career readiness, which includes having the opportunity to help identify programs of study that should be prioritized and scaled and assess their effectiveness.

- ***Regularly convene leading employers*** through a specialized Advisory Council led by the Superintendent to identify programmatic priorities for the district and set direction for the work of the current intermediary organizations.
- ***Restructure and redefine the role of the Montgomery County Collaboration Board (MCCB)*** so it can more effectively ensure that career preparation programs are targeted in the right career sectors and are achieving results.
- ***Establish a single point of contact within MCPS for employers,*** a "Director of Strategic Industry Partnerships", to manage the work of the Council and build a full portfolio of work-based learning experiences for students.

Focus Area #3: Quality and Rigor of CTE

MCPS should rightfully boast that it has programs of study that are anchored in industry-recognized credentials; a technical career advisement platform; school-based internship coordinators; and dedicated staff, all of which are needed to create a high-quality, district-wide career preparation system. Yet its programs of study are offered unevenly across the district with a smorgasbord popping up within schools seemingly without intentionality. This contributes to students and parents often perceiving CTE as having limited value. High-quality programs of study must include postsecondary-level instruction, but the shared vision for a 9-14 delivery system that includes dual enrollment/credit and opportunities for attainment of postsecondary-level industry-recognized credentials is underdeveloped. Further, neither work-based learning nor career advisement has been optimized to date. Though the high school internship program has impressive potential, it lacks coordination, clear standards, and industry-aligned opportunities. And, important functionality of Naviance for career planning is currently overlooked. Finally, as a contextual challenge to address, CTE is inherently at a disadvantage for enrollees. It is often viewed as one elective of many choices rather than a pathway to a valuable postsecondary opportunity.

Recommendations: Once the new vision for career readiness has been established, MCPS must strengthen the quality and consistency of its career programming. The district needs to ensure that programs of study are rigorous and enable students to graduate with college credit and postsecondary-level industry-recognized credentials.

- ***Design and execute a systematic approach*** to the delivery of career programming across schools ensuring that every student has access to a high-quality program of study of his/her choice.
- ***Redesign Programs of Study*** so that they offer honors and college-level course-taking opportunities through grade 14 and integrate rigorous and relevant work-based learning

experiences.

- ***Reorganize CTE under one central leader*** with deep knowledge of the district's academic and technical priorities and the acumen to execute on the new career readiness vision.
- ***Reconfigure the district's accountability system*** so that it drives changes in practice that value completion of programs of study and attainment of college credit and stackable credentials.

Focus Area #4: The Edison School of Technology

The Edison School of Technology ("Edison") in its current form consistently demonstrates a relentless focus on preparing students for specific career opportunities after high school. Staff at Edison are notably dedicated to their work and readily acknowledge and support the notion that many of their students can, should, and do enroll in formal postsecondary education or training programs after high school. However, Edison is largely unknown throughout MCPS with stakeholders holding only a vague idea of what the school does and how well it does it. Stakeholders express concern that it is a "lesser-than option" for students who don't plan to go to college. Students and parents seem largely unwilling to lose a class period daily to travel to a part-time program that offers a partial high school experience. And there doesn't appear to be a common understanding of how Edison fits into the broader MCPS strategy.

Recommendations: The "new Edison" currently under construction makes room for change and reinvention. MCPS should take this opportunity to address shortcomings in the current model, situating the new school as an integral piece of the career readiness vision. There are four paths to consider, each of which requires converting Edison into a full-time school:

- ***Create a CTE Early College High School*** that, like other Early College High Schools, would enable students to simultaneously earn a high school diploma and either an associate degree or up to two years of credit toward a bachelor's degree.
- ***Design a Wall-to-Wall Career Academy*** that would be divided into a number of high-skill, high-demand "academies"; each student would "major" in an academy and receive rigorous academic and technical instruction culminating in college-credit and a postsecondary industry-recognized credential.
- ***Combine Edison and Wheaton,*** taking advantage of the natural opportunity of side-by-side campuses to offer a rigorous project-based learning experience alongside sophisticated hands-on technical instruction.
- ***Convert to a technology high school*** taking care to assess programmatic offerings and their quality carefully to ensure high-quality and develop a strategic plan for implementation with postsecondary and industry partners.

Focus Area #5: Stakeholder Understanding

MCPS students, parents, faculty, and staff uniformly understand and believe in the value of a four-year college degree. But across all MCPS stakeholders, there is little awareness of how economic shifts have created a more diverse range of career opportunities, especially valuable "new-collar" jobs like those in the health and financial services fields. Relatedly, because little information on career preparation for these opportunities has made its way to students, teachers, counselors, and parents, there is a discernible lack of understanding regarding career readiness and its goals. Most stakeholders don't understand what CTE is, often associating it with outdated vocational education. Yet they cite CTE programs of study like National Academies Foundation (NAF), Project Lead the Way (PLTW), and Cisco as being very strong college prep opportunities. Students, parents, faculty, and staff generally lack understanding of how high-quality CTE can be an effective strategy to prepare kids for college.

Recommendations: Leveraging external professionals, MCPS must clearly and widely communicate to help stakeholders understand the importance of its career readiness work. This can happen through deliberate phasing:

- ***Establish a new value proposition for career readiness*** that educates stakeholders on recent economic changes and the related implications for career opportunities.
- ***Implement a branding campaign*** that brings to life MCPS's new career readiness vision that integrates and values career preparation alongside college preparation.
- ***Make the case for high-quality CTE as a component of career readiness*** explaining what CTE entails, delineating CTE offerings and their connection to postsecondary options, targeting long-held misconceptions about CTE quality, and advertising recent CTE changes to ensure unassailable quality.

INTRODUCTION
The Shifting Landscape of Economic Opportunities

For generations, the route to economic and career success was simple and direct: graduate from high school and find a blue-collar technical job or white-collar clerical role, each of which provided stable employment and paid good wages; or, go on to earn a college degree that opened doors to a wide range of substantial, well-paying professional positions. For today's students, that reliable sequence no longer holds true. Technological advances have fundamentally reshaped the economy, and at the same time, triggered changes in the landscape of postsecondary education and career opportunities.

Today, the same skilled trade roles require workers to have new, more sophisticated proficiency to be successful in the workforce. Car mechanics have become computer technicians; assembly line workers have become high-tech operators; and programmers have become the backbone of our economic infrastructure. In fact, American manufacturers now post more jobs for software developers than production workers.[1]

The loud, clear drumbeat that a college education is the key to economic and career success has been proven true by these developments. Employers' upgraded job expectations mean that workers must be more skillfully prepared for the range of roles available in the 21st century economy. By 2020, nearly two-thirds of all jobs will require some level of postsecondary education and training, with a nearly even split between those requiring a bachelor's degree and those requiring an associate degree or some postsecondary training.[2] Many of these are "middle skill" or "new collar" jobs that require more than a high school diploma but less than a bachelor's degree.

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But there are two critical factors missing from this description that must impact the work of schools: 1) these changes are occurring very rapidly within the American economy; and 2) postsecondary success is being defined much more broadly by the economy than it traditionally has. The Great Recession of 2008-2009 decimated clerical and blue-collar jobs, replacing them with higher-skill managerial and professional jobs in industries such as health and financial services. In fact, 99 percent of the jobs added in the Recovery went to workers with some level of postsecondary education and training, leaving behind those with a high school diploma or less.[3]

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[1] Burning Glass Technologies, "Manufacturing Shift: Software Jobs Now Outpace Production Openings", (August 15, 2017).

[2] Carnevale, Smith, and Strohl. "*Recovery: Job Growth and Education Requirements through 2020*", Georgetown University Center on Education and the Workforce (June, 2013).

[3] Carnevale, Jayasundera, and Gulish. "*Recovery: College Haves and Have Nots*", Georgetown University Center on Education and the Workforce (June, 2016).

While employer demand for postsecondary-trained workers has increased significantly, the challenges of college continue to grow for students and their families. Costs have risen prohibitively with the average in-state four-year public higher education institution charging $20,000 *per year* and the average private, non-profit four-year college charging $45,000 *per year*.[4] Yet only 10 percent of students who earn a bachelor's degree do so within four years, and on average, students accumulate $37,172 of debt for a four-year college experience.[5] Perhaps not surprisingly, more than 70 percent of undergraduate students hold jobs while in college, with 40 percent working more than 30 hours per week irrespective of family income, financial dependency, enrollment status, age, race, or other demographic characteristics.[6] The traditional vision of postsecondary education – 18 year old students completing a bachelor's degree in four years – is now the exception, not the norm.

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The economy has shifted to value shorter-term, meaningful credentials in technical fields in addition to four-year degrees. While bachelor-degreed electrical engineers for example still earn on average nearly $100k per year, those with associate degrees in Information Technology on average earn over $66k per year, and one-year industry certificate holders in Information Technology on average earn about $59k per year.[7] Both IT specialists exceed the generic bachelor degree holder who earns an average salary of $54k per year.[8] In fact, across the board, 30 percent of associate degree holders now out-earn those with bachelor's degrees.[9]

While students can succeed in their futures in similar ways whether they attain long-term postsecondary or industry certifications, associate degrees, or bachelor's degrees, the general rule of thumb persists: the more education one has, the higher the salary he/she earns. ***However, the fields students choose to study matter***. Associate degree holders in technical fields often make more money than bachelor's degree holders in less quantitative fields. Liberal Arts and General Business majors are two to three times more likely to be underemployed – that is, hold jobs for which they are over-qualified – than those with Nursing or Engineering majors.[10]

Finally, these conditions - the rising costs of higher education, the longer time to earning a college degree, the higher numbers of students working to help pay their way through college, and the

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[4] College Board, "Trends in College Pricing 2016" (October, 2016).

[5] Friedman, Zack. "Student Loan Debt in 2017: A $1.3 Trillion Crisis", Forbes (February, 2017).

[6] Carnevale, Smith, Melton, Price. "*Learning While Earning: The New Normal*", Georgetown University Center on Education and the Workforce (2015).

[7] PayScale Human Capital, www.payscale.com

[8] "Learning While Earning: The New Normal", ibid.

[9] "Learning While Earning: The New Normal", ibid.

[10] Abel and Deitz. "Underemployment in the Early Careers of College Graduates Following the Great Recession", The National Bureau of Economic Research (September, 2016).

increasing numbers of job opportunities for those with credentials beyond a high school diploma but less than a bachelor's degree – have given rise to a new approach to economic and career success, one that values and enables life-long learning. Career paths built on stackable credentials – or credentials that build on one another over time and allow students to grow their skills, experience, and qualifications step by step for successively higher job opportunities – are enabling young adults to achieve economic and career success at a steady pace and with little debt. According to a new report from the National Student Clearinghouse, nearly two-thirds of students who earned associate degrees in the 2010-2011 school year went on to enroll in a four-year college or university, and 41 percent of them earned a bachelor's degree.[11]

It is clearly a new time in the American economy, one that calls on states, districts, and schools to reflect on current practices, assess how well they are meeting the intended mark, and determine where course correction is needed.

[11] "Snapshot Report: Certificate and Associate Degree Pathways", National Student Clearinghouse (July, 2017).

Career Readiness Review Undertaken by ESG

In 2014, ESG facilitated the Council of Chief State School Officers' (CCSSO) Career Readiness Task Force, which resulted in a far-reaching set of recommendations intended to serve as a blueprint for state and local efforts to design course corrections to make their systems of career preparation responsive to this shift in economic conditions. The Maryland State Department of Education became an early endorser of those recommendations, and MCPS subsequently affirmed them as the foundation of its 2015 Career Readiness Improvement Plan.

That MCPS Career Readiness Improvement Plan called for a review of current career preparation practices to determine the extent to which programs of study and related efforts are demand-driven, informed by employers, rigorous and relevant, fully utilized, and effective vehicles for preparing students for postsecondary success. MCPS contracted with ESG in early 2017 to perform that review to identify strengths and gaps of those current efforts to form comprehensive recommendations for improvement and scale. Between January and June, 2017, ESG interviewed key MCPS staff members; analyzed performance data of MCPS; compared those findings against demographically similar districts within and beyond Maryland; administered surveys to staff, students, parents, and employers; conducted focus groups of students, staff, parents, employers; and interviewed key leaders from local business and postsecondary education communities. Descriptions of each work stream and corresponding findings are provided below.

Data Analysis and Focus Group Descriptions

ESG began its work with MCPS with an analysis of the district's Career and Technology Education (CTE) programmatic and performance data as well as comparison data from other districts based on three broad frames:

1. How has CTE program of study enrollment changed over time? To what extent does that reflect the district's priorities? To what extent does that mirror or stand in contrast to trends in other Maryland districts?
2. How do CTE Concentrators and Completers fare across a broad spectrum of performance metrics as compared to all graduates in the district? How has that performance changed over time?
3. How does the performance of CTE Concentrators compare to benchmark districts within Maryland and nationally?

As a result, ESG's quantitative analysis consisted of three parts:

- **MCPS Performance Analysis:** Longitudinal review of MCPS enrollment by program of study, performance of CTE Concentrators/Completers, postsecondary transitions of CTE Completers, CTE teacher credentials, and student internship engagement
- **Maryland Cross-District Benchmarking**: Comparison of CTE enrollment and Carl D. Perkins Career Technical Education Act ("Perkins") accountability measure trends
- **National District Benchmarking:** National cross-district comparison of Perkins performance and additional data, where available

Data Requested and Received

Upon execution of the contract for services, Montgomery County Public Schools and Education Strategy Group entered into a data-sharing agreement for aggregate-level data to answer the following policy questions:

1. Which programs of study – coherent, non-duplicative sequence of courses within a designated subject area - are offered at each high school in MCPS?
2. What is the total enrollment of secondary students in MCPS disaggregated by subgroup? What is the total enrollment of CTE students in MCPS disaggregated by subgroup? Of those who have participated in CTE, which students, disaggregated by subgroup, went on to earn concentrator or completer status?
3. Which students, disaggregated by subgroup, have earned concentrator status in a program of study at each high school? Which students at each high school, disaggregated by subgroup, have completed a program of study? Of the students who participated in a program of study, who (disaggregated by subgroup) went on to complete that program of study?

4. Which concentrators or completers, disaggregated by subgroup, have earned dual enrollment credit as part of their program of study? Which concentrators or completers, disaggregated by subgroup, have earned an industry-recognized credential as part of their program of study? Which concentrators or completers, disaggregated by subgroup, have also earned AP and/or IB credit? Which concentrators or completers, disaggregated by subgroup, have demonstrated proficiency on state assessments (English, mathematics, biology and government)?
5. What are the postsecondary education enrollment rates of concentrators and completers? Of those, how many demonstrate readiness for credit-bearing coursework as concluded by the Student Outcome and Achievement Report of the Maryland Higher Education Commission?
6. Which schools offer project-based learning (PBL), and what percentage of students, disaggregated by subgroup, participate? Of those PBL experiences, which are aligned with high-skill, high-demand sectors?
7. Of those who were concentrators or completers of a program of study, who (disaggregated by subgroup) found employment in a high-skill, high-demand field within 12 months after high school graduation?
8. Of those who were concentrators or completers of a program of study, which students, disaggregated by subgroup, enrolled in registered apprenticeships within 12 months after high school graduation?
9. What is the number and percentage of teachers of program of study courses that have earned industry-recognized credentials in the field they currently teach?

MCPS provided data files via a secure file transfer site to facilitate ESG's analysis that included:

- Perkins performance data
- CTE Enrollee, Concentrator, and Completer by career cluster
- % Proficient on HS ELA and Math assessment, % Earned Dual Enrollment Credit, % Earned Industry-recognized credential, % Scored 3+ on AP, % Scored 4+ on IB, % Enroll in Postsecondary by CTE Concentrator, CTE Completer and HS Graduate

Unfortunately, due to data system limitations, the district was not able to provide data for ESG to accurately report findings on:

- Participation in project-based learning experiences;
- Employment of CTE Concentrators or Completers in a high-skill, high-demand field within 12 months after high school graduation;
- Enrollment of CTE Concentrators or Completers in a registered apprenticeship within 12 months after high school graduation; and,
- Teachers of CTE pathway courses that have earned industry-recognized credentials in the field they currently teach.

To provide context to the district's performance, MCPS requested that ESG collect information where available on CTE enrollment and performance in similarly-sized districts in Maryland. ESG requested CTE enrollment and performance data from the five other largest districts in Maryland, namely: Anne Arundel, Baltimore County, Frederick, Howard, and Prince George's. For these districts, ESG received Perkins performance data as well as CTE Enrollee, Concentrator, and Completer data by career cluster.

Additionally, on behalf of MCPS, ESG made direct inquiries for performance data from 11 school districts across five states to provide national comparisons: Sacramento, CA; Long Beach, CA; Duval County, FL; Lee County, FL; Palm Beach County, FL; Cobb County, GA; Gwinnett County, GA; Charlotte-Mecklenburg, NC; Wake County, NC; Fairfax County, VA; and, Prince William County, VA. The districts were selected based on similarity to MCPS in student enrollment size and demographics, and general geographic makeup. ESG requested data from the districts and their respective state education agencies but received sparse information. Perkins performance data were collected for all comparison districts; however, it should be noted that each state defines its Perkins accountability measures in different ways, and use different assessments to gauge that performance. For instance, in one state Academic Attainment in mathematics was based on passage of an Algebra I assessment, whereas in others it is based off of an 11th grade assessment with proficiency set at the college- and career-ready level.

Furthermore, ESG was able to obtain some performance data for CTE students from the benchmark districts, yet in nearly every instance, there were significant data collection and organization issues within the state that prevented sharing the full set of requested data. It should also be noted that in two instances, Delaware and Florida, requested data were available, but to access that information would have required paying for an analyst's time in that state agency to produce the data. MCPS declined that option.

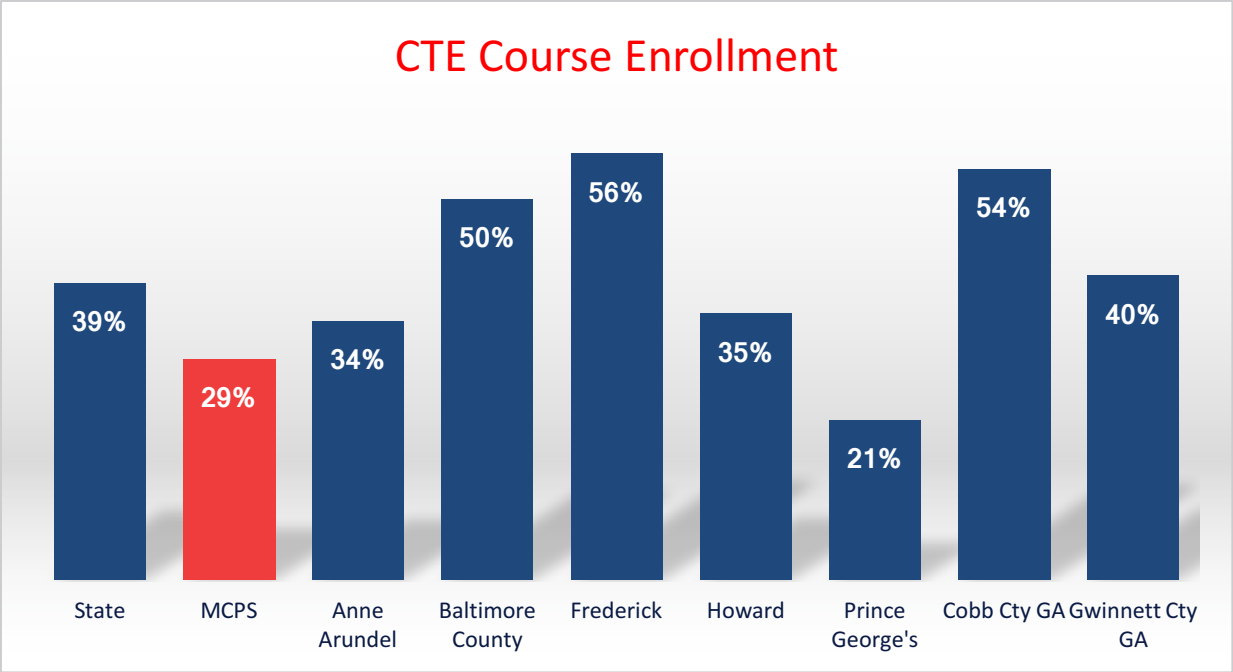
CTE enrollment in Montgomery County is below the state average, and has remained so for the past three years.

Key Quantitative Data Analysis Findings

The following summarizes the key findings from ESG's analysis of MCPS and other district/state data.

CTE Course Enrollment in MCPS Lags

CTE enrollment in Montgomery County is below the state average, and has remained so for the past three years. During the 2015-16 school year, 29% of all students were enrolled in at least one career technical education course in MCPS, which trailed the state rate of 39%. Four of the five analyzed Maryland comparison school districts outpaced MCPS in CTE enrollment: Anne Arundel (34%), Baltimore County (50%), Frederick (56%), and Howard (35%). Only Prince George's, at 21%, trailed MCPS among in state comparison districts. Additionally, both Cobb (54%) and Gwinnett (40%) counties in Georgia enrolled more students in CTE in 2015-16 than MCPS. Over the past three years, CTE enrollment has risen slightly across each Maryland comparison district, and the state overall, with Baltimore County showing the greatest increase from 38 to 50% enrollment. Over those same years, MCPS enrollment has declined by 1 percentage point each year.



When viewed across a students' tenure in high school, more than half (55%) of all MCPS students enroll in at least one CTE course. For 2016, enrollment in CTE by graduating students ranged across the county from 13% at Walter Johnson High School to nearly 95% at Magruder High School and 100% at Thomas Edison School of Technology.

CTE Program of Study Enrollment in MCPS is Not Keeping Up with Peer Maryland Districts

Over the past three years, total MCPS student enrollment has grown by approximately 4%. Yet, CTE enrollment has declined by approximately 5%. Among similar-sized districts in Maryland, MCPS is the only district with declining CTE enrollment. Each of the five comparison districts demonstrated increases in CTE enrollments from 2013-14 to 2015-16, ranging from 2% in Anne Arundel to 31% in Baltimore County.

Notably among programs of study, MCPS saw large enrollment declines in the Business Management & Finance and Information Technology pathways, with both experiencing greater than 30% declines. Based on enrollment change in other programs of study, it does not appear that this is the result of year-to-year differences in the way in which course participation in particular pathways is input into the district's data system; however, that cannot be ruled out completely.

Manufacturing, Engineering & Technology and Business Management & Finance account for nearly half of all CTE enrollments in MCPS. This is similar to enrollments in Baltimore, Frederick, and Prince George's counties. Over the past three years, the share of CTE student enrollments by program of study has remained relatively stable. The only notable shift has been a decrease in Business Management & Finance (from 17 to 12% of all CTE enrollments) and increase in Human Resource Services (from 16 to 22%).

Few Students in MCPS Complete Programs of Study

Very few students ultimately Concentrate or Complete CTE programs of study in the district. Of the 2016 graduates, only 18% were CTE Concentrators and 10% were CTE Completers. Wheaton High School had the highest percentage of concentrators and completers at 48% and 40%, respectively. Eight of the 25 highs schools in the district had fewer than 5% of graduates that were CTE Completers. While 100% of students at Edison participated in CTE (as expected), only 80% Concentrated in and 50% Completed a CTE program of study. CTE program of study completion is a particular issue when compared to the performance of other Maryland districts, as MCPS lags behind all of those analyzed for this study: Anne Arundel (12.8%), Baltimore County (24.5%), Frederick (24.5%), Howard (18.1%), and Prince George's (10.4%).

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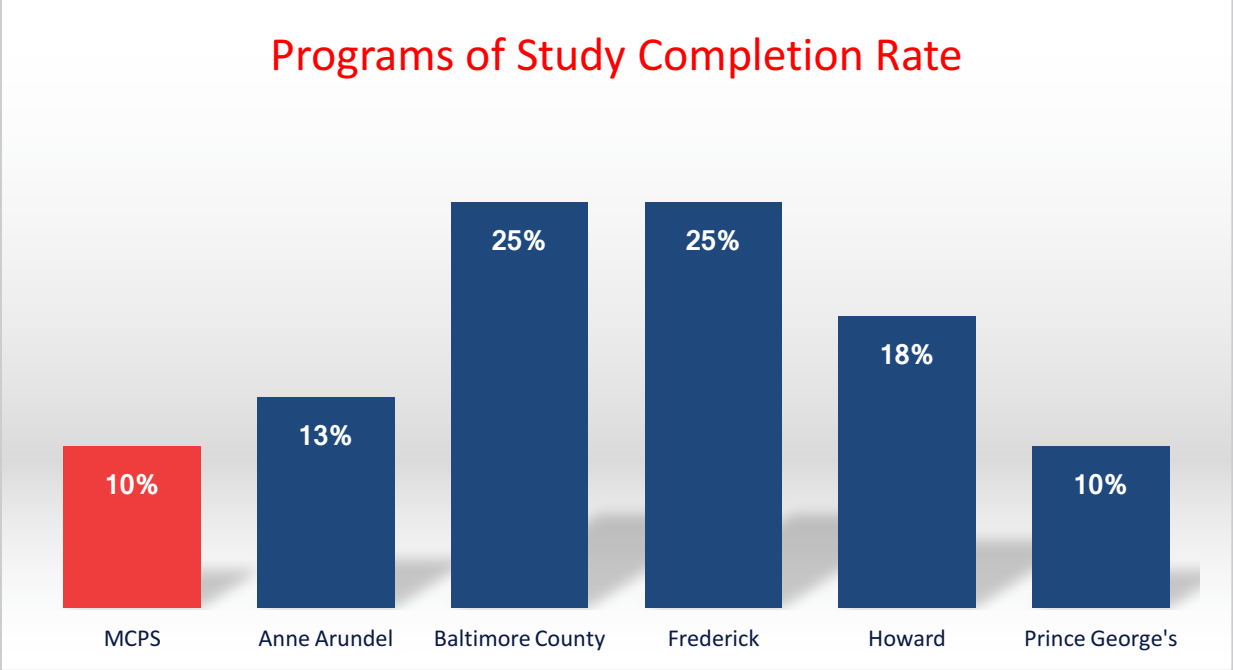

CTE Concentration and Completion varied considerably by program of study in MCPS. Of the nearly 2,000 graduates who were CTE Concentrators, the top five pathway areas were: College and Career Research and Development (16% of total Concentrators); Business Management and Finance (16%); Education, Training, and Child Studies (13%); Engineering, Scientific Research, and Manufacturing Technologies (12%); and, Information Technologies (11%). The Environmental, Agricultural and Natural Resources pathway had the fewest Concentrators with only 22 students (or 1% of total Concentrators). While nearly a quarter of graduates enrolled in a CTE course in Manufacturing, Engineering and Technology pathway, only 10% of those students ultimately concentrated in the pathway.

Students in the College and Career Research and Development pathway had both the highest number of completers and the highest percent of concentrators that completed (84%). Despite making up the greatest proportion of Concentrators, only 35% of those students that concentrated in the Business

Management and Finance pathway completed. In total, 53% of students that were CTE Concentrators became CTE Completers prior to high school graduation.

CTE Students Perform Lower than Their Peers on Nearly All College and Career Ready Performance Metrics in MCPS

When compared to MCPS graduates overall, CTE Completers score lower on nearly all other student performance metrics, and those gaps are consistent across subgroups.

When compared to MCPS graduates overall, CTE Completers score lower on nearly all other student performance metrics, and those gaps are consistent across subgroups. For instance, 65% of all MCPS graduates earned a C or better in Algebra 2, while only 48% of CTE Completers did. For the 2015-16 school year, the gaps between these students range from less than 1 percentage point for earning dual enrollment credit to over 23 percentage points for earning a score of 3 or better on an Advanced Placement exam. The gaps are relatively consistent over the past three years.

The one area where CTE Completers outperform their peers is in earning industry-recognized credentials. As these students have more opportunities to earn certificates than students that have not completed a program of study, this result is to be expected. For 2015-16, nearly 30% of CTE Completers have earned an industry-recognized credential upon graduation, as compared to just 6% for all MCPS graduates.

Few Students Take Advantage of non-AP College and Career Readiness Opportunities that May Provide a Leg-Up on Postsecondary Education

Beyond Advanced Placement, few students take advantage of early opportunities to gain postsecondary credit, career certificates, or exposure to work, regardless of CTE enrollment. Across all students in MCPS, only 4.6% of 2016 graduates earned dual credit, 6.4% earned an industry-recognized credential, 7.1% scored 4+ on an International Baccalaureate assessment, and 20% engaged in an internship. Other than industry credentials (as mentioned above), the rates are slightly lower for CTE Completers across the indicators.

This information bears out when analyzing the percent of students who enroll in some form of postsecondary education after high school graduation. Nearly 73% of MCPS graduates enroll, yet only 63% of those who were a CTE Completer do so. The gap is particularly stark for White students, as 82% of all graduates and 59% of CTE Completers successfully transition, a gap of 23 percentage points. At Bethesda-Chevy Chase, Clarksburg, Montgomery, and Whitman the gap between all graduates and CTE Completers in terms of postsecondary enrollment is over 40 percentage points.

MCPS Performs at Average Levels on Perkins Performance Indicators

When compared to similarly-sized Maryland school districts, MCPS performance on federally-required Perkins indicators falls in the middle of the pack. In 2016, MCPS was 3rd out of 6 districts on Academic Attainment – English; 4th for Academic Attainment – Math; 3rd for Technical Skill Attainment; 4th for

Post-High School Placement; 5th for Non-traditional Enrollment; and 4th for Non-traditional Completion. All comparison districts perform similarly well on the two Perkins graduation indicators. From 2014 to 2016, MCPS only missed state Perkins targets in the Dual Completion and Non-traditional performance categories.

Notably, Maryland requires districts to collect information on the percent of CTE Completers who also meet requirements for the University System of Maryland (e.g., Dual Completion). On this measure in 2016, MCPS was 5th out of 6 districts, with a rate of 31.3%, well below the state average of 58.1%. The district's performance on this measure has been below the state target for the past three years, and the district experienced a decline of approximately 25 percentage points from 2014 and 2015 performance. While not exactly similar requirements, Virginia also monitors the percentage of students completing their Advanced Diploma (which is also aligned to the entrance requirements of the state's university system). In Fairfax County, 56% of CTE Concentrators complete an Advanced Diploma as compared to 62% of all graduates. In Prince William 40% of CTE Concentrators complete an Advanced Diploma as compared to 48% of all graduates.

Limited CTE Performance Data Available in MCPS and Nationally

Through the review of MCPS and cross-district data, it is apparent that significant data challenges remain nationally to analyze CTE performance. In nearly every district (and their respective state) approached, CTE data are kept in a separate system from traditional performance measures. Trying to link that information was either (1) not possible or (2) placed significant burden on data staff such that it became infeasible within the scope of this project. Even within MCPS, the ability to collect and modify data to enable analysis and comparisons with non-CTE students took longer than anticipated and presented more challenges than expected with regard to the specific business rules to be used.

MCPS Stakeholder Survey Methodology

On behalf of MCPS, ESG conducted an online survey of students, parents, teachers/administrators, counselors, and business/industry representatives to learn more about their knowledge of and attitudes toward career readiness. The survey questions were developed with input from MCPS staff, and MCPS managed survey outreach to all stakeholders. The district provided two survey windows to increase response rates and ensure broad coverage from stakeholders across the district. A full list of questions for each group is available in Appendix B.

Survey Response Rate

The following table highlights the total number and response rates across the surveyed stakeholder groups. Students and parents responded to the survey in greater numbers than other stakeholders, with business/industry representatives providing the fewest responses. The response numbers are adequate for generalizing perceptions within and across groups (save for business/industry). However, deep comparative analysis of responses within subpopulations is unlikely to provide valid results as the survey (and accompanying methodology) was not intended to do so. In particular, survey response rates varied considerably from school to school, so ESG would caution against extrapolating too much from the responses by high school.

Stakeholder Group	# Completed	# Invited	% Completed
Teachers/Administrators	458	1247	36.7%
Counselors/CCIC	107	238	45%
Business and Industry	15	185	8.1%
Students (10 schools, 16 classes)	2372	2400	98.8%
Parents	880	16,293	5.4%

Key Survey Findings

Strong Agreement that Students Must Continue Their Education and Training Beyond High School

There is consensus across all surveyed groups (83-91%) that students must continue their education and training beyond high school to have career advancement opportunities, yet there is differentiation among groups on the extent to which they "Strongly Agree" with the statement. Strongly Agree responses include: students – 62%; parents – 77%; teachers/administrators – 63%; and, counselors – 56%.

Knowledge about Future Economic Demands is Limited

There are gaps in knowledge across surveyed groups about projected degree needs. Approximately half of teachers/administrators and counselors are not aware or disagree with the statement that the US will need equal numbers of associate and bachelor's degree holders, despite that being the case.

CTE "Stigma" Exists in MCPS

The perception (or "stigma") that CTE is only for students not planning to enroll in postsecondary education does exist in the district. Nearly 20% of students or parents (and 10% of teachers/administrators and counselors) believe CTE is for students who don't plan to go to college. Further, only 57% of students believe completion of a CTE program of study allows students to enroll in a 4-year postsecondary option, and an additional 1/3 of students do not know whether that is the case. Fortunately, 80% of parents surveyed believe that CTE pathways open doors to postsecondary education.

Large Appetite for More Information about Career Preparation Opportunities

Eighty percent of students and parents want more information on career preparation programs in MCPS. Ninety percent of teachers/administrators and counselors believe staff need more information as well.

There is consensus across all surveyed groups that all involved parties could use more information about career preparation opportunities in MCPS generally, and at Edison School of Technology ("Edison") specifically. For example, more than 50% of students are not aware (i.e., Strongly Disagree, Disagree and Don't Know) of CTE program offerings, including those at Edison, and only 50% believe their counselor helps them understand the variety of career opportunities available after high school. Approximately 80% of students and parents want more information on career preparation programs in MCPS, and 90% of teachers/administrators and counselors believe staff need more information as well.

Desire to Attend Thomas Edison School of Technology is Low

Only about 15% of students indicate an interest in taking CTE courses at Edison as opposed to their local high school. The two main reasons that students suggest would increase their likelihood of attendance at Edison are the ability for full-time attendance and closer proximity to their home. Similarly, fewer than 10% of parents believe their child is interested in taking CTE courses at Edison.

Many Counselors Feel Unprepared to Assist Student Career Planning

A considerable number of counselors indicate unease about their preparation and knowledge to support student career planning. For instance, approximately 1/3 of counselors indicate that they do not understand opportunities for students after high school or have the knowledge and preparation to help students plan for their future career. Similarly, approximately 1/3 of counselors are unaware of the skills training students receive in CTE programs of study or MCPS activities to build partnerships with businesses to offer real-world work experiences.

Business and Industry Want to Assist MCPS

Although the sample was limited, employers overwhelmingly indicated their interest and willingness to (1) be further engaged in processes to identify specific skills for programs of study and (2) offer work-based learning opportunities to students. Overall, they are interested in gaining a single point of contact for this engagement and would like further clarification about legal restrictions regarding work-based learning.

Focus Groups

Beyond analysis of performance data and surveys, ESG qualitatively measured the knowledge, awareness, and perceptions of MCPS's career readiness work with key stakeholders. In total, ESG led nine separate focus groups to delve more deeply into the ideas uncovered by the data analysis. Those focus groups included:

- Watkins Mill High School Parents
- Wheaton High School Parents
- Bethesda-Chevy Chase High School Parents, Students, and Faculty
- Gaithersburg High School Parents, Students, and Faculty
- Business and Industry Leaders of Montgomery County

In addition, MCPS used ESG' protocols (provided in Appendix C) to conduct student focus groups at Watkins Mill High School, Wheaton High School, and the Edison School of Technology to gather additional feedback on career preparation efforts, bringing the total number of focus groups to 12. Moreover, ESG also conducted one-on-one phone interviews with a number of postsecondary education leaders at both Montgomery College and the Universities at Shady Grove as well as with leaders from the employer and economic development communities to better understand work currently underway and potential opportunities for broader stakeholder engagement. Findings from those conversations are embedded in the following section.

Cumulative Findings from ESG's Career Readiness Review

Taken together, the different components of the career readiness external review – the performance data analysis, multi-district benchmarking, stakeholder surveys, focus groups, and individual interviews – offer insight into the various career preparation efforts already underway in MCPS. They provide a clearer picture of what's working well and where there is need and opportunity for improvement. Those findings are organized below into five focus areas to allow for the integration and prioritization of key themes and ideas: Vision and Systemic Priorities for Career Readiness, Employer Engagement, Quality and Rigor of CTE, the Edison School of Technology, and Stakeholder Understanding.

While there are many strengths to boast about within MCPS's system, ESG was especially tasked in this project with determining areas in need of improvement. Accordingly, the findings below intentionally focus on identifying gaps and making recommendations for closing them.

Focus Area 1: Vision and Systemic Priorities for Career Readiness

There is a clear and commendable culture of high expectations for all students in MCPS. With few exceptions, district- and school-based administrators are committed to meaningful student outcomes, and most of the educators and administrators reflect a belief that all kids can achieve at high levels if encouraged and supported. MCPS must leverage this culture as it considers how to make career readiness a more meaningful part of its strategy to prepare all students for postsecondary success.

There is a clear and commendable culture of high expectations for all students in MCPS. The district must leverage this culture as it considers how to make career readiness a more meaningful part of its strategy to prepare all students for postsecondary success.

The challenge, however, is that high expectations in MCPS have been translated to mean four-year college-readiness almost exclusively; career readiness has been marginalized as a priority, sometimes being inaccurately perceived as the antithesis of the college-going culture. This lack of an integrated vision of success that promotes both college and career readiness was revealed in several different ways throughout the project.

Narrow Focus Impacts Career Preparation Efforts

While a nearly exclusive focus on the goal of 4-year college for all students is a natural extension of MCPS's culture of high expectations, it unintentionally contributes to a lack of vision and strategy district-wide for career readiness. It overlooks the significant number of high-quality, professional career opportunities of today and tomorrow for students who earn stackable industry-recognized credentials,

certificates awarded by postsecondary institutions, or two-year college degrees. It also undervalues students who complete an apprenticeship or enter the military. At present, according to WorkSource Montgomery, there are more than 2,000 jobs posted in Montgomery County, and approximately two-thirds of them are middle skill that require more than a high school diploma but less than a bachelor's degree.

Undervalued College & Career-Ready Opportunities

Because of this narrow vision of success, and because students, teachers, counselors, administrators, and parents generally lack needed knowledge of the job market and opportunities available to students with technical skills, there is little appreciation for completing both a traditional graduation pathway and a CTE program of stud. Stakeholders often lack the understanding of how the combination of the two could powerfully prepare and propel students toward career and economic success.

Lack of Experience with 21st Century CTE

While educators in MCPS – teachers, counselors, and administrators - demonstrate a deep grasp of the college prep pathway, in many cases they lack an experience base with high-quality 21st century CTE that includes rigorous academic and technical instruction in high-skill, high-demand industry sectors delivered at the secondary and postsecondary levels; structured work-based learning experiences that develop and assess technical and professional skills; and opportunities to earn industry-recognized credentials and/or articulated credit towards a postsecondary degree. This experience deficit contributes to a rudimentary understanding of how "vocational education" has been transformed over time in response to changes in our economy into more sophisticated, advanced learning experiences that often times incorporate college credit or other postsecondary education linkages.

Cumbersome Focus on Requirements

MCPS staff and students are exceptionally well versed in and focused on meeting graduation requirements as a necessary part of their educational experience. While that is essential to ensuring that students stay on a successful path, the relentless focus on checking off those boxes seems to curtail their ability to think more creatively about high school course-taking opportunities, and CTE programs of study are often on the losing end of those decisions. Lack of understanding about how students can meaningfully blend CTE and advance courses in their schedules contributes to this mentality.

Lack of understanding about how students can meaningfully blend CTE and advance courses in their schedules pervades.

Career Readiness Absent from Accountability Metrics

System drivers have been and continue to be raising the high school graduation and four-year college-going rates. That intense focus has been key to MCPS's success, earning it a consistent ranking as one of the most successful school systems in the country. The opportunity cost of that narrow agenda however is that career readiness, despite clear efforts by CTE staff, is scantly present as a priority. That is

confirmed by its noticeable absence from metrics by which the district holds itself accountable. While MCPS is very clear and intentional about what it is trying to accomplish in terms of SAT scores and AP/IB participation and success rates, it lacks any similar focus on complementary achievements such as completion of high-quality work-based learning experiences and attainment of stackable industry-recognized credentials with labor market value, for example.

Lack of Organizational Structure around CTE

This absence from accountability metrics is confounded by where CTE sits in the district office. Previous efforts to integrate CTE within core academic areas by dissolving it as a single division seem to have instead produced an unintended effect: It is a division without a clear home, with CTE Supervisors reporting to two separate central office directors, which can cause it to be perceived as a low priority without a clear direction. By any barometer, career readiness does not seem to be central to the mission of the school system; it is considered by many stakeholders as the "lesser-than" option for some kids, rather than a rigorous, high-quality option for all kids as part of a robust college-ready strategy. And, importantly, MCPS is missing opportunities to blend CTE into the broader college-preparatory strategy so that the two are seen as mutually reinforcing rather than competing.

Focus Area 2: Employer Engagement/Demand-Driven Programming

Within the MCPS central office staff, there is an awareness of and commitment to the importance of aligning career preparation efforts with labor market demand to prepare students for the high-paying, in-demand jobs of today and tomorrow. MCPS clearly recognizes the need to meaningfully engage key employers to ensure alignment between its programs and the changing needs of the labor market. There is a plethora of business and industry within Montgomery County and the surrounding DC region that are part of a vibrant, growing economy in which MCPS students will eventually search for employment. Despite these seemingly strong conditions for employer engagement, there remain substantial gaps in MCPS's current work.

Career Program Misalignment with Economic Development Needs

While MCPS is committed to demand-driven career programming, it does not appear to have a systematic process in place to facilitate the alignment of programs of study with the long-term economic development needs of the county. There is no macro plan and strategy to partner with the county's economic development experts and industry leaders to analyze labor market projections across the region and identify the high priority career programs of study that need to be expanded to meet those needs. This is one of the most strategic ways school systems can engage employers,

There is no macro plan and strategy to partner with the county's economic development experts and industry leaders to analyze labor market projections across the region and identify the high priority career programs of study that need to be expanded.

and it is essential to maintaining a high quality, responsive career preparation program.

Lack of a Comprehensive Intermediary Organization

Although there are a number of entities that work with employers, Montgomery County lacks a comprehensive intermediary organization that effectively connects MCPS with the business community and labor market. The Montgomery County Collaboration Board (MCCB), WorkSource Montgomery, the Montgomery County Business Roundtable for Education (MCBRE), and the three Industry Foundations each serve different purposes, play different roles, and have developed different functionalities. The combination of players creates confusion among employers regarding how best to engage the school system; rather than having a seat at *the* table, there are multiple entities and multiple tables that lead to disjointed solutions.

Employer Role Not Optimized

Beyond the shortcomings associated with having multiple intermediary organizations, there appear to be two consistent challenges within the work MCPS has taken on with employers:

- Employers who are engaged by MCPS suggest that they are offered the chance to participate but not lead in a way that drives programmatic and policy direction to better prepare students for high-skill, high-demand industries. They are invited to meetings where information is shared to make them knowledgeable about the work rather than leveraging their sector-based experience to help determine career programming needs.
- While many *sectors* are represented across the different intermediary organizations, not all of the right *employers* are included, and there is significant variance across the organizations in terms of the level of company executive who is engaged by MCPS.

Montgomery County Collaboration Board (MCCB) Challenges

As the organization most consistently relied upon to leverage employer voice and identify the programs of study that should be prioritized and scaled within MCPS according to industry needs, the MCCB faces two primary challenges:

- The MCCB and its PACs must consistently and more effectively focus on using labor market data to identify and prioritize career programs and align industry expectations with curriculum, instruction, and assessment. Systematically reviewing student or program outcomes as part of a feedback loop to ensure continuous improvement of career programs does not seem to be part of their current regular practice. Coordination is lacking across the broader MCCB with most of the work being done at the PAC level, which reserves MCCB meetings primarily for information sharing that is frequently disconnected from MCPS policy-making.
- MCCB does not appear to be representative of both large and small employers in the county. In some instances, PAC membership is not comprised of enough employers; in fact, membership lists sometimes have significantly more educators on them than employers.

Employers Underutilized in Preparing Students for Careers

Staff within MCPS recognize the value and importance of providing career awareness and exploration opportunities to students to help them understand the connection between classroom learning and the world of work. This is evidenced by the relatively strong system-wide emphasis on internship opportunities for high school students. However, employers seem to be largely absent from the role of explaining what real jobs look like and consist of today, and they are not offering work-based learning opportunities at any meaningful scale to provide real-world, hands-on experiences to students. MCPS is not alone in this challenge; most states and districts are struggling to scale high quality work-based learning opportunities. But there is an increased appreciation for its value and greater attention is being paid to it around the country.

Employers undervalue K-12

Employers often overlook the value high school students bring to industry skill needs, generally perceiving the college and/or adult education pipeline as their opportunity to plug skill gaps. Instead, employers often seem to view working with MCPS as a charitable or philanthropic contribution rather than seeing the value proposition of high school students as at least a partial solution to their talent acquisition needs. While it is true that higher education campuses may provide more fertile recruiting ground for hiring efforts, MCPS is still well positioned to engage with the employer community to better understand the skill gaps they face today and the projected opportunities they will have within their workforce in the longer term so that programs of study that start in K-12 and articulate into postsecondary education can be directly responsive to those needs. Given that so many youth will work while enrolled in postsecondary education, there is a significant opportunity for early engagement paying dividends for both students and employers.

Lack of Clear Access Point within MCPS for Employers

MCPS employs a general strategic partnership coordinator to cultivate all external relationships, but there is not a single, specialized point of access for employers within MCPS for fielding inquiries and developing relationships/business partnerships. Employers within the business and industry focus group lamented, “Make it easy for us to help.” MCPS is often regarded as being inaccessible to employers who want to lean in and help, especially when those employers lack the time and/or understanding of the school system to make multiple engagement attempts.

Focus Area 3: Quality and Rigor of Career-Technology Education (CTE) in MCPS

Information gleaned from focus groups, phone interviews, and policy reviews make clear that MCPS has the basic building blocks to make a high-quality, district-wide career preparation delivery system part of its broader strategy and programs. It has anchored its programs of study in industry-recognized credentials (IRCs); acquired a technical career advisement system; placed internship coordinators in every high school; imported and/or grown respected program of study models in a number of schools (e.g. National Academies Foundation (NAF), Project Lead the Way (PLTW), Middle College, Cisco); and

taken steps to publicize CTE opportunities. CTE staff are knowledgeable and committed to their work; teachers and principals readily acknowledge the need for more robust career preparation efforts; and there is generally a shared belief that career preparation must be delivered with high quality within an overall system that prepares students for postsecondary education and training.

While these building blocks exist within MCPS, they have not yet been assembled to create a complete, coherent system of career preparation. Particular challenges include:

Lack of Systematic Approach

MCPS lacks a systematic, strategic, structured approach by which to identify demand-driven programs of study and distribute them across schools. Programs of study are currently offered unevenly across the district with a smorgasbord popping up within schools seemingly without clear intentionality. Two areas in particular warrant deeper thought and planning:

Programs of study are currently offered unevenly across the district.

- **Establishing and using specific criteria to determine which programs of study should be scaled up and which should be phased out**: In high-performing states and districts, those decisions are made based on a careful analysis of labor market projections so that pathways that lead to opportunities in high-skill, high-demand sectors are expanded, and those tied to lower-skill, lower-demand sectors are phased out. This goes hand-in-hand with the ideas described previously in the employer engagement section.
- **Developing and executing a clear strategy to determine which programs should be offered in each MCPS high school**: It appears that decisions regarding program of study offerings throughout MCPS are often left to school principals' discretion rather than responding to a clear systemwide plan that ensures programs and pathways with strong labor market linkages are available to all students. Furthermore, too much authority seems to have been ceded to the schools to select courses for inclusion within those program of study offerings. This underestimates the knowledge and skill it takes to create the logical, sequential programs of study that CTE requires to be high-quality and leads to multiple programs of study with the same name but different requirements and expectations of students.

Few Concentrators and Completers

While over half of MCPS students enroll in an introductory program of study course, only 18% achieve concentrator status, and only 10% complete a program of study, which is significantly lower than other similar districts within Maryland. This consistent trend appears to be indicative of the perceived lack of value POS offer to students who often take an introductory course to "dip their toe in the water" and/or fulfill the technology education requirement. Completing a program of study as currently offered by MCPS has limited currency among high school students and their parents.

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Fierce Competition for Enrollees

At a school level, CTE competes for enrollees against other elective courses and advanced academic course offerings, which is another reason for its declining enrollment. Students (and teachers, parents, counselors for that matter) don't understand how or why they can "have it all". While it is technically possible to take both honors/AP/IB courses and complete a program of study, there seems to be a common school of thought that it is neither possible nor desirable, especially since students are selective about electives given the precious little room in their schedules outside of fulfilling all the graduation requirements. Further, there seems to be very little recognition that dual enrollment opportunities within programs of study can help navigate this challenge.

Uneven Work-Based Learning Opportunities

While internships are offered in the senior year at all high schools, only one-in-five seniors on average participate, and some of the experiences that count toward that figure don't meet the bar of high expectations.

MCPS rightly believes that offering rigorous and relevant workplace experiences connected to students' academic and career interests is an effective strategy for preparing all students for postsecondary life. While internships are offered in the senior year at all high schools, only one-in-five seniors on average participate, and some of the experiences that count toward that figure don't meet the bar of high expectations. The program as a whole appears to be somewhat random, relying heavily on the school-level coordinators placed within every high school to find and/or design internships for seniors, which results in unequal quality and distribution of opportunity for students. An experience at a worksite in a priority industry counts the same as an "internship" within an MCPS high school. There is no central organizing mechanism within the district office that sets high standards for workplace experiences or brokers internships for multiple schools through priority employers. Internships also seem to be disconnected from course-taking, and it's often up to the students to find an opportunity in an area of academic/career interest. Because internships count as an elective credit rather than as an integral component of a program of study for academic credit, students are discouraged from seeking out an internship unless and until they've met their graduation requirements. Moreover, it would be difficult to transition internships to academic credit at this point given that the assessment of such experiences is focused only on low level soft skills. MCPS has not set metrics for participation and outcomes that are tied to its overall goals.

Underutilized Online Career Advisement System

MCPS has correctly recognized the need to provide focused career advisement to students, beginning with raising career awareness among middle school students, then shifting into career exploration and preparation for high school students. Given the complexity of that work and the inherent difficulty of adding responsibility for it to counselors who already carry significant workloads, MCPS has recognized the need to put in place a software system – Naviance - as a strong first step toward a solution. However, while Naviance software offers tools for both postsecondary planning and career assessment,

MCPS students readily admit that the college planner is being used rather exclusively at this time with the career planner being largely overlooked (though it is part of the license fee MCPS has paid). The career planner – known as the Career Key Assessment Tool - has within the last two years been used to help middle school students generally identify where they excel and what they're interested in doing for a career. MCPS has not yet taken the next step of developing a blended solution – that is leveraging the software capability of Naviance and supporting it with personal expertise to help students determine which high school courses and programs of study are best aligned with their postsecondary academic and career interests and create a plan to get there.

Incomplete Relationship with Postsecondary Partners

In high functioning systems across the country, programs of study include dual enrollment/credit opportunities to maintain rigor and relevance and give students high-quality postsecondary instruction while they're in high school. That is underutilized in MCPS. There is not yet a shared vision between MCPS and its postsecondary partners for a career preparation delivery system that includes dual enrollment/credit and is tightly aligned with the current and projected needs of the region's labor market in high-skill, high-demand fields. Nor is there shared accountability for results between MCPS and its postsecondary partners for the work they do together; outcome data is not disaggregated and analyzed to determine the effectiveness of the partnership. Students are not receiving transcripted credit for successful completion of postsecondary coursework, and the fees that are passed on to students are, in some cases, a barrier to dual enrollment.

Focus Area 4: Edison School of Technology

During the course of the project, ESG conducted a site visit of the Edison School of Technology ("Edison") and led a group interview of its faculty in addition to reviewing its performance data and program of study offerings. Edison differentiates itself from other MCPS high schools in a number of ways, chief among them its relentless focus on preparing students for specific career opportunities beyond high school. Staff at Edison are notably dedicated to their work, and students are clear about the career field they're working towards and the qualifications they have to meet to obtain a job in that field. While Edison's focus is primarily on developing students' skills for near-term employment, staff readily acknowledge and support the notion that there are multiple paths to career success, and many of their students can, should, and do graduate from Edison and enroll in a formal postsecondary education program, either immediately after graduation or after working in the "real world" for a short time. The industry-recognized credential they strive to earn at Edison is key to the latter scenario, enabling them to find a job that pays a good wage so that they can save money and/or help their families before/while enrolling in college or a training program on a part-time or full-time basis.

However, Edison remains significantly under-enrolled, and that has been the case for a number of years running. Characteristics and conditions that contribute to its value proposition among stakeholders include:

Largely Unknown

Edison is relatively unknown by most stakeholders with 54% of students and 50% of parents expressing some lack of awareness of the CTE programs offered at Edison. They have a general idea that it provides training in skilled trades, and it is a part-time option. This, along with other challenges described below, is likely in-part responsible for the challenges Edison has consistently encountered over the recent past with enrollment. With a population far below the number of students it is intended to serve in its current facility, Edison struggles to attract students, resulting in under-enrolled programs of study and an under-utilized facility.

Lesser-than Opportunity

Focus group participants – students, staff, parents - expressed that Edison is generally regarded as a "lesser-than" opportunity primarily for students who do not plan to go to college. They assume it lacks rigor and offers lower-level vocational education classes. While their rather harsh perception is inflated, it is substantiated in part by more objective data points. Though Edison offers programs of study exclusively (academic and other elective courses are not available there), only 50% of its students actually complete their required course sequences. Of those, about two-thirds earn industry-recognized credentials, and fewer than 10% of its total seniors participated in an internship last year. And though it intentionally prepares students for near-term middle skill employment that very frequently requires some level of postsecondary education and training, less than 2% of its students dually enroll in a college-level course or participate in college-level instruction of any kind.

With a population far below the number of students it is intended to serve in its current facility, Edison struggles to attract students, resulting in under-enrolled programs of study and an under-utilized facility.

Problematic Model

While location and travel time are often initially cited as deterrents to enrollment by students and parents, upon deeper questioning and analysis it becomes clear that their more substantial concerns are with the model itself. Specifically, students and their parents are largely unwilling to lose a class period each day to travel to a school that offers only a partial high school experience. Students at Edison cannot take academic courses much less honors classes; they lose their feeling of belonging to a permanent/full-time school community; they find it difficult to form relationships with peers who will each return to their respective home school campuses every afternoon; and they seem to question the quality of the programs that are available.

Unclear Vision and Lack of Inclusion

There doesn't seem to be a clear or common vision for how Edison fits into the broader MCPS college- and career-ready strategy today, and there is similar vagueness about how the new Edison currently under construction will be different. This rather abstract perspective of how Edison fits into the district's overall strategy of preparing students for college makes better sense when placed in the context of how

Edison is managed and supported, with as many as five district administrators from two different central office divisions jointly supervising the school in some way. Edison vacillates between being considered a program and a school, and yet it has as its only accountability measure the extent to which its students earn industry-recognized credentials. It does not share in the responsibility for raising PARCC, SAT, or AP scores for example, nor do its teachers or administrators even have access to their students' academic records. This nearly renders it as a partial member of the MCPS system whose position and value has not yet been fully formed. While some expressed the belief that a new facility will attract students and solve the enrollment problems, these larger challenges need to be addressed.

Focus Area #5: Stakeholder Understanding

MCPS parents, students, faculty, and staff are exceptionally thoughtful about preparing all kids for success in college. They have knowledge and understanding of the value a four-year degree brings to students transitioning from dependent to independent living, and they are generally aware of the range of college opportunities and associated admission requirements of higher education institutions within and beyond Montgomery County borders.

Yet there is a very discernible lack of understanding of career readiness and its goals on the part of nearly all MCPS stakeholders. This came across through surveys, focus groups, and individual interviews and can best be described in three ways:

Information Gap on New Economic Opportunities

Among students, parents, teachers, counselors, and administrators, there appears to be a low level of awareness of the labor market shifts that have reshaped the American economy over the last decade, and in particular, about the range of existing middle skill career options that offer well-paying, stable professional career opportunities. These middle skill career opportunities require more than a high school diploma but less than a bachelor's degree. At the same time, parents and staff in particular sometimes lamented the intensity of pushing students toward a four-year college experience questioning whether it is in fact the only route to economic and career success.

Lack of Knowledge about the Value of CTE

There is a widespread lack of knowledge and understanding among students, parents, teachers, counselors, and administrators regarding the value of high-quality CTE as part of an effective strategy to prepare students for college and the workplace. A number of stakeholders continue to rely on prior experience with traditional vocational education to inform their current thinking. While CTE leaders in MCPS have worked hard to share specific programmatic information – via the MCPS website and special events like CTE "road shows", Career Readiness Night, and College and Career Expo – their efforts have not fully

There is a widespread lack of knowledge and understanding among students, parents, teachers, counselors, and administrators regarding the value of high-quality CTE as part of an effective strategy to prepare students for college and the workplace.

saturated the district, perhaps because the information they've shared is presently a grain size too small. Stakeholders first want and need more general information about the power of CTE for students and the economy, and they want it during middle school while they have time to rethink their planned high school course schedules. This in turn might then persuade students and parents to look more seriously into particular CTE offerings. Absent that sequence of events, they will be hard-pressed to change their opinions of CTE.

Lack of Understanding of CTE

This becomes a more understandable position when one realizes that MCPS stakeholders for the most part do not actually understand what CTE is, and many do not associate high-quality programs of study like PLTW, NAF, and Code.org as CTE offerings. In fact, of survey respondents, 41% of students, 48% of parents, and 34% of teachers/administrators/counselors indicated that they "don't know" if CTE in MCPS offers challenging, rigorous programs of study for students that develop the academic knowledge and technical skill needed for college and career. And 79% of students and 86% of parents agree/strongly agree that they need more information on the various career preparation opportunities that are available throughout MCPS. There is clear interest on the part of parents and students, and even faculty and staff, for more information on career opportunities generally and how the programs of study connect to them and to college.

ESG Recommendations for MCPS

Taking into consideration each of the findings above, ESG offers for the MCPS Superintendent and Board of Education's consideration the following set of strategic action steps parsed into the five focus areas.

Focus Area #1: Vision and Systemic Priorities for Career Readiness

MCPS must begin by taking specific steps to establish career readiness as a priority for the district in pursuit of its goal to ensure that every student graduates with the knowledge and skills to be ready for both college and "good jobs". Key to executing well will be leveraging its already robust culture of high expectations for every student as it launches the four strategies that follow.

Establish a New Vision

MCPS must establish a new vision for career readiness, one that is for *all* students and that includes clear metrics for success and shared accountability for outcomes with employers and postsecondary education leaders with whom MCPS must be joined arm in arm to do this work well. It should complement and be married with, rather than compete with, the college-ready goals of MCPS. The culture of high expectations is strong; the vision and narrative needs to evolve to incorporate career preparation.

*MCPS must establish a new vision for career readiness, one that is for **all** students and that includes clear metrics for success and shared accountability for outcomes with employers and postsecondary education leaders with whom MCPS must be joined arm in arm to do this work well.*

Redefine and Rebrand CTE

MCPS must carefully lay out the role of high-quality CTE within this vision, which includes redefining and rebranding CTE as offering rigorous academic coursework integrated with 21st century technical instruction and real-world work experiences. High-quality programs of study must be situated not as an alternative to the 4-year college pathway but rather as a specific strategy to support MCPS's broader goals around preparing all students for postsecondary opportunities and options. MCPS might consider changing the terminology so that CTE isn't the label used to describe career-focused programs; as is, it is not a well-understood brand in MCPS, and the connotation it seems to carry is not strong. In California for example, they branded their strategy "Linked Learning" to reflect the collaboration it takes between K-12, postsecondary education, business and industry, and economic development to prepare students for the 21st century world of work. In Louisiana, they've coined their efforts "Jump Start," a literal representation of helping students get a jump start on continuing their education beyond high school while earning valuable industry certifications in high school. If MCPS were to refer to all high school

programs of study using a new label that suggests preparation for the future, that might help create a new, shared vision for career preparation.

Provide Professional Development on the Economy

Given the lack of knowledge and understanding of labor market shifts that have impacted future career opportunities for young people, MCPS must educate counselors, teachers, and administrators on the long-term economic development needs of the county and surrounding region as well as the associated programmatic offerings of MCPS today. It must identify the related degree/credential requirements and associated salaries so that they have compelling information to facilitate the necessary mindset shift. Montgomery County economic development partners can be instrumental in helping to design this professional development, and all staff members should participate in it, especially at the secondary level.

Establish Metrics for Career Readiness Success

Increase MCPS's "skin in the game" by building into accountability metrics, perhaps through School Improvement Plans, goals around indicators of high-quality career preparation efforts. Such goals might include program of study concentration and completion rates, work-based learning and dual enrollment/credit participation, and attainment of high-value industry-recognized credentials. Publicly report and monitor those rates. For example, Ohio created a CTE school report card that reports pathway completion and preparation for successful transitions beyond high school, including measures like dual enrollment for CTE students. Delaware has created a dashboard of Perkins and state accountability measures that enables school, district, and state officials to drill into performance at the program level. The state convenes school and district personnel monthly to discuss performance issues and highlight successful programs.

Focus Area #2: Employer Engagement/Demand-Driven Programming

As MCPS sets in place a new vision for its career preparation efforts aligned with the region's economic development needs in high-skill, high-demand sectors, it must simultaneously energize the employer community to become strong partners in realizing that vision. Clear and substantial roles need to be cultivated for business and industry leaders to help align programs of study with labor market needs in ways that are described in more detail below.

Clear and substantial roles need to be cultivated for business and industry leaders to help align programs of study with labor market needs.

Put Industry Executives in the Role of Programmatic Drivers

While there are several established employer intermediaries already working with MCPS, none is comprehensively serving the two key roles that are needed: 1) using labor market information to identify the career preparation efforts that should be prioritized and scaled within MCPS to meet the

long-term, high-skill, high-demand industry workforce needs; and 2) provide input on the career readiness metrics by which MCPS should hold itself accountable, including monitoring and tracking those results to inform necessary changes to career preparation efforts.

To fill this void, MCPS should establish a policy-level ***Superintendent's Career Readiness Advisory Council*** comprised of high-level executives of the county's key industries. Ideally, these executives should be drawn from the existing intermediary boards – MCBRE, WorkSource Montgomery, MCCB, and the Industry Foundations – in cases where those boards have the right industry leaders represented. Then, grant the Advisory Council regular, direct access to the Superintendent of MCPS to meaningfully influence the district's career preparation work as described above. Their work would not replace, but rather help set the direction for the work of current intermediary organizations.

Redefine MCCB's Role

Then, restructure the role/function of the current Montgomery County Collaboration Board (MCCB) to meet and build upon the recommendations of the Superintendent's Advisory Council. MCPS must collaborate with its MCCB employer partners as well as Montgomery College (MC) and the Universities at Shady Grove (USG) to work together in aligning industry expectations with program curriculum, instruction, and assessment. Employers must identify needed skill sets within prioritized programs of study and work with MCPS, MC, and USG to shape the design of those programs of study to ensure that they will develop the necessary knowledge and technical skills. MCCB must systematically review outcomes related to key indicators established by the Advisory Council – program of study concentrators and completers, work-based learning and dual enrollment participation rates, and attainment of high-value industry certifications – as part of a feedback loop, and make specific recommendations on strategies to strengthen MCPS's career preparation programs. This includes empowering the MCCB employers to use labor market data on high-skill, high-demand fields to justify continuation of programs on a regular basis to enable the Advisory Council to approve new and continued programs as well as discontinue those that lack rigor and relevance.

Establish a Single Point of Contact for Employers

To strengthen and streamline the district's work with business and industry, and to respond to concerns among employers that there's no clear place to go to build partnerships, MCPS should create a single point of contact. The function should not simply be incorporated into the current partnership coordinator's responsibilities. The role is too important, and it requires a specific expertise and experience that allows for meaningful employer engagement. This senior-level "Director of Strategic Industry Partnerships" should ideally have experience in both education and the corporate world and should be dedicated to two priorities:

1. Serving as the manager of the Superintendent's Advisory Council responsible for overall planning and execution of the work.
2. Brokering, professionalizing, and scaling a full portfolio of work-based learning experiences for high school students with support from MCBRE and WorkSource Montgomery. This would also include supporting and overseeing the school-level internship coordinators.

Focus Area #3: Quality and Consistency of Career Programming

Once the new vision has been established, MCPS must put into motion specific strategies to strengthen the quality and consistency of its career programming ensuring that programs of study are rigorous, aligned with college-ready standards, and not terminal in high schools but rather provide significant postsecondary education opportunities that lead to good jobs in high-skill, high-demand industries. The following recommendations further break down how MCPS should approach this.

Design and Execute a Systematic Approach to Delivery of Career Programming

Derived directly from the new vision for career readiness, MCPS must design and execute a systematic approach to the delivery of career readiness programming throughout the district. This strategic approach would directly address the lack of consistency currently within career program offerings across high schools, and it would leverage the work of the Superintendent's Advisory Council to ensure those offerings are well-aligned with economic opportunities. It would have two primary objectives: a) ensuring that every student in MCPS has access to a full range of high-skill, high-demand programs of study - whether that's imported like PLTW and NAF or homegrown - aligned with the emerging and longer-term economic development needs of the county in high-skill, high-demand fields; and b) each of those programs of study would consistently offer rigorous, integrated academic and technical instruction brought to life by real-world learning experiences that prepare all students for postsecondary success.

Establish Choice Enrollment for Programs of Study

Clearly, MCPS cannot offer each of these high-skill, high-demand programs of study in every high school, so strategic placement of them throughout the district as well choice enrollment opportunities will be key to executing this equitable distribution agenda effectively. Students who have demonstrated and documented an academic and career interest in a particular program of study (e.g. Cisco IT) but do not have access to it in their home school should be offered a Change of School Assignment (COSA) opportunity to enroll full-time at the closest high school to offer it on the condition that they complete that program of study and earn the associated industry-recognized credential.

Strengthen the Quality of Programs of Study

It goes without saying that it would be pointless to equitably distribute career programming, including CTE programs of study, throughout MCPS unless they are high quality. There are several key steps MCPS should take in its career readiness work to ensure that all programming is rigorous and relevant and prepares all students effectively for the high-quality postsecondary education and training opportunity of their choice:

Inventory and Assess Current Programs of Study

Agree to a set of high-quality indicators for all career programs of study. Those indicators should ideally include degree of alignment to long-term, high-value regional economic opportunities, ability to earn honors and college credit, participation in and assessment of a relevant worksite internship, and attainment of high-value industry-recognized credentials. In addition, all program of study offerings

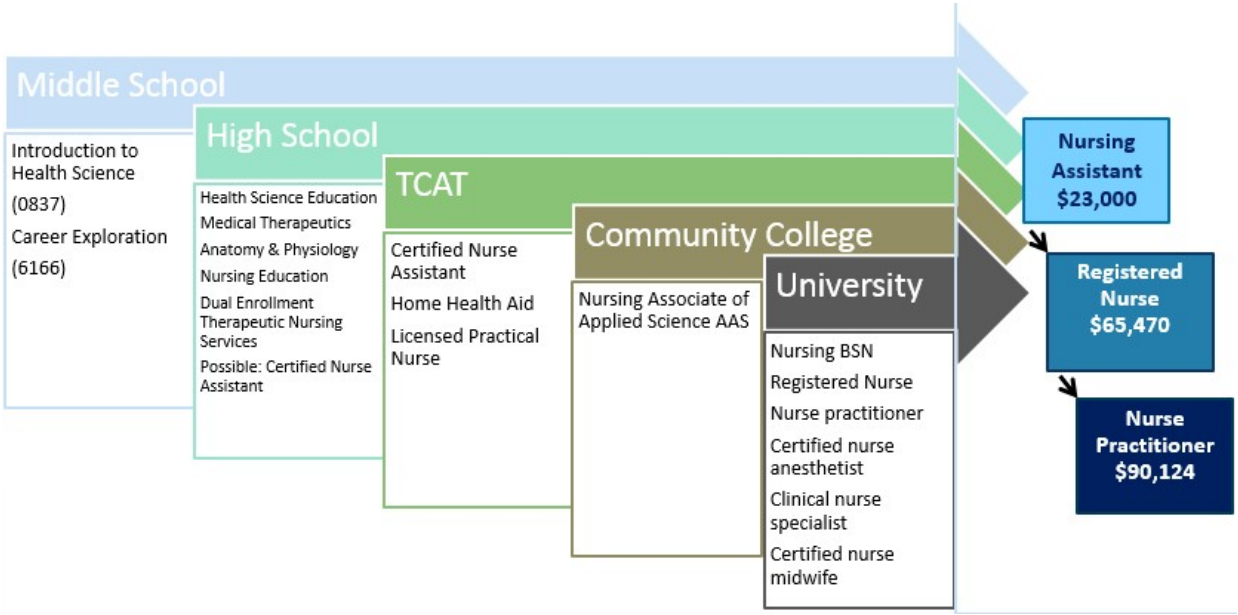
should be analyzed across schools to ensure consistency, e.g. the Academy of Health Professions program of study must be the same across all schools that offer it. Then assess current programs of study against those indicators, and either upgrade or retire those that lead to low-wage positions or otherwise fall short of the high expectations bar in light of economic opportunities of today and tomorrow. The Maryland State Department of Education's Division of Career and College Readiness could support this work, and Tennessee's Pathways Site Observation Tool may be a helpful resource to begin this assessment.

Ensure Postsecondary Articulation

Require all programs of study include an accessible postsecondary education component and lead to high-skill, high-demand careers. This demands that MCPS work hand-in-hand with its postsecondary education partners to create a shared vision of a career preparation delivery system that begins in high school, continues into college, culminates in stackable credentials, and includes common metrics for accountability. (See the graphic representing this concept below from the state of Tennessee.) The goal should be for MCPS students to earn articulated postsecondary credit for CTE dual enrollment courses and high-quality work-based learning experiences, especially within programs of study that begin in high school and culminate in a higher education institution.

MCPS must work hand-in-hand with its postsecondary education partners to create a shared vision of a career preparation delivery system that begins in high school, continues into college, culminates in stackable credentials, and includes common metrics for accountability.

Moreover, MCPS should work closely with its postsecondary partners like Montgomery College to establish policy that would allow high-value industry-recognized certifications earned in high school to count for transferrable college credit. Tennessee accomplished this by establishing an MOU with their technical college system to award college credit for a state-approved industry-recognized credential. Also, in Florida, the state's annual credential list classifies industry-recognized certifications into tiers based on how many credits they are worth at the postsecondary level. The lower tier of credentials, known as CAPE Digital Tool Certificates, do not articulate credits, but the higher tier CAPE Industry Certifications and CAPE Acceleration Industry Certifications articulate up to 14 and 15 credits respectively toward an Associate of Science or Applied Associate of Science Degree.



(Graphic taken from Tennessee's Student Certification Guidance, July 2016)

Add Rigor to Academic Coursework within Programs of Study

While 16 of the current programs of study in MCPS offer some advanced coursework opportunities, many others do not. Furthermore, within the 16, there is some reasonable question regarding the degree to which each of those advanced courses is consistently offered within those programs of study across schools. MCPS must strengthen the academic rigor of programs of study, in part by expanding proven imported models like PLTW, NAF, and Cisco and successful homegrown programs like Middle College. Programs of study must consistently integrate honors, AP/IB, dual enrollment, and technical course-taking as part of a college prep strategy. MCPS must work with counselors, teachers (both core areas and CTE), and school administrators to help them understand these integrated programs of study so that it becomes clear to them that programs of study hold high expectations of all students and that these integrated pieces fit together within the priorities staff are expected to meet around preparing students for college. Staff will also need support regarding how to schedule students into the courses.

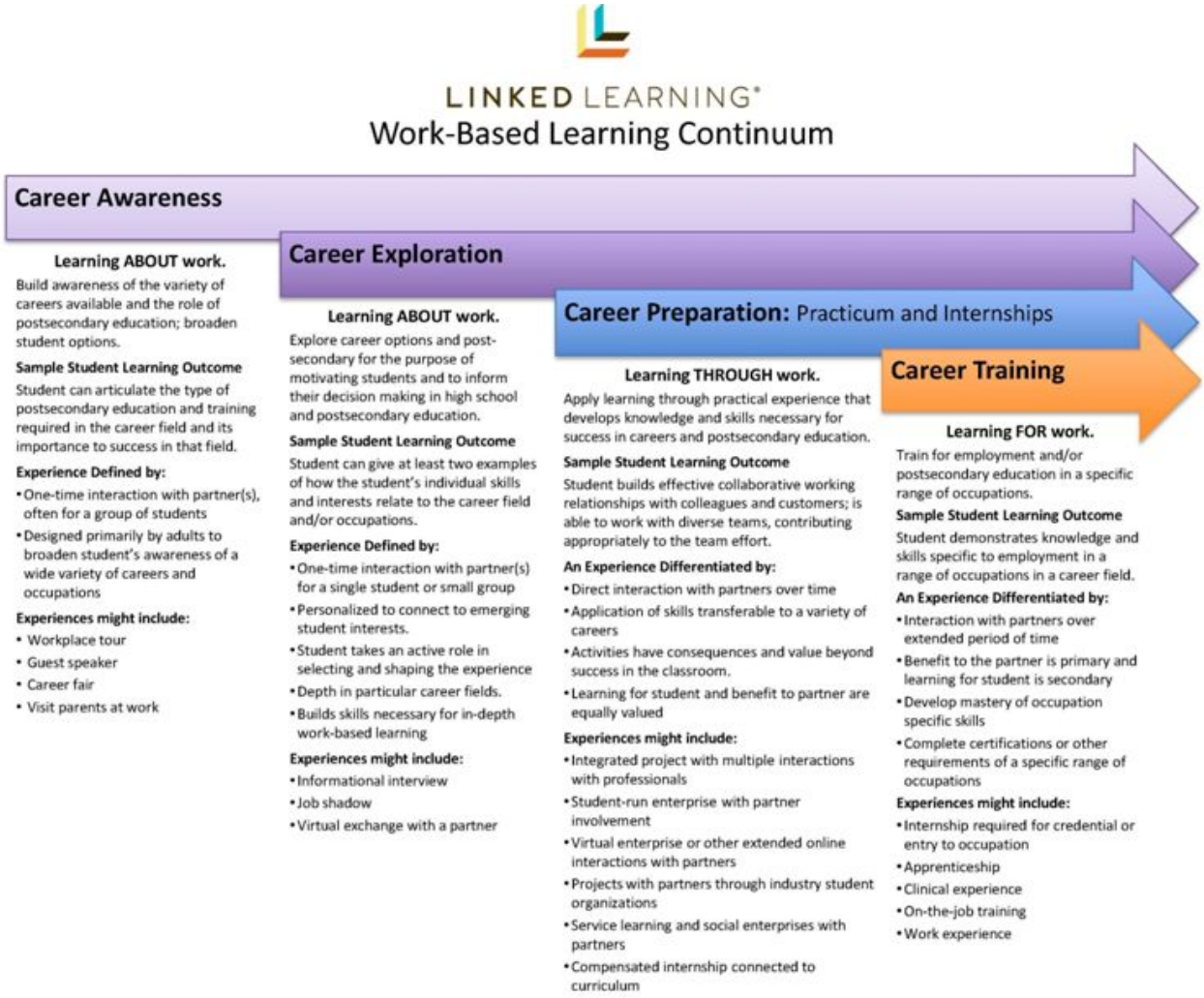
Design and Offer Work-Based Learning at Scale

MCPS must design and offer better and more real-world work experiences that are aligned with students' academic and career interests.

Leveraging its newly-appointed MCPS Director of Strategic Industry Partnerships as well as MCBRE and WorkSource Montgomery, MCPS must design and offer better and more real-world work experiences that are aligned with students' academic and career interests. These experiences must be an integral part of each program of study and also be made available more broadly to all students. They must offer students the chance to develop technical and professional skills in their chosen field of study, and they must be meaningfully assessed by employers to determine the extent to which those skills were acquired. In addition, some form of work-based learning – such as job shadowing and career challenges - should be made available in middle school and early in high

school so that students have the necessary experience to better understand careers and think more critically about the courses they want to take while in high school.

Linked Learning requires high-quality work-based learning experiences as part of a program of study and may be a model for MCPS to study (as shown below) as it develops its scaling strategy. In addition, Linked Learning's technology platform known as Launch Path that matches students with work-based learning experiences in an area of academic or career interest may be a helpful tool for MCPS to explore.



Expand and Strengthen the Career Advisement System

A comprehensive career advisement system must undergird each of these efforts to strengthen the quality and rigor of career programming. Career advisement must start in middle school with a focus on raising students' awareness of various careers and exploring what workers do in different fields. It then must progress in high school to greater exposure to local industries and companies to develop deeper interest and understanding of professional roles, and ultimately, identify an intended career path and route to get there. MCPS's school counselors will be essential to supporting and driving this work, and they must be trained to execute this role. In addition, the full functionality of Naviance's Career Key Assessment Tool must be examined to determine if it can be better utilized to help middle school

students explore career options and create a specific academic and career plan for high school that tentatively maps out the courses that are best aligned with their demonstrated career interests.

But the work cannot stop there. MCPS must supplement the technology solution and school counselors with college and career coaching that helps students investigate a variety of career options aligned with the longer-term economic development priorities of Montgomery County, and then use that information to make informed decisions about high school course enrollment and postsecondary plans. It is essential that this coaching happen as a component of the regular school day, not during free/social times like lunch when it is easy for students to forgo the opportunity.

Done well, this coaching will likely require specialized expertise beyond what is currently available in MCPS. There are two strategies MCPS might employ to implement this recommendation. MCPS might first look to its industry and postsecondary education partners to determine if they have the expertise and willingness to provide such a service. Modifying the current ACES program, for example, might be one option to explore. If not, MCPS might investigate other options, such as contracting with a specialized organization to provide expertise, like Career Compass being used in Louisiana; and/or collaborating with local postsecondary institutions to design, build, and offer a career coaching program, much like Arkansas has done. Locally, Carroll County is known for its longstanding, high-quality work in designing and implementing a K-12 career development program. Then, once that expertise is secured, MCPS might launch a demonstration project in a handful of high schools, especially those that serve students who are least likely to have access to career planning resources at home, and strategically scale that program over several years to all MCPS high schools.

Increase Teacher Capacity

While ESG's external assessment of MCPS career preparation practices did not focus explicitly on instructional capacity, the need for better or more highly-effective CTE teachers emerged throughout conversations with stakeholders. To increase capacity of existing CTE teachers, MCPS might consider employing strategies like Louisiana has done through its Jump Start Initiative that require teachers to earn high-quality industry-recognized credentials in the fields they teach and provide professional development to enable them to do so. It might also consider working with its employer partners to offer high-quality, paid summer externships to CTE and STEM teachers to help deepen their understanding of how the content they teach is applied in real-life settings. The Georgia Intern Fellowship for Teachers (GIFT) offered through Georgia Tech is one model to study.

To recruit higher capacity industry professionals who often are deterred by teaching opportunities because they cannot leave their industry work completely, MCPS might follow the example of several states that have begun to allow industry experts to teach part-time or co-teach with a fully-certified teacher of record. Finally, MCPS, in its work to strengthen its partnership with postsecondary institutions, should investigate the possibility of contracting with postsecondary partners like Montgomery College to dedicate faculty with industry experience to teaching CTE courses for MCPS, within and outside of dual enrollment.

Redesign Organizational Structure

Organization and capacity at the district level needs to support a cohesive approach and shared accountability for results based on the new vision for career readiness. This requires that CTE be organized thoughtfully under one central leader with deep knowledge of academic and technical priorities of MCPS, experience beyond CTE, a keen understanding of how to blend CTE into the broader college-preparatory strategy, and the acumen to execute that vision. Such a leader must have the understanding, skill, and relationships to work hand-in-hand with executive-level postsecondary and industry leaders to develop a delivery system that seamlessly spans secondary and postsecondary systems to meet the dynamic needs of the regional labor market. And above all else, this leader must believe deeply in the need for change in MCPS's career preparation efforts, demonstrating the capacity and willingness to assess and retire lower-quality legacy programs while building high-quality models of 21st century career programming.

Measure and Incentivize Career Readiness

To support and drive effective changes to instructional practice, MCPS must create an accountability system that values completion of high-quality programs of study and attainment of stackable industry-recognized credentials that prepare students for high-skill, high-demand career opportunities. ESG's recently released report, Destination Known: Valuing College and Career Readiness in State Accountability Systems offers clear direction on measures that can be included within an accountability system to support all students in reaching economic and career success. While it is written for states, its recommendations can be adapted by districts for full or partial inclusion in their reporting and accountability efforts. It is framed around four robust measures of college and career readiness: 1) progress toward post-high school credential, 2) co-curricular learning and leadership experiences such as work-based learning, 3) assessment of readiness, and 4) transitions beyond high school.

As part of its effort to strengthen the college and career readiness measures by which it holds itself accountable, MCPS should create a dashboard that monitors performance of students in programs of study compared to other students in the district, and develop routines in the central office to monitor and review those results. Implicit within this recommendation is ensuring that MCPS's data collections represent actual enrollment, concentration, and completion. If necessary, MCPS should hire a qualified 3rd party to audit data to identify where improvements in data collection and reporting are needed. Maryland State Department of Education may be able to assist in this process.

Focus Area #4: Edison School of Technology

With a new, state-of-the-art facility comes opportunity for change and reinvention. MCPS must leverage this unreservedly by redesigning the Edison model and redefining its vision and mission, situating it intentionally as an integral piece of the new district-wide career readiness vision. There are several forms this can take, each that will

Edison must become a full-time model to become a highly-successful, fully-subscribed educational opportunity for the students and families it serves.

result in varying degrees of transformational change depending upon MCPS's appetite and resource level as well as the political will of its most important partners. All of the options described below contemplate a full-time model, which ESG believes is the only way for Edison to become a highly-successful, fully-subscribed educational opportunity for the students and families it serves. This will alleviate a considerable amount of the concern around geographical placement of Edison, student travel time, and loss of a class period that currently surfaces in conversation about Edison.

Visionary Transformation: Recreate Edison as a CTE Early College High School

Like all Early College High Schools (ECHS), the new "Thomas Edison CTE Early College High School" would blend high school and college coursework to enable students to simultaneously earn a high school diploma as well as either an associate degree or up to two years of credit toward a bachelor's degree. As a CTE-ECHS, Edison would differentiate itself from other ECHS by focusing its program exclusively on the high-skill, high-demand industry sectors of Montgomery County so that students could earn a postsecondary-level industry credential that signals their readiness for sought-after job opportunities. As a CTE-ECHS, MCPS could opt to focus on serving a specific student population, such as students who are most at-risk of not going on to postsecondary education and training after high school, or it could open the opportunity to all students district-wide or those currently enrolled in schools with overcrowding, for example. Selecting this model would require the commitment and will of a strong higher education partner as well as employers and economic development experts to collaboratively conceptualize, design, and bring to fruition this vision for an ECHS.

Strong CTE-ECHS models across the country provide examples that MCPS may be served well to draw from, including the CEC (Career Education Center) Early College High School in Denver, Colorado. The STEMM Technical Middle College in Hagerstown might also be an example to study. In addition, Texas legislated the CTE Early College High School Initiative in 2014 and would likely have valuable lessons to share with MCPS on designing and bringing to fruition a high-quality model.

Full Transformation: Recreate Edison as a Wall-to Wall Career Academy

Not quite as radical a transformation as an ECHS, redesigning Edison as a wall-to-wall career academy would significantly strengthen students' academic knowledge and technical skills nonetheless while preparing them for a two- or four-year college or university program. As opposed to an ECHS model, coursework would primarily be delivered at the high school level with opportunities for high-quality dual enrollment/credit, but it would be rigorous and relevant, anchored strongly in a specific career focus. The school would be divided into a number of "academies" – small learning communities focused on a particular high-skill, high-demand industry sector of Montgomery County, like healthcare or cybersecurity for example – and each student in ninth grade would select one of these to "major in" during 10th-12th grades thereby receiving rigorous academic instruction in traditional core subjects like math, English, and science integrated with 21st century CTE programming. This model, which could be phased in over four years beginning with an inaugural ninth grade class, demands that the Edison Career Academy effectively engage the employer community for programmatic design and delivery protocols as well as authentic workplace experiences that are connected to classroom learning for each of the academies.

Wall-to-wall career academies have been successful in a number of places that MCPS might emulate, including in Virginia, with its expansion of Governor's STEM Academies throughout the state, and in Nashville with the conversion of all 12 of its high schools to wall-to-wall Academies. At an individual school level, the Network Engineering Program at Summit Technology Academy in Lee's Summit, Missouri was recently recognized by Advance CTE with an Excellence in Action Award. Bringing together students from urban, suburban, and rural high schools, the program does exceptional work preparing students for cybersecurity career opportunities. Most notably, students are able to begin work on a bachelor's degree while enrolled at the Academy, thereby dramatically increasing the likelihood that they'll go on to earn a 4-year degree after high school graduation. As Advance CTE notes, 60% of its students participate in work-based learning, 60% earned college credit through dual enrollment, 94% enrolled in postsecondary education, the workforce, or the military after graduation, and 81% earned an industry-recognized credential.

Integrated Transformation: Combine Edison High School with Wheaton High School

Two schools sit side-by-side, each with a STEM focus, one significantly under-enrolled while the other searches for nooks to turn into classroom space to accommodate its burgeoning student population. They have potential to be highly complementary, the combination of the two potentially offering an integrated, comprehensive student experience enriched by rigorous project-based learning instruction in one facility and sophisticated hands-on technical instruction in the other that brings to life the application of learning. Key to effectively combining these two schools would be a singular leader with the vision, knowledge, and skill to define each as equal parts that together make a whole, with strong site-based leadership in each building to help turn that vision into reality.

Limited Transformation: Convert Edison to a Fulltime Technology High School

In considering its options for the new Edison, MCPS should not overlook perhaps the simplest transformation that would yield significantly better results: converting Edison to a fulltime technical high school. To make this pay dividends, Edison must embody high-quality career-technical programming. It must offer sophisticated programs of study aligned with high-skill, high-demand labor market needs. Those programs of study must infuse rigorous academic instruction, including honors, AP/IB, and dual enrollment/credit courses, with technical training that can only be found on that campus. They must require a relevant work-based learning experience that is aligned with the programs of study and assessed meaningfully by employers. All current programs of study must be vigorously evaluated against specific criteria, and lower-level programs must be removed or phased out. School leadership must understand and embrace the underlying philosophy of college and career readiness and the role of pathways to achieve that. School leadership also must be facile in the use of a master schedule, cohort schedule, and common planning time, as well as have a strong commitment to work-based learning for all, thematic teaching, and building the capacity of teachers to integrate academic and technical instruction.

Edison must embody high-quality career-technical programming.

The Sussex Technical High School of Choice in Georgetown, Delaware is a model that MCPS might study closely in thinking about how to convert Edison into a fulltime technical high school. As a National School of Excellence, Sussex Tech enjoys name and brand recognition in its community with families actively seeking out the opportunity to enroll there. It offers rigorous 21st century career pathways that are integrated with advanced coursework opportunities, with one-third of its students participating in AP. Students consistently achieve at high levels and dually enroll in their junior and senior years at Widener University. In addition, Sussex Tech offers adult education classes in the evening to serve an additional population of need. And locally, Eastern Technical High School in Baltimore County, an award-winning school frequently recognized by the US Department of Education for outstanding academic achievement, might also be a model that holds some valuable lessons from which MCPS can draw.

Irrespective of the model MCPS chooses for Edison, it must rebrand the school with a new name, new website, and new program offerings that represent valuable career opportunities of today and tomorrow, such as homeland security, Cisco IT, Lodging Management, Interactive Media Production, and Transportation, Distribution, and Logistics to show that the building is not the only thing that is new. It is an altogether new day at Edison.

Finally, if demand for a high-quality full-time model increases significantly as a result of making such changes to Edison, or if MCPS already sees the need for more than one such site, it might consider undertaking a feasibility study that examines two ideas: 1) building a new full-time technical high school that takes one of the forms described above in another part of the county to balance the geographic challenges of Edison, and 2) converting an existing MCPS high school on the other side of the county into a technical high school that takes one of the forms described above to address geographic challenges of Edison and satisfy growing demand.

Focus Area #5: Stakeholder Understanding

Finally, once MCPS has made significant progress in establishing the new vision, cultivating strong relationships and purpose with the employer community, strengthening the rigor and distribution of programs of study, and deciding on transformative plans for Edison, MCPS must not overlook the crucial final step. With the help of dedicated external communication professionals, it must clearly, strongly, and widely communicate with the full range of its stakeholders to help them understand and buy into the importance of its career readiness work. This must happen through deliberate staging, and the order in which those stages of communication are rolled out is paramount.

*This is about maintaining high expectations for **all** students and preparing them for **the full range of opportunities** that lead to prosperous futures so that they have every choice available to them.*

External Branding Campaign

Given the deep lack of understanding of today's economy on the part of all immediate stakeholders, MCPS must establish a new value proposition through an external communications/branding campaign that educates stakeholders on recent economic changes and the related implications of how to effectively prepare students for meaningful professional roles within it. It must deepen the

understanding of middle and high school students, parents, teachers, administrators, and counselors regarding how economic shifts have created new, substantial career opportunities that require different experiences and qualifications. These new opportunities can offer benefit and stability traditionally associated with a four-year degree; for example, nearly one-third of associate degree holders now earn higher salaries than bachelor's degree holders. The campaign must emphasize that this is about maintaining high expectations for *all* students and preparing them for the *full range of opportunities* that lead to prosperous futures so that they have every choice available to them. The Georgetown Center on Education and the Workforce is a national leader in explaining the connections between education, career qualifications, and workforce needs and may be a helpful source in providing economic information to MCPS and its stakeholders.

Deepen Understanding of College and Career Readiness

The next level of that branding campaign must bring to life in a tangible and compelling way MCPS's new vision of career readiness (described in the first recommendations section), one that integrates and values career preparation alongside college preparation. Stakeholders will need help in the form of information and resources to understand how the full range of career programming – from advisement to integrated academic and technical instruction to work-based learning, dual enrollment, and industry-recognized credentials - can and should be an integral part of a rigorous college preparation strategy. And it must illustrate how high school schedules can include both college and career-focused courses in a way that does not diminish a student's chances of gaining entrance to elite colleges.

Demonstrate CTE as an Essential Link to Career Readiness

The third and final layer of that branding campaign will be to clearly show the essential link between high-quality CTE (perhaps renamed as suggested earlier) and career programming. This must be done in a way that convincingly explains the full range of what CTE entails and why it's a valuable option for all students. It must delineate various CTE offerings, such as Project Lead the Way, National Academies Foundation, Cisco, and Middle College, and tout their connection to preparing students for postsecondary success. And it must intentionally target long-held misconceptions about the quality of CTE in part by describing changes MCPS is making to ensure that its CTE programs are of unassailable quality and widely accessible to all students. Once that is established, stakeholders may be ready for more specific and nuanced information about the availability of this high-quality CTE in their schools. Advance CTE has done substantial work on strategies to effectively recruit students into CTE, and their resources may be helpful to MCPS.

Sustain the Momentum of this Branding Campaign

This branding campaign cannot be a passing effort to raise the awareness and respect of stakeholders for the value of career preparation. It must be leveraged and followed by new modes of ongoing communication with stakeholders that is efficient and responsive to the way parents and students communicate, e.g. text messaging, social media, even online grading and reporting systems and other places where students and parents routinely visit. It must receive the same level of investment that the college readiness agenda required to take root and flourish, and, importantly, it must be seen as an extension of, not an alternative to, that agenda. Otherwise, it will not have long-term impact and won't

successfully broaden people's understanding and appreciation for the experiences young people need to be well prepared after high school. Finally, to ensure that its communications efforts "stick", MCPS should solicit on-going feedback from its stakeholders to identify which messages have been well received and understood, and where there is need for changes going forward.

Recommendations

Focus Area #1: Vision and Systemic Priorities for Career Readiness	**MCPS must partner with industry and postsecondary leaders to establish career readiness as a priority in preparing students for postsecondary success.**

- ***Establish a new vision for career readiness*** that complements MCPS's college-ready goals.
- ***Redefine and rebrand CTE*** as offering rigorous academic coursework integrated with 21st century technical instruction and real-world work experiences.
- ***Design and provide professional development on the regional labor market*** and the related high-value career opportunities to teachers, counselors, and administrators to help them understand the range of meaningful professional roles available after high school.
- ***Establish metrics for career readiness success*** to undergird the importance of the work, including program of study completion in high-skill, high-demand fields; work-based learning participation; dual credit rates; and attainment of industry-recognized credentials with labor market value.

Focus Area #2: Employer Engagement/Demand-Driven Programming	**Employers must become strong partners in realizing MCPS's new vision of career readiness, which includes having the opportunity to help identify programs of study that should be prioritized and scaled and assess their effectiveness.**

- ***Regularly convene leading employers*** through a specialized Advisory Council led by the Superintendent to identify programmatic priorities for the district and set direction for the work of the current intermediary organizations.
- ***Restructure and redefine the role of the Montgomery County Collaboration Board (MCCB)*** so it can more effectively ensure that career preparation programs are targeted in the right career sectors and are achieving results.
- ***Establish a single point of contact within MCPS for employers,*** a "Director of Strategic Industry Partnerships", to manage the work of the Council and build a full portfolio of work-based learning experiences for students.

Focus Area #3: Quality and Rigor of CTE	**Once the new vision for career readiness has been established, MCPS must leverage the work of the Superintendent's Advisory Council to strengthen the quality and consistency of its career programming. The district needs to ensure that programs of study are rigorous and enable students to graduate with college credit and postsecondary-level industry-recognized credentials.**

- ***Design and execute a systematic approach*** to the delivery of career programming across schools ensuring that every student has access to a high-quality program of study of his/her choice.
- ***Redesign Programs of Study*** so that they offer honors and college-level course-taking opportunities through grade 14 and integrate rigorous and relevant work-based learning experiences.
- ***Reorganize CTE under one central leader*** with deep knowledge of the district's academic and technical priorities and the acumen to execute on the new career readiness vision.
- ***Reconfigure the district's accountability system*** so that values program of study completion and attainment of college credit and stackable credentials.

Focus Area #4: Edison School of Technology	**The "new Edison" currently under construction makes room for change and reinvention. MCPS should take this opportunity to address shortcomings in the current model, situating the new school as an integral piece of the career readiness vision. There are four paths to consider, each of which requires converting Edison into a full-time school:**

- ***Create a CTE Early College High School*** that, like other Early College High Schools, would enable students to simultaneously earn a high school diploma and either an associate degree or up to two years of credit toward a bachelor's degree.
- ***Design a Wall-to-Wall Career Academy*** that would be divided into a number of high-skill, high-demand "academies"; each student would "major" in an academy and receive rigorous academic and technical instruction culminating in college-credit and a postsecondary industry-recognized credential.
- ***Combine Edison and Wheaton,*** taking advantage of the natural opportunity of side-by-side campuses to offer a rigorous project-based learning experience alongside sophisticated hands-on technical instruction.
- ***Convert to a technology high school*** taking care to assess programmatic offerings and their quality carefully to ensure high quality and develop a strategic plan for implementation with postsecondary and industry partners.

Focus Area #5: Stakeholder Understanding	**Leveraging external professionals, MCPS must clearly and widely communicate to help stakeholders understand the importance of its career readiness work. This can happen through deliberate phasing:**

- ***Establish a new value proposition for career readiness*** that educates stakeholders on recent economic changes and the related implications for career opportunities.
- ***Implement a branding campaign*** that brings to life MCPS's new career readiness vision that integrates and values career preparation alongside college preparation.
- ***Make the case for high-quality CTE as a component of career readiness*** explaining what CTE entails, delineating CTE offerings and their connection to postsecondary options, targeting long-held misconceptions about CTE quality, and advertising recent CTE changes to ensure unassailable quality.

Conclusion

MCPS should be commended for seeking out this opportunity to have an external firm rigorously review its policies and practices, identify areas of need, and map an ambitious action plan for improvement. In so doing, MCPS has positioned itself to be a leader in this work across the country. While economic shifts have compelled a growing movement of states and districts nationwide to focus on strengthening and scaling career readiness practices and aligning them with their college preparation efforts, few have done the tough work that comes with self-scrutiny and comprehensive planning.

In turning the corner from planning into doing, MCPS cannot lose sight of the importance of partners in this work. While MCPS must lead on implementation, long-term success will be dependent upon strong engagement with the employer community and transformational collaboration with postsecondary education partners like Montgomery College and the Universities at Shady Grove. Together, MCPS and its partners can make certain that every student graduates high school with the knowledge and skills to be ready for success in both college and careers.

Appendix

Appendix A: Data Analysis Tables

Maryland CTE Enrollment by District, All Programs

District	2014	2015	2016	Change
MCPS	13964	13557	13323	-5%
Anne Arundel	7161	8104	7324	2%
Baltimore	11724	14422	15409	31%
Frederick	6599	6647	6968	6%
Howard	5408	5714	5883	9%
Prince George's	6068	6790	7390	22%

MCPS CTE Enrollment by Program of Study

Program	2014	2015	2016	Change
Arts, Media, and Communication	619	145	642	4%
Business Management and Finance	2,398	2,311	1,614	-33%
Construction and Development	321	336	197	-39%
Career Research and Development	997	1,000	982	-2%
Consumer Services, Hospitality and Tourism	720	814	800	11%
Environmental, Agricultural and Natural Resources	69	112	122	77%
Health and Biosciences	1,122	1,260	1,341	20%
Human Resource Services	2,298	2,280	2,994	30%
Information Technology	1,841	1,563	1,118	-39%
Manufacturing, Engineering and Technology	3,253	3,394	3,184	-2%
Transportation Technologies	326	342	329	1%
TOTAL	13964	13557	13323	-5%

MD Perkins Data by District

District	Year	Academic Attainment-English	Academic Attainment-Math	Dual Completion	Technical Skill Attainment	Placement	Non-Traditional Enrollment	Non-Traditional Completion
Anne Arundel	2016	82.6%	90.4%	53.3%	87.7%	98.0%	98.8%	80.8%
Baltimore	2016	98.8%	99.2%	74.0%	79.0%	98.5%	99.7%	83.8%
Frederick	2016	88.1%	99.6%	58.4%	93.4%	99.4%	99.4%	84.2%
Howard	2016	98.8%	98.5%	51.3%	95.9%	99.7%	99.8%	88.5%
Montgomery	2016	98.2%	97.6%	31.3%	88.5%	99.5%	99.6%	83.2%
Prince George's	2016	59.9%	62.0%	28.4%	67.1%	99.6%	99.8%	75.2%
State	2016	86.7%	91.5%	58.1%	82.4%	98.5%	99.3%	80.9%
Anne Arundel	2015	83.8%	89.6%	48.8%	85.0%	95.6%	97.9%	65.4%
Baltimore	2015	82.9%	84.3%	73.3%	60.7%	98.8%	99.7%	80.5%
Frederick	2015	87.2%	93.7%	49.0%	89.8%	97.3%	98.8%	83.8%
Howard	2015	90.1%	95.0%	66.5%	79.2%	98.7%	97.7%	83.3%
Montgomery	2015	79.4%	87.3%	57.6%	93.7%	98.3%	99.5%	76.4%
Prince George's	2015	71.3%	69.7%	36.6%	67.0%	97.7%	99.5%	69.1%
State	2015	79.9%	85.3%	61.0%	79.5%	97.7%	99.0%	76.2%
Anne Arundel	2014	83.8%	90.7%	49.1%	89.1%	94.7%	97.3%	60.4%
Baltimore	2014	84.8%	88.5%	72.5%	91.0%	98.4%	99.6%	81.6%
Frederick	2014	90.4%	94.2%	70.7%	91.4%	99.3%	99.6%	80.2%
Howard	2014	92.4%	96.2%	75.8%	79.8%	99.5%	98.8%	89.3%
Montgomery	2014	82.6%	86.3%	57.8%	85.8%	98.9%	99.8%	75.0%
Prince George's	2014	76.5%	73.9%	20.4%	63.7%	96.1%	98.9%	73.5%
State	2014	81.9%	86.4%	60.0%	76.9%	97.8%	98.9%	75.9%

* Green is above state goal. Red is below state goal. Does not include graduation indicators, which are universally high (>98%).

MCPS Pathway Enrollment, Concentration and Completion (2015-16)

Program of Study	# of CTE Enrollees	% of CTE Enrollees	# of CTE Concentrators	% of CTE Concentrators	# of CTE Completers	% of CTE Completers
All	5808	55.1	1923	18.2	1019	9.7
Arts, Humanities, Media, Comms	345	3.3	60	≥1.0	≥15	≥1.0
Biosciences, Health Science, and Medicine	458	4.3	138	1.3	91	≥1.0
Business Management and Finance	1219	11.6	307	2.9	106	≥1.0
College and Career R&D	537	5.1	305	2.9	255	2.4
Construction and Dev't	78	≥1.0	59	≥1.0	40	≥1.0
Education, Training, and Child Studies	1258	11.9	250	2.4	149	1.4
Engineering, Scientific Research, and Manufacturing Technologies	2229	21.1	229	2.2	115	1.1
Environmental, Agricultural, and Natural Resources	54	≥1.0	22	≥1.0	≥15	≥1.0
Human and Consumer Srv, Hospitality, and Tourism	561	5.3	129	1.2	44	≥1.0
Information Technologies	549	5.2	206	2.0	49	≥1.0
Law, Government, Public Safety, Administration	210	2.0	137	1.3	56	≥1.0
Transportation, Distribution, and Logistics	166	1.6	117	1.1	97	≥1.0

* Percentages based on total high school graduates.

Appendix B: Survey Questions

Teacher/Administrator Survey

Overview of Teacher/Administrator Survey: Montgomery County Public Schools (MCPS) has hired Education Strategy Group (ESG) to review MCPS's career readiness services, including Career and Technology Education (CTE). ESG has worked extensively with states and their districts across the country to help them rethink and reshape their career readiness efforts to help more students graduate high school ready for a wide range of valuable postsecondary opportunities. Your honest and straightforward feedback on this survey is important in helping ESG identify what MCPS does very well and where it has room to grow so that ESG can offer thoughtful recommendations for improvement.

Name of MCPS School: (drop down menu listing all high schools)

1. BCC HS
2. Edison HS
3. Gaithersburg HS
4. Paint Branch HS
5. Poolesville HS
6. Quince Orchard HS
7. Rockville HS
8. Seneca Valley HS
9. Springbrook HS
10. Watkins Mill HS
11. Wheaton HS

Survey Participant: "select all that apply"

- STEM Teacher (Science, Technology, Engineering, Math)
- CTE Teacher
- Teacher, not CTE or STEM
- School Administrator

Directions: For each of the statements below, please select the answer choice that best represents what you think of career and technology education (CTE) and related opportunities at your school and in MCPS. If you do not know enough to respond to a statement, select "don't know" as your answer choice and move on to the next statement. All responses are anonymous and confidential and cannot be traced back to you.

1 = Strongly Disagree 2 = Disagree 3 = Agree 4 = Strongly Agree OR: "Don't Know"

1. High school 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.
2. Students who earn an associate degree or an industry certificate (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.
3. Within the next several years, the U.S. economy will need nearly equal numbers of associate degree and bachelor's degree holders.
4. MCPS 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.
5. MCPS must prioritize increasing the number of students who earn industry certifications with labor market value much like they prioritize increasing the number of students who take and pass AP and IB exams.
6. MCPS facilitates strong partnerships with a wide array of local businesses giving students access to internships and other real-world work experiences.
7. Staff need more information on the career preparation opportunities that are available in MCPS.
8. School counselors in MCPS help middle and high school students understand the wide range of career opportunities that are available and valuable after high school.
9. Naviance is used effectively to help MCPS students understand the range of meaningful opportunities available after high school and set goals to reach those.
10. I believe that work-based learning experiences in MCPS that range from career exploration to career training give all students – those going to a 4-year college as well as those going to a 2-year college, apprenticeships, or workplace - insight into the range of careers available to help them make informed choices about their long-term goals and plans.
11. The quality of instruction students receive in CTE classes is as strong as the quality they receive in core academic classes.
12. CTE is for students who don't plan to go to college.
13. CTE in MCPS offers challenging, rigorous programs of study for all students that develop the academic knowledge and technical skills to prepare them for college and a career.
14. CTE in MCPS enables students to develop sophisticated, specialized skills that will prepare them for robust and stable professional roles in a competitive, global economy.
15. MCPS strongly encourages students to dually enroll at Montgomery College and other colleges as part of their CTE program of study.

16. Thomas Edison School of Technology offers innovative, cutting edge technical programs of study for all students, including high-achieving students who plan to go to a 4-year college.
17. New high-skill, high-demand CTE programs of study should be added to the offerings made available through Thomas Edison School of Technology, not to comprehensive high schools.

STEM/CTE Teachers Only:

1. As a high school STEM or CTE teacher in MCPS, 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.
2. MCPS offers professional development opportunities and incentives that enable STEM and CTE teachers to earn industry certifications to strengthen their instructional practices in the high-skill, high-demand fields for which they prepare all students.
3. As a STEM or CTE teacher in MCPS, 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 all students.

Student Survey

Overview of Student Survey: Montgomery County Public Schools (MCPS) provides opportunities for high school students like you to receive Career and Technology Education (CTE). This includes programs like Informational Technology, Hospitality Management, Engineering, Accounting, and Construction Trades. We are working to make CTE programs better by asking students to give us feedback on their experience. We also want to learn how much information students have about the CTE programs MCPS offers.

Montgomery County Public Schools (MCPS) has hired Education Strategy Group (ESG) to review MCPS's Career and Technology Education programs. ESG has worked with other districts and state education departments to improve career readiness. Your honest and straightforward feedback on this survey is important in helping ESG identify what MCPS does very well and where it has room to grow so that ESG can offer thoughtful recommendations for improvement.

Name of MCPS School: MCPS, insert drop down menu listing the participating high schools:

- BCC
- Gaithersburg
- Paint Branch
- Poolesville
- Quince Orchard
- Rockville
- Seneca Valley
- Springbrook
- Watkins Mill
- Wheaton

Grade: drop down menu: 9, 10, 11, 12)

Survey Participant: ☐Female

☐Male

CTE Experience: ☐Do you take CTE courses at your school? Y/N

☐Do you take CTE courses at Thomas Edison High School of Technology? Y/N

Directions: For each of the statements below, please select the answer choice that best represents what you think of career and technology education (CTE) and related opportunities at your school and in MCPS. If you do not know enough to respond to a statement, select "don't know" as your answer choice

and move on to the next statement. All responses are anonymous and confidential and cannot be traced back to you.

1 = Strongly Disagree 2 = Disagree 3 = Agree 4 = Strongly Agree OR: "Don't Know"

1. I must continue my 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.
2. If I earn an associate degree or an industry certification (that tells employers I have skills needed for a job) in an in-demand field, I will have a wide range of professional opportunities available to me that offer good salaries.
3. Students who enroll in Career and Technology Education (CTE) and complete a program of study in high school can attend a 4-year college or university after high school graduation.
4. I believe that schools should prepare 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.
5. My school offers me meaningful opportunities to participate in high-quality real-world work experiences like internships that develop important skills.
6. I am aware of the range of CTE programs offered throughout MCPS including those offered at Thomas Edison School of Technology.
7. Students need more information on the career preparation opportunities that are available throughout MCPS.
8. My school counselor helps me understand the wide range of career opportunities that are available and valuable after high school.
9. I use Naviance to understand the range of meaningful opportunities available after high school and set goals to reach those.
10. I believe MCPS strongly encourages me to take classes at Montgomery College and other colleges as part of a CTE programs of study.
11. I think that CTE is for students who don't plan to go to college.
12. CTE in MCPS offers challenging, rigorous programs of study for all students that develop the academic knowledge and technical skills to prepare students for college and a career.
13. I think the quality of instruction students receive in CTE classes is as strong as the quality they receive in core academic classes.
14. I wish there were more CTE programs at my school in high-skill, high-demand fields such as healthcare, advanced manufacturing, and information technology.
15. I would prefer to take CTE courses at my local high school rather than take them at the Thomas Edison School of Technology.

16. I would be more likely to enroll at Thomas Edison High School of Technology **if**: "Select all that apply"

    - I could go there full time instead of taking only a few of my classes there.
    - The school offered more advanced academic courses like AP.
    - The school was located closer to me.

Counselor Survey

Overview of Counselor Survey: Montgomery County Public Schools (MCPS) has hired Education Strategy Group (ESG) to review MCPS's career readiness services, including Career and Technology Education (CTE). ESG has worked extensively with states and their districts across the country to help them rethink and reshape their career readiness efforts to help more students graduate high school ready for a wide range of valuable postsecondary opportunities. Your honest and straightforward feedback on this survey is important in helping ESG identify what MCPS does very well and where it has room to grow so that ESG can offer thoughtful recommendations for improvement.

Name of MCPS School: (drop down menu listing all high schools)

12. BCC HS
13. Edison HS
14. Gaithersburg HS
15. Paint Branch HS
16. Poolesville HS
17. Quince Orchard HS
18. Rockville HS
19. Seneca Valley HS
20. Springbrook HS
21. Watkins Mill HS
22. Wheaton HS

Survey Participant: ☐Middle School Counselor

☐High School Counselor

☐High School College/Career Information Coordinator (CCIC)

Directions: For each of the statements below, please select the answer choice that best represents what you think of career and technology education (CTE) and related opportunities at your school and in MCPS. If you do not know enough to respond to a statement, select "don't know" as your answer choice and move on to the next statement. All responses are anonymous and confidential and cannot be traced back to you.

1 = Strongly Disagree 2 = Disagree 3 = Agree 4 = Strongly Agree OR: "Don't Know"

18. High school 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.

19. Students who earn an associate degree or an industry certificate (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.
20. Within the next several years, the U.S. economy will need nearly equal numbers of associate degree and bachelor's degree holders.
21. MCPS 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.
22. MCPS must prioritize increasing the number of students who earn industry certifications with labor market value much like they prioritize increasing the number of students who take and pass AP and IB exams.
23. MCPS facilitates strong partnerships with a wide array of local businesses giving students access to internships and other real-world work experiences.
24. Staff need more information on the career preparation opportunities that are available in MCPS.
25. School counselors in MCPS help middle and high school students understand the wide range of career opportunities that are available and valuable after high school.
26. Naviance is used effectively to help MCPS students understand the range of meaningful opportunities available after high school and set goals to reach those.
27. I believe that work-based learning experiences in MCPS that range from career exploration to career training give all students – those going to a 4-year college as well as those going to a 2-year college, apprenticeships, or workplace - insight into the range of careers available to help them make informed choices about their long-term goals and plans.
28. The quality of instruction students receive in CTE classes is as strong as the quality they receive in core academic classes.
29. CTE is for students who don't plan to go to college.
30. CTE in MCPS offers challenging, rigorous programs of study for all students that develop the academic knowledge and technical skills to prepare them for college and a career.
31. CTE in MCPS enables students to develop sophisticated, specialized skills that will prepare them for robust and stable professional roles in a competitive, global economy.
32. MCPS strongly encourages students to dually enroll at Montgomery College and other colleges as part of their CTE program of study.
33. Thomas Edison School of Technology offers innovative, cutting edge technical programs of study for all students, including high-achieving students who plan to go to a 4-year college.
34. New high-skill, high-demand CTE programs of study should be added to the offerings made available through Thomas Edison School of Technology, not to comprehensive high schools.

35. I fully understand the opportunities students have in high-skill, high-demand industries like healthcare, advanced manufacturing, and IT that do not require a 4-year degree and provide stable employment in professional roles that pay a family-sustaining wage.

36. I believe I have the knowledge and preparation needed to help every student develop an individualized learning plan that includes specific career objectives, a related program of study, degree and/or industry certificate objectives, and specific strategies to reach employers.

Business & Industry Survey

Overview of Business & Industry Survey: Montgomery County Public Schools (MCPS) has hired Education Strategy Group (ESG) to review MCPS's career readiness services, including Career and Technology Education (CTE). ESG has worked extensively with states and their districts across the country to help them rethink and reshape their career readiness efforts to help more students graduate high school ready for a wide range of valuable postsecondary opportunities. Your honest and straightforward feedback on this survey is important in helping ESG identify what MCPS does very well and where it has room to grow so that ESG can offer thoughtful recommendations for improvement.

Survey Participant: ☐ Business Leader ☐ Industry Association Member ☐ MCCB Member

(*Check all that apply*) ☐ MCBRE Member ☐ Local Chamber Member

Directions: For each of the statements below, please select the answer choice that best represents what you think of employers' work with MCPS to prepare students for meaningful career opportunities. If you do not know enough to respond to a statement, select "don't know" as your answer choice and move on to the next statement. All responses are anonymous and confidential and cannot be attributed to you.

1 = Strongly Disagree 2 = Disagree 3 = Agree 4 = Strongly Agree OR: "Don't Know"

1. There is broad participation of Montgomery County employers across key industries working in partnership with Montgomery County Public Schools (MCPS) on its career readiness programs.
2. Employers in Montgomery County lead a process with MCPS that uses labor market data to determine which new career-technology education (CTE) programs are needed and which are no longer relevant to the growing regional economy.
3. Employers in Montgomery County lead a process with MCPS to identify the academic knowledge, technical skills, and professional skills students need to be successful in high-skill, high-demand industries.
4. Employers in Montgomery County are willing to offer high-quality work-based learning experiences for MCPS high school students that progress from career awareness and exploration (e.g. job shadowing) to preparation and training (e.g. internships).
5. Employers in Montgomery County are willing to design high-quality work-based learning experiences that develop skills and competencies in students that are aligned with industry needs.
6. Employers in Montgomery County see work-based learning experiences with MCPS students as an effective vehicle through which to grow and develop their own talent pipeline.
7. Employers in Montgomery County are willing to assess students' work-based learning performance and provide formal feedback to MCPS.

8. In order to scale work-based learning experiences to all MCPS students, employers must have a single, reliable point of contact within MCPS that will coordinate and manage all related efforts.
9. Legal restrictions on minors in certain workplace settings interfere with employers' interest in offering work-based learning experiences to MCPS students.
10. The 2:30 p.m. dismissal time of MCPS high schools makes it difficult for employers in Montgomery County to offer work-based learning experiences.
11. MCPS graduates who find gainful employment in Montgomery County after high school generally have the academic knowledge needed to be successful in entry-level positions in high-skill, high-demand fields such as those in healthcare, advanced manufacturing, and IT.
12. MCPS graduates who find gainful employment in Montgomery County after high school generally have the technical skills needed to be successful in entry-level positions in high-skill, high-demand fields.
13. MCPS graduates who find gainful employment in Montgomery County after high school generally have the professional skills (i.e. problem solving, communication, teamwork) needed to be successful in entry-level positions in high-skill, high-demand fields.
14. Employers in Montgomery County use Industry-recognized credentials to recruit and hire qualified candidates.
15. Employers in Montgomery County are willing to provide teacher externships that allow high school CTE and STEM teachers to spend extended time in a workplace to strengthen their knowledge and skills and establish concrete connections between classroom learning and its application.
16. Employers in Montgomery County are willing to help MCPS secure public-private partnerships that help recruit industry professionals into classrooms as teachers to better prepare students for work in high-skill, high-demand fields like healthcare, advanced manufacturing, and IT.

Appendix C: Survey Results

MCPS Student Responses	Strong Agree	Agree	Disagree	Strong Disagree	Don't Know
I must continue my 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.	62%	24%	3%	4%	6%
If I earn an associate degree or an industry certification (that tells employers I have skills needed for a job) in an in-demand field, I will have a wide range of professional opportunities available to me that offer good salaries.	29%	44%	7%	3%	17%
Students who enroll in Career and Technology Education (CTE) and complete a program of study in high school can attend a 4-year college or university after high school graduation.	20%	37%	6%	3%	34%
I believe that schools should prepare 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.	45%	36%	4%	3%	12%
My school offers me meaningful opportunities to participate in high-quality real-world work experiences like internships that develop important skills.	18%	41%	17%	7%	17%
I am aware of the range of CTE programs offered throughout MCPS including those offered at Thomas Edison School of Technology.	16%	30%	21%	12%	21%
Students need more information on the career preparation opportunities that are available throughout MCPS.	40%	39%	5%	3%	13%
My school counselor helps me understand the wide range of career opportunities that are available and valuable after high school.	15%	35%	24%	13%	13%
I use Naviance to understand the range of meaningful opportunities available after high school and set goals to reach those.	13%	28%	25%	15%	19%
I believe MCPS strongly encourages me to take classes at Montgomery College and other colleges as part of a CTE programs of study.	11%	28%	29%	12%	21%
I think that CTE is for students who don't plan to go to college.	7%	13%	27%	21%	32%
CTE in MCPS offers challenging, rigorous programs of study for all students that develop the academic knowledge and technical skills to prepare students for college and a career.	13%	34%	9%	4%	41%
I think the quality of instruction students receive in CTE classes is as strong as the quality they receive in core academic classes.	13%	30%	10%	4%	42%
I wish there were more CTE programs at my school in high-skill, high-demand fields such as healthcare, advanced manufacturing, and information technology.	24%	35%	8%	4%	28%
I would prefer to take CTE courses at my local high school rather than take them at the Thomas Edison School of Technology.	26%	30%	9%	5%	30%

More likely to enroll at Edison if:

- 19% - The school offered more advanced academic courses like AP.
- 28% - I could go there full time instead of taking only a few of my classes there.
- 27% - The school was located closer to me.
- 26% - No answer

MCPS Parents	Strong Agree	Agree	Disagree	Strong Disagree	Don't Know
My child must continue his/her 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.	77%	14%	2%	2%	4%
My child will have a wide range of professional opportunities with good salaries if he/she earns an associate degree or an industry certification (that tells employers he/she has the skills needed for a job) in an in-demand field.	31%	36%	17%	5%	11%
Students who enroll in Career and Technology Education (CTE) and complete a program of study in high school may also attend a 4-year college or university after high school graduation.	55%	27%	1%	2%	15%
I believe that schools should prepare students for a wide range of opportunities after high school that lead to successful careers, including apprenticeships and 2-year colleges as well as 4-year colleges.	75%	18%	1%	3%	3%
My child has meaningful opportunities in MCPS to participate in high-quality real-world work experiences like internships that develop important skills.	23%	31%	17%	6%	23%
I am aware of the range of CTE programs offered throughout MCPS, including those offered at Thomas Edison School of Technology.	15%	34%	23%	9%	18%
Parents need more information on the career preparation opportunities that are available throughout MCPS.	52%	34%	5%	3%	7%
My child's school counselor helps him/her understand the wide range of career opportunities that are available and valuable after completing high school.	12%	23%	21%	14%	29%
I believe MCPS strongly encourages my child to take classes at Montgomery College and other colleges as part of a CTE programs	10%	23%	21%	8%	38%
CTE in MCPS is for students who don't plan to go to college.	5%	13%	33%	16%	33%
CTE in MCPS offers challenging, rigorous programs of study for all students that develop the academic knowledge and technical skills to prepare students for college and a career.	16%	29%	6%	2%	48%
I think the quality of instruction MCPS students receive in CTE classes is as good as the quality they receive in core academic classes.	14%	22%	4%	2%	59%
I wish more CTE programs were offered at my child's school in high-skill, high-demand fields like healthcare, advanced manufacturing, and information technology.	42%	30%	7%	1%	20%
My child would prefer to take CTE courses at his/her local high school rather than at the Thomas Edison School of Technology.	39%	24%	6%	2%	28%
My child would be more likely to enroll at Thomas Edison School of Technology if he/she could go there full time instead of taking only a few classes there.	11%	14%	25%	16%	34%
My child would be more likely to enroll at Thomas Edison School of Technology if it offered advanced academic courses like AP.	16%	23%	21%	13%	26%
My child would be more likely to enroll at Thomas Edison School of Technology if it were located closer to where we live.	24%	28%	15%	10%	23%
I think Thomas Edison School of Technology holds high expectations for student achievement.	15%	18%	2%	2%	62%

MCPS Teacher/Administrator	Strong Agree	Agree	Disagree	Strong Disagree	Don't Know
High school 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.	63%	27%	7%	2%	1%
Students who earn an associate degree or an industry certificate (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.	41%	49%	6%	1%	4%
Within the next several years, the U.S. economy will need nearly equal numbers of associate degree and bachelor's degree holders.	19%	32%	15%	2%	33%
MCPS 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.	82%	14%	1%	1%	1%
MCPS must prioritize increasing the number of students who earn industry certifications with labor market value much like they prioritize increasing the number of students who take and pass AP and IB exams.	63%	26%	3%	2%	5%
MCPS facilitates strong partnerships with a wide array of local businesses giving students access to internships and other real-world work experiences.	19%	36%	18%	4%	22%
Staff need more information on the career preparation opportunities that are available in MCPS.	54%	37%	4%	2%	3%
School counselors in MCPS help middle and high school students understand the wide range of career opportunities that are available and valuable after high school.	14%	27%	20%	11%	28%
Naviance is used effectively to help MCPS students understand the range of meaningful opportunities available after high school and set goals to reach those.	6%	19%	22%	10%	44%
I believe that work-based learning experiences in MCPS that range from career exploration to career training give all students – those going to a 4-year college as well as those going to a 2-year college, apprenticeships, or workplace - insight into the range of careers available to help them make informed choices about their long-term goals and plans.	43%	36%	10%	2%	10%
The quality of instruction students receive in CTE classes is as strong as the quality they receive in core academic classes.	25%	23%	9%	3%	40%
CTE is for students who don't plan to go to college.	3%	8%	39%	31%	19%
CTE in MCPS offers challenging, rigorous programs of study for all students that develop the academic knowledge and technical skills to prepare them for college and a career.	20%	34%	10%	2%	34%
CTE in MCPS enables students to develop sophisticated, specialized skills that will prepare them for robust and stable professional roles in a competitive, global economy.	22%	37%	7%	2%	32%
MCPS strongly encourages students to dually enroll at Montgomery College and other colleges as part of their CTE program of study.	8%	23%	17%	7%	45%
Thomas Edison School of Technology offers innovative, cutting edge technical programs of study for all students, including high-achieving students who plan to go to a 4-year college.	29%	31%	7%	3%	30%
New high-skill, high-demand CTE programs of study should be added to the offerings made available through Thomas Edison School of Technology, not to comprehensive high schools.	26%	17%	17%	15%	25%

MCPS Teacher/Administrator	Strong Agree	Agree	Disagree	Strong Disagree	Don't Know
As a high school STEM or CTE teacher in MCPS, 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.	48%	35%	7%	3%	8%
MCPS offers professional development opportunities and incentives that enable STEM and CTE teachers to earn industry certifications to strengthen their instructional practices in the high-skill, high-demand fields for which they prepare all students.	11%	26%	25%	16%	22%
As a STEM or CTE teacher in MCPS, 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 all students.	51%	28%	5%	6%	10%

Counselors	Strong Agree	Agree	Disagree	Strong Disagree	Don't Know
High school 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.	56%	27%	9%	3%	5%
Students who earn an associate degree or an 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%	45%	4%	0%	7%
Within the next several years, the U.S. economy will need nearly equal numbers of associate degree and bachelor's degree holders.	14%	37%	12%	0%	37%
MCPS 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.	81%	13%	2%	2%	3%
MCPS must prioritize increasing the number of students who earn industry certifications with labor market value much like they prioritize increasing the number of students who take and pass AP and IB exams.	62%	34%	3%	0%	2%
MCPS facilitates strong partnerships with a wide array of local businesses giving students access to internships and other real-world work experiences.	15%	42%	11%	4%	28%
Staff need more information on the career preparation opportunities that are available in MCPS.	48%	43%	6%	1%	2%
School counselors in MCPS help middle and high school students understand the wide range of career opportunities that are available and valuable after high school.	35%	54%	8%	2%	2%
Naviance is used effectively to help MCPS students understand the range of meaningful opportunities available after high school and set goals to reach those.	14%	44%	14%	8%	19%
I believe that work-based learning experiences in MCPS that range from career exploration to career training give all students – those going to a 4-year college as well as those going to a 2-year college, apprenticeships, or workplace - insight into the range of careers available to help them make informed choices about their long-term goals and plans.	46%	35%	12%	0%	8%

Counselors	Strong Agree	Agree	Disagree	Strong Disagree	Don't Know
The quality of instruction students receive in CTE classes is as strong as the quality they receive in core academic classes.	22%	26%	8%	2%	43%
CTE is for students who don't plan to go to college.	5%	5%	30%	38%	23%
CTE in MCPS offers challenging, rigorous programs of study for all students that develop the academic knowledge and technical skills to prepare them for college and a career.	24%	42%	4%	0%	31%
CTE in MCPS enables students to develop sophisticated, specialized skills that will prepare them for robust and stable professional roles in a competitive, global economy.	27%	39%	2%	1%	31%
MCPS strongly encourages students to dually enroll at Montgomery College and other colleges as part of their CTE program of study.	10%	32%	19%	4%	36%
Thomas Edison School of Technology offers innovative, cutting edge technical programs of study for all students, including high-achieving students who plan to go to a 4-year college.	44%	37%	5%	1%	13%
New high-skill, high-demand CTE programs of study should be added to the offerings made available through Thomas Edison School of Technology, not to comprehensive high schools.	24%	17%	30%	14%	15%
I fully understand the opportunities students have in high-skill, high-demand industries like healthcare, advanced manufacturing, and IT that do not require a 4-year degree and provide stable employment in professional roles that pay a family-sustaining wage.	21%	37%	32%	1%	8%
I believe I have the knowledge and preparation needed to help every student develop an individualized learning plan that includes specific career objectives, a related program of study, degree and/or industry certificate objectives, and specific strategies to reach employers.	19%	40%	30%	5%	7%

Business/Industry	Strong Agree	Agree	Disagree	Strong Disagree	Don't Know
There is broad participation of Montgomery County employers across key industries working in partnership with Montgomery County Public Schools (MCPS) on its career readiness programs.	18%	43%	23%	3%	15%
Employers in Montgomery County lead a process with MCPS that uses labor market data to determine which new career-technology education (CTE) programs are needed and which are no longer relevant to the growing regional economy.	15%	31%	21%	5%	28%
Employers in Montgomery County lead a process with MCPS to identify the academic knowledge, technical skills, and professional skills students need to be successful in high-skill, high-demand industries.	25%	25%	23%	5%	23%
Employers in Montgomery County are willing to offer high-quality work-based learning experiences for MCPS high school students that progress from career awareness and exploration (e.g. job shadowing) to preparation and training (e.g. internships).	38%	43%	10%	3%	8%
Employers in Montgomery County are willing to design high-quality work-based learning experiences that develop skills and competencies in students that are aligned with industry needs.	23%	55%	10%	5%	8%
Employers in Montgomery County see work-based learning experiences with MCPS students as an effective vehicle through which to grow and develop their own talent pipeline.	40%	33%	13%	5%	10%

Business/Industry	Strong Agree	Agree	Disagree	Strong Disagree	Don't Know
Employers in Montgomery County are willing to assess students' work-based learning performance and provide formal feedback to MCPS.	35%	50%	0%	3%	13%
In order to scale work-based learning experiences to all MCPS students, employers must have a single, reliable point of contact within MCPS that will coordinate and manage all related efforts.	33%	50%	5%	3%	10%
Legal restrictions on minors in certain workplace settings interfere with employers' interest in offering work-based learning experiences to MCPS students.	18%	48%	18%	3%	15%
The 2:30 p.m. dismissal time of MCPS high schools makes it difficult for employers in Montgomery County to offer work-based learning experiences.	23%	25%	23%	3%	28%
MCPS graduates who find gainful employment in Montgomery County after high school generally have the academic knowledge needed to be successful in entry-level positions in high-skill, high-demand fields such as those in healthcare, advanced manufacturing, and IT.	25%	23%	20%	0%	33%
MCPS graduates who find gainful employment in Montgomery County after high school generally have the technical skills needed to be successful in entry-level positions in high-skill, high-demand fields.	28%	20%	23%	3%	28%
MCPS graduates who find gainful employment in Montgomery County after high school generally have the professional skills (i.e. problem solving, communication, teamwork) needed to be successful in entry-level positions in high-skill, high-demand fields.	15%	33%	25%	0%	28%
Employers in MC use Industry-recognized credentials to recruit and hire qualified candidates.	25%	45%	8%	0%	23%
Employers in Montgomery County are willing to provide teacher externships that allow high school CTE and STEM teachers to spend extended time in a workplace to strengthen their knowledge and skills and establish concrete connections between classroom learning and its application.	5%	43%	8%	3%	43%
Employers in Montgomery County are willing to help MCPS secure public-private partnerships that help recruit industry professionals into classrooms as teachers to better prepare students for work in high-skill, high-demand fields like healthcare, advanced manufacturing, and IT.	25%	38%	5%	0%	33%

Appendix D: Focus Group Protocols

Staff

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.

Montgomery County Public Schools (MCPS) has hired Education Strategy Group (ESG) to conduct a review of the district's career preparation efforts, including career and technology education, also known as CTE. Our job is to collect information on the different career preparation 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 in providing candid, honest, straightforward responses to the questions that are posed.

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. [READ THE CONSENT FORM AND COLLECT SIGNED COPIES.]

This focus group will last about one hour. Do you have any questions before we begin?

Focus Group Questions:

First, I'd like to do a little level setting to better understand your professional position in MCPS for today's discussion.

1. Please raise your hand if you are:
    a. a CTE teacher
    b. a STEM teacher
    c. a teacher of an area other than STEM or CTE
    d. a counselor
    e. a school administrator

Next, I'd like to ask your opinion on postsecondary opportunities that are valuable and meaningful to students.

2. To what extent do 4-year colleges, community colleges, industry certifications, and apprenticeships each offer students an effective route to a career that pays a good wage and offers opportunities for advancement?

Next, I'd like to learn more about what you know and think about efforts in MCPS to prepare students for college and career, including Career and Technology Education – or CTE.

3. MCPS has done an exceptional job at emphasizing the need to prepare all kids for college after high school. As part of that effort, is there also a strong emphasis on the range of other postsecondary education and training options that will set students up for success, such as community colleges, apprenticeships, and industry certifications?
4. When you think of Career and Technology Education, or CTE:
    a. Do you think it prepares students for both college and career? Why or why not?

b. Is it 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 does it need to be improved?

5. In your experience, are high-achieving, academically-focused students drawn to CTE? Why or why not?
    a. What would make it more attractive to a wider range of students?
6. Should all students have real-world, hands-on opportunities with local businesses as part of their high school experience to prepare for their futures?
    a. Are they encouraged by MCPS and your school to do that whether they are going to 4-year college or taking another postsecondary route?
7. Does it help all students, regardless of their postsecondary plans, to earn credit toward college and/or an industry-recognized credential while they are in high school, like a certification from Cisco for students interested in Information Technology?
    a. Is earning an industry certification emphasized as being important in MCPS?
    b. Is earning college credit toward a degree while in high school emphasized as important?
8. Are you familiar with programs offered at the Thomas Edison High School of Technology?
    a. Are they highly sought after? Why or why not?
    b. What would make them more sought after?

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

9. As a teacher, counselor, or school administrator, do you feel you understand the range of postsecondary opportunities available to students – from 4-year college to community college to industry certifications and apprenticeships - that will lead them to professional jobs that pay a good salary and offer opportunities for advancement?
    a. To what extent does MCPS provide clear information about that full range of opportunities for students, from apprenticeships to industry certifications to 2- and 4-year degrees?
    b. To what extent does MCPS provide clear information about the substantial growth in meaningful jobs that will require some level of postsecondary education and training but not a full bachelor's degree?
10. What support would you need to increase your knowledge of the range of career programming available in MCPS?
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. Do you feel if would strengthen your instructional practice if you received more support in delivering blended academic and technical content?
12. As a counselor:
    a. To what extent do you feel adequately prepared to advise students on a wide range of specific career opportunities and related course taking?
    b. Have you been given clear information on which fields are high-skill, high-demand that lead to prosperous opportunities, and which are much more limited for students?

13. How might MCPS support students to help them understand the types of careers that are available, the courses they must take, and the degrees they must earn to find a job in the field of their choice?
14. Are there opportunities for MCPS to better expose students to career development outside of CTE? What might those be?

Finally, do you have any additional comments or suggestions you'd like to make before we close our discussion?

Thank you for your participation.

Parents

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

Montgomery County Public Schools (MCPS) 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 called CTE. This review is designed to collect information on the range of the district's career preparation efforts to identify specific ways in which those efforts can better serve students and their families.

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. [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 personally, so you should feel comfortable in providing candid, honest, straightforward responses to questions that are posed. Do you have any questions before we begin?

Focus Group Questions:

The first few questions focus on better understanding your opinions on the need for students to complete postsecondary education and training.

1. First, does your child's school provide a lot of helpful information on what your child might do after high school graduation to eventually have a career that offers a good living?
    a. Do they give information on 4-year college, community college, and other job training opportunities like apprenticeships? (define apprenticeship)
2. Raise your hand if you think children need to continue their education and training after high school in order to find jobs that pay well and offer opportunities to advance in a career.
3. To what extent do you think apprenticeships, 2-year colleges, and 4-year colleges each offer your child an effective route to a professional job that pays a good salary and offers opportunities to advance in a career? Why or why not?

Next, I'd like to learn more about what you know and think about Career and Technology Education – or CTE – in Montgomery County.

4. What do you think of when you hear the term "Career and Technology Education" – or CTE – in MCPS?
5. Do you have a child who is enrolled or was previously enrolled in CTE?
    a. Why did you choose to enroll your student in CTE?
    b. Has CTE focused on developing your student's academic, technical, and professional skills? If you do not have a child enrolled in a CTE program, what factors led to this decision?
6. Do you think CTE programs in MCPS are as high-quality as non-CTE programs? Why?

Next, I'll ask a few questions to better understand what you think students need to be effectively prepared for life after high school.

7. Is it important for all programs in MCPS - whether that's CTE, signature/academy programs, or a traditional academic course of study – to prepare all students to be successful in college? Why?
    a. Do you think all programs, including CTE, should prepare students for careers? Why?
8. As part of their MCPS high school experience, should all students have real-world, hands-on opportunities to prepare them for their futures?
9. Is it important to you that your child could earn credit toward in industry-recognized credential and/or a college degree while they are in high school, regardless of his/her post high school plans?
    a. To what extent are those kinds of opportunities widely available to MCPS students?

Next, I'd like to get clearer about the information you need from MCPS regarding career preparation opportunities.

10. Where do you and your child get information about the career preparation opportunities that are available in MPCS, including CTE?
    a. Do you get enough information?
    b. Is it the information you want and need?
11. Does MCPS provide compelling information to parents and students about the range of routes students can take to finding a good paying, stable careers including 4-year college, community college, and apprenticeships in high-skill, high-demand fields? Please explain.
    a. If not, what information would be helpful?
12. What kinds of supports would help MCPS students better understand the types of careers that are available as well as the courses they must take and the degrees they must earn in order to find a job in the field of their choice?

Finally, do you have any additional comments or suggestions you'd like to make regarding MCPS's career preparation efforts?

Thank you for your participation.

Students

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.

Montgomery County Public Schools (MCPS) has hired my firm, Education Strategy Group (ESG), to review of the district's career preparation efforts, including career and technology education, also known as CTE. Our job is to collect information on the different career preparation efforts in the school system to identify ways those efforts can better serve you and your families.

Please know that the information you share in this focus group will kept confidential, so you should feel comfortable in providing candid, honest, straightforward responses to the questions that I ask.

Your parent or guardian has already agreed to let you take part in this focus group, but your participation is voluntary, meaning that you don't have to participate if you don't want to; you don't have to answer questions you do not want to answer; and you can stop participating at any time. Choosing not to participate in the focus group, or choosing not to answer certain questions will not affect your school performance or your ability to participate in any programs offered by MCPS.

This focus group will last about one hour. If you do not wish to participate, you may leave the group. Do you have any questions before we begin?

Focus Group Questions:

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

1. Raise your hand if you have a pretty clear idea of what you want to do after you graduate from high school.
2. Where do you get advice from to help you make those decisions about what you'll do after high school?
3. Do you think you can find a career that offers a good living if you complete a job training program like an apprenticeship, earn an industry certification that tells companies you have technical skills for a job, or earn a degree from a community college? Why or why not?
4. Do you receive helpful information from your school about the different routes you can take to find a career that offers a good living?
    a. In what ways does your school help you choose the courses you take based on what you want to do after high school?
    b. In what ways has your school helped you to learn about different careers you might be interested in?
5. In what ways do you get information about the career preparation opportunities that are available in your school and school system, like Career Technology Education or CTE?
6. What kind of support would help you better understand the types of careers that are available as well as the courses and degrees that are necessary to find a job in the field of your choice?

Next, I'd like to ask a few questions about career preparation work in MCPS, especially Career and Technology Education – or CTE.

7. What do you think when you hear the term “Career and Technology Education – or CTE”?
8. Have you taken a CTE course?
    a. Why did you decide to enroll in CTE?
    b. In what ways have the CTE courses provided a learning experience that is different from your other courses?
    c. Did you have to work as hard in your CTE course as in your core academic courses?
9. If you have not enrolled in CTE, why?
10. Has your school encouraged you to earn an industry certification or college course credit while you are in high school? To what extent do you have opportunities to do that?
11. Should all students have real-world, hands-on opportunities with local businesses as part of their high school experience to prepare them for their futures? Why?
    a. Have you been encouraged to participate in an internship or an experience with a local business during the school year or the summer? Please explain.

Next, I’ll ask a few questions about how to improve your school’s focus on preparing you for a career.

12. 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 appealing to you?
13. Would you be more interested in a CTE program if it were combined with honors and AP courses?
14. Would you be more interested in a CTE program if different programs of study were offered at your high school?
15. Do any of you take classes at the Thomas Edison High School of Technology (“Edison”)?
    a. Why have you chosen to take them there?
    b. If you have chosen not to take classes there, why?
    c. What would make it a more appealing option to enroll at Edison?

Finally, do you have any additional comments or suggestions you’d like to make?

Thank you for your participation.