
Task Force to Study Vocational and Technical Education Programs in Harford County

December 1, 2014

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December 1, 2014

The Honorable Martin J. O'Malley, Governor
State House
Annapolis, MD 21401

The Honorable Thomas V. Miller, Jr., President of the Senate
State House, H – 107
Annapolis, MD 21401

The Honorable Michael E. Busch, Speaker of the House
State House, H - 101
Annapolis, MD 21401

Re: The Task Force to Study Vocational and Technical Education Programs in Harford County
MSAR # 10196; HB 838/Ch. 429, 2014

Gentlemen:

Submitted herewith, in accordance with the above-referenced legislation and Section 2-1246, State Government Article, Md. Ann. Code, is the final report of the Task Force on Vocational and Technical Education Programs in Harford County. The Task Force met five times as a whole group, along with the Committee to Review Programs at Harford Technical High School, to discuss and review the tasks with which it was assigned, and in smaller subcommittees to draft the various sections of the report. These sections in turn were each reviewed and approved by the large group.

I would like to thank the members of the Task Force for their diligent participation and many contributions to the final product.

Sincerely,

Joseph A. Schmitz, Chair

Cc: Ms. Sarah Albert, Mandated Reports Specialist
Department of Legislative Services
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Report of the Task Force to Study Vocational and Technical Education Programs in Harford County

Final Report

The Task Force Legislation and Preliminary Note

The Task Force to Study Vocational and Technical Education in Harford County was created pursuant to House Bill 838/CH. 429, 2014, and charged with working in conjunction with the Harford County Public Schools Committee reviewing program offerings at Harford Technical High School to complete enumerated tasks, namely: (1) examine the current capacity of vocational and technical education programs at Harford Technical High School and programs at other high schools in Harford County; (2) evaluate how much additional capacity is necessary in vocational and technical programs in Harford County; (3) explore potential options to address the need for additional capacity in vocational and technical education programs in Harford County, including an option to establish a second vocational and technical high school in the county; (4) study the vocational and technical education programs at other vocational and technical high schools in the State; (5) evaluate whether the vocational and technical education programs offered in Harford County are current with the demands of the economy and relevant to current and potential future employers; (6) examine the transportation needs of students in vocational and technical education programs; and (7) make recommendations regarding (i) the additional capacity that is necessary in vocational and technical education programs in Harford County; (ii) options to address the additional capacity needs; (iii) the appropriate vocational and technical education programs necessary to remain current with the demands of the economy and relevant to current and potential future employers.

The Task Force Report is a product of our work to complete the charges assigned. In an effort to present the information so that the readability of the Report is enhanced, we have adjusted the order in which the various charged tasks are addressed herein, as compared to the order in which these are set forth in the legislation. The enumerated tasks are identified in the headings to the sections of the Report.

Introduction

Harford County has been recognized as a leader in Career and Technology Education in the State of Maryland, with comprehensive programs at Harford Technical High School, a magnet¹ school offering specialized Career and Technology Education programs and serving the entire county, and also in every community high school in Harford County. See Appendix 1 and

¹ Magnet programs in Harford County Public Schools are defined as high school programs with a specialized curriculum that are currently offered at one site and are available to eighth grade students who qualify through an application process. Magnet programs can be total-school or school-within-a-school programs for which transportation is provided. Student Education Planning Guide, Harford County Public Schools, 2014-15. Harford Technical High School is a total-school magnet, drawing its entire student body from across the county.

Appendix 2. Those programs formerly known as Vocational and Technical Education have been redesigned as Career and Technology Education programs pursuant to the Carl D. Perkins Career and Technical Education Improvement Act of 2006, 20 USC Sec. 2301. Career and Technology Education constitutes a forward looking category of educational programs which have been created to be more academically rigorous and relevant in response to workplace needs.

Career and Technology Education (CTE) provides high school and community college students an opportunity to pursue a sequential technical and academic program of study leading to advancement in a career field. High school CTE programs of study give students the opportunity to transition smoothly into work-based learning experiences during their senior year, as well as further education or postsecondary education and to earn college credit and/or industry credentials in a career field of interest.² See Appendix 3 describing these features as applicable to Harford County.

I. Task 1: Current Capacity of Career and Technology Programs in Harford County

A. Capacity at Harford Technical High School

Harford Technical High School operates at an approximate annual enrollment of 1,025 students, although it has a state rated capacity of 920 students.³ This enrollment beyond state rated capacity will continue indefinitely, as the school admits about 275 students annually, with approximately 255 of these enrolling and attending. Further, the number of students enrolled in a given technical area varies from year to year; it would be impossible to fill all technical areas to capacity in any year as that would lead to a graduating class size of 321 students, a number which could not be supported by the number of academic faculty, the number of academic classrooms, and the remainder of the school's facilities, such as the cafeteria. Appendix 4 and Appendix 5 indicate capacity, applications, and enrollment for each of the individual technical areas at Harford Technical High School. It is important to recognize that Harford Technical High School does not get sufficient applicants in every technical area in any given year. Thus, consideration of expanding capacity requires an in-depth analysis to pinpoint the areas in which demand for seats consistently exceeds capacity, as well as other factors such as current and future workforce demands.

B. CTE Programs at other Harford County High Schools

The CTE programs at the nine community high schools in Harford County are set forth in

² Maryland High School Career and Technology Education Programs of Study, Maryland State Department of Education, Fourth Edition, November 2012, p. 1.

³ The moratorium on residential development in Harford County based on school enrollment is provided for in Harford County Code, Ch. 267, Article XV, and triggered if enrollment at a community school is at 110% or projected to reach 110% of capacity within three years. The language of the Article has not been deemed applicable to Harford Technical High School since it is a total-school magnet without a zoned feeder system rather than a "high school which serves the site". See footnote 1 above.

Appendix 6. In school year 2013-14, 7,848 students participated in CTE programs. There were teachers engaged to teach up to six periods in CTE areas. (Some teachers have mixed schedules in which they teach some CTE classes and other classes outside of a CTE area based on school need.) Recommended class sizes vary from course to course, but in general, class sizes fall within a range of 15 to 25 students. Some schools have increased capacity to deliver CTE programs by combining sections of different courses for instruction by one teacher during a given class period. Taking these various factors into account, CTE capacity at the nine community high schools stands at approximately 10,500 seats per year.

C. Additional Factors to be Considered in Evaluating CTE Capacity

1. Facilities – Many CTE programs require specialized instructional areas containing equipment meeting industry standards, such as professional foods labs, research and development labs, and computer labs. Program capacity can be limited in any given building by the instructional space available in which to deliver CTE programs.
2. Specialized staffing – At Harford Technical High School, the non-competitiveness of early career teacher salaries as compared to those available in industry, and additional coursework required for certification⁴, can make it a challenge to recruit teachers for certain technical areas. Even at the community high schools, there has been difficulty in maintaining adequate staffing in the area of technology education.
3. Operating budget - Despite the maintenance of effort in funding per student provided by county government, the growth of school system obligations such as contributions for pensions and other employee benefits, transportation costs, etc., has over the past several years led to a reduction of teaching staff, as well as funding for materials of instruction and textbooks, and for specialized professional development. In addition, other factors such as declining opportunities for external grants in support of CTE programs, or cases in which grants support startup expenses, but then the cost of sustaining the program must be assumed by the school system, negatively impact system capacity to expand newer, highly demanded programs such as those developed by Project Lead the Way (PLTW).
4. Student enrollment – Although enrollment in HCPS is declining, CTE participation is increasing, as is the number of CTE programs. See Appendix 6. From 2009-2013, enrollment in CTE classes increased from 6,320 to 7,848. The per pupil expenditures in a CTE program of study exceed those of other programs, because of specialized, consumable materials and equipment needs.

⁴ Code of Maryland Regulations (COMAR) Section 13A.12.02.15

II. Task 2: Evaluation of Additional Capacity Needs

A. Harford Technical High School

Programs at Harford Technical High School in which the number of qualified applicants consistently exceeds the capacity of the program area by at least a 3:1 ratio include: 1) Sports Technician and Exercise Science; 2) Academy of Health Professions-Nursing; and, 3) Licensed Cosmetology. Over the past five years, for example, the application numbers and enrollment capacity for these programs are as follows:

<u>Program</u>	<u>Applications 2010-2014</u>	<u>Capacity/Year</u>
Sports Technician and Exercise Science:	61, 69, 99, 106, 83	18/year
Academy of Health Professions:	102, 87, 101, 101, 96	24/year
Licensed Cosmetology:	64, 69, 69, 70, 52	18/year

In addition, there are also many more qualified applicants than capacity in:

<u>Program</u>	<u>Applications 2010-2014</u>	<u>Capacity/Year</u>
Agribusiness and Animal Sciences:	68, 94, 82, 87, 79	24/year
Food Production and Management:	76, 57, 76, 64, 81	22/year
Computer-Aided Design and Drafting (CADD):	62, 71, 81, 60, 77	20/year

See Appendix 5.

In these three areas, however, excess demand is mitigated. In the first instance, Agribusiness and Animal Sciences classes are offered within the Agriculture program at North Harford High School, and in a strand of the Natural Resources and Agricultural Sciences Magnet at North Harford High School, which is open for application to all students in the county. In addition, there are now Professional Foods labs in five community high schools, and there are residential kitchens in the remaining schools which are used in the Food and Beverage Management CTE program. Finally, there are three advanced technology course offerings available at the nine community schools which provide instruction in the use of AutoCAD software.

B. Other High Schools in the County

With the exception of the Food and Beverage Management and Early Childhood Education programs offered in the community high schools, and the Project Lead the Way Bio-Medical Sciences program at Bel Air High School, all other approved CTE programs offered in the community high schools in Harford County have additional capacity. See Appendix 6.

III. Task 4: Programs Offered at other State Technical High Schools

Working with various statewide industry groups, the Maryland State Department of Education (MSDE) has identified ten (10) career clusters that represent core business functions across broad industry areas in Maryland.⁵ The Division of Career and College Readiness of MSDE has compiled data on CTE programs in central Maryland in chart form listing programs by career cluster area. See Appendix 7. The programs listed include CTE programs housed not only in technical high schools and centers, but also those programs presented in community schools. It should be noted that some CTE Programs of Study (POS) are offered in all of the districts used in the comparison, some in none, and some in select districts. Offerings can be tied to locally perceived employment opportunities and needs. As Appendix 7 shows, the opportunities to participate in CTE offerings in Harford County are comparable to, and in many instances exceed, those in neighboring counties.

IV. Task 5: Evaluation of Whether the CTE Programs Offered in Harford County are Current with the Demands of the Economy and Relevant to Current and Potential Future Employers

Harford County continues to follow MSDE's lead in implementing redesigned CTE Programs, as called for in the Perkins Act, cited above, and in response to local workforce development needs. Districts have the option of adopting approved state CTE programs, or developing CTE programs in response to local labor market demands. The latter must also be approved by the State. Harford County Public Schools currently offers 16 state CTE programs and 16 locally developed CTE programs. See Appendix 8. Consistent with MSDE and federal requirements, these programs have been designed with analysis of regional labor market needs, and input as appropriate from Citizen's Advisory and Program Advisory Committees. For example, the original program offerings at Harford Technical High School were developed in part in response to a report commissioned by Harford County Public Schools and prepared by Battelle Columbus Laboratories in 1973.⁶

While there are inherent risks in trying to predict future employment trends, e.g., changes in economic conditions, technological developments, etc., reports such as the Battelle report

⁵ Maryland High School Career and Technology Education Programs of Study, Maryland State Department of Education, Fourth Edition, November 2012, p. 1.

⁶ Members of this Task Force, the Task Force on Additive Manufacturing, and the HCPS Harford Technical High School Program Review Committee, have met with interested representatives of local employers and industry groups to identify industry specific skills and supporting soft skills needed by students who would hope to enter these fields. While HCPS will continue to embrace its mission of teaching students the soft skills expected in the work place, and hard skills which will prepare them for future education, certification, and employment, most of the positions described to us entailed skills which can only be gained through post-secondary education in STEM areas.

referenced above have continued to be generated⁷, and are used in an ongoing fashion, in conjunction with input from the Citizens' Advisory and Program Advisory Committees. While existing programs continue to serve the needs of students and local businesses (assuming that students continue, where necessary, to pursue any additional needed certifications), a review of these reports, as well as data from the Office of Economic Development for Harford County and the Maryland State Department of Labor, Licensing, and Regulation, have helped identify focal points for future regional workforce development efforts. These industry/occupational areas of focus include: Health Care; Engineering; Information Technology, Computer Networking, and Computer Science; Advanced Manufacturing and Assembly; Green Construction; Business and Entrepreneurism; Leisure and Hospitality; and Logistics. There are numerous academic programs in place designed to meet regional workforce demands in these areas; however, in order to make appropriate general recommendations regarding future programming, it makes sense to look at these high need areas in relation to the current levels of educational programming provided and to determine additional capacity needed. Again with reference to the programs below, consideration must be given not only to startup costs, which can frequently be defrayed in part by grants, but also to the costs of sustaining them, which are borne locally.

1. Health Care – As noted above, students interested in careers related to health care have several opportunities which they may be able to pursue in Harford County. Project Lead the Way - Biomedical Sciences programs are in place at Bel Air High School and Havre de Grace High School. The Bel Air program operates at capacity. The Havre de Grace program, entering its second year, has additional capacity available. This could be accessed by Havre de Grace students, or students from other feeder patterns who successfully apply for a boundary exception. The PLTW Biomedical Sciences programs were initiated with grant funds.

Harford Technical High School offers the Academy of Health Professions and Sports Technician and Exercise Science programs, which provide programming to prepare students for careers in registered and licensed practical nursing and physical and occupational therapy. As noted, these programs have more qualified applicants than program capacity annually, and program expansion would be desirable. For these programs, this would require not only additional teaching space and an-additional staffing at Harford Technical High School, it would necessitate finding the additional internship opportunities which students need to complete.

2. Engineering – Students interested in careers in engineering and engineering technology can pursue several avenues to advance in these areas. The Project Lead the Way

⁷ See, e.g., Labor Market Analysis of the Susquehanna Workforce Investment Area, Sage Policy Group, Inc., 2012, <http://apg-cssc.com/media/client/pdf/DEMOSTUDYFINAL.pdf>, hereinafter referred to as The Sage Report; and, APG Regional Workforce Analysis: Chesapeake Science and Security Corridor, AKRF, 2009, http://apg-cssc.com/media/client/pdf/WorkforceTrainingAssesment_Final-Rpt.pdf

(PLTW)⁸ Pre-Engineering program is in place at C. Milton Wright High School and Aberdeen High School. This provides an exposure to rigorous coursework designed to prepare students for either college level coursework in engineering, or entry level careers in these areas.

At Harford Technical High School, students can enter either the Computer-Aided Design and Drafting (CADD) or Computer-Aided Manufacturing and High Performance Manufacturing (CAM) programs. CADD provides a broad-base of experience in mechanical and architectural drafting so that students will realize the diversity of career opportunities in this field, which includes drafters, engineers, technical assistants, engineering aides, CADD designers, 3-D animators, and technical illustrators.⁹ CAM provides a broad base of experience in manufacturing and machining so that students can explore a wide range of career opportunities including machining, tool and die making, precision machining, metal forming, manufacturing, production, and industrial maintenance.¹⁰

Each community high school in Harford County provides an opportunity to participate in a General Engineering Pathway, which would include some combination of at least two of the three advanced technology courses (Technological Design, Advance Design Applications, and Advanced Technological Applications) and select math and science classes, to total at least four credits. While this does not constitute a CTE program, it does qualify as a career pathway for local graduation requirement purposes, and the completion of two advanced technology courses satisfies minimum completion requirements as an alternative to the completion of two world language courses for admission to the University of Maryland system. In addition, Technological Design and Advanced Design Applications provide students with instruction in and the opportunity to utilize CADD software to solve engineering problems, explore manufacturing options, and develop construction plans.

Given workforce demands for engineers and engineering technicians, and the popularity of PLTW courses in the schools where they are presently, expansion of the PLTW Pre-Engineering program into the remaining high schools which do not currently have PLTW Pre-Engineering or Biomedical Sciences, is a system goal. However, existing Pre-Engineering programs at Aberdeen and C. Milton Wright were initiated with grant funds. Their continuation, as well as the desired expansion of PLTW into the remaining community high schools, will require the commitment of financial resources to pay for staffing, professional development, and materials of instruction. In addition, community support resources needed include business and industry partners to serve on the PAC and to provide industry mentors.

⁸ The Project Lead the Way programs in Biomedical Science and in Pre-Engineering are examples of programs in which grants can be secured for starting the programs, but the cost of sustaining these rests upon the school system, a phenomenon noted above on p. 3.

⁹ Student Education Planning Guide, Harford County Public Schools, 2014-15, p. 106.

¹⁰ Student Education Planning Guide, Harford County Public Schools, 2014-15, p. 106.

3. Information Technology, Computer Networking, and Computer Science – Current opportunities for students to study in areas related to this array of careers include the Computer and Networking Technology Program, which is transitioning to Cybersecurity, at Harford Technical High School. This program prepares students for careers in informational technology fields such as computer network design and administration, hardware, software, and network installation, local and wide-area network administration, and systems engineering.

Based on workforce development reports such as the Sage Report,¹¹ the Harford County Public Schools Report on Monitoring Visit generated by the MSDE (Appendix 9), and interactions with numerous industry and governmental partners, there will continue to be many opportunities for students well-versed in the Computer Sciences and related fields. Therefore, the establishment of an IT Computer Science program meeting MSDE CTE Programs of Study requirements and operating as a magnet program to serve students admitted from across the county, is planned to be housed in the proposed new Havre de Grace Middle/High School.

4. Advanced Manufacturing and Assembly – There will be an expansion of occupational opportunity in the areas of Advanced Manufacturing and Assembly, and Additive Manufacturing. See, e.g., House Bill 1060, 2014, establishing the Northeastern Maryland Additive Manufacturing Innovation Authority (NMAMIA)¹². The discussion of programs referenced in number 2 above pertaining to CADD and CAM, PLTW Pre-Engineering, and the Advanced Technology Career Pathway apply to these occupational areas. Consideration should be given to implementation of the state program of study in Manufacturing Engineering Technologies or a locally developed program of study aligned with the standards outlined in the National Institute for Metalworking Skills (NIMS).
5. Green Construction – Harford Technical High School provides educational programming in construction trades which prepare students to complete industry certifications, including the International Residential Code (IRC). Houses built on site for Habitat for Humanity meet Leadership in Energy and Environmental Design (LEED) standards, a green building tool that addresses the entire building life cycle recognizing best in class building strategies.¹³ Applications for this program and program capacity are essentially balanced, suggesting that there is not a need for additional capacity at this time.
6. Business and Entrepreneurship – As in any area in which a vibrant economic environment is sought, people with skills in business and entrepreneurship will be in demand. Harford County provides a setting for technology growth and

¹¹ The Sage Report, noted above, p. 5.

¹² <http://mgaleg.maryland.gov/2014RS/bills/hb/hb1060E.pdf>

¹³ www.usgbc.org

entrepreneurism.¹⁴ Educational opportunities include the Business Management and Marketing CTE programs available in all of HCPS' community high schools, and the Academy of Finance program at Edgewood High School. Opportunities exist for transcribed credit through dual enrollment at Harford Community College for completing business coursework at North Harford High School, Bel Air High School, and Edgewood High School and passing college assessments. These foregoing programs present opportunities for students to learn about business planning and entrepreneurship, and additional capacity exists within these programs if student demand increases.

7. Leisure and Hospitality – Leisure and hospitality will continue to be an area of the economy presenting employment opportunity for HCPS graduates.¹⁵ Harford Technical High School's Food Preparation and Management Program helps students acquire the skills associated with food preparation, sanitation, and safety practices, service procedures, food and equipment identification, and management skills, to prepare students for entry into a variety of occupations including chef, pastry chef, hot and cold cook, food manager, caterer, server, and purchasing agent.¹⁶ In addition, the community high schools offer the Food and Beverage Management (ProStart) Program, which enables students to study and practice professional food preparation, international cuisines, food safety and sanitation, customer service relations, accounting, cost control, marketing and lodging management.¹⁷ Both programs also offer students the opportunity to earn ServSafe certification.

The presence of professional kitchens in newly built or renovated high schools including Aberdeen, Bel Air, Edgewood, North Harford, and Patterson Mill has been a benefit to the presentation of the Food and Beverage Management Program.

A renovation and expansion of kitchen and dining facilities at Harford Technical High School is desirable to serve additional students in an environment that more closely resembles those found in modern professional kitchen and restaurant settings, and which would meet American Culinary Federation (ACF) requirements.

8. Logistics – The field of logistics is multi-faceted and encompasses the supply chain from suppliers to end use customers with an eye toward managing production, purchasing, shipping, and inventory. In response to inquiries generated by the Harford County Career and Technology Education Citizens' Advisory Council and forwarded to the Maryland State Department of Education, Division of Career and College

¹⁴ <http://www.harfordbusiness.org/Download/227.pdf>

¹⁵ <http://www.harfordbusiness.org/Download/227.pdf>; The Sage Report, p. 21.

¹⁶ Maryland High School Career and Technology Education Programs of Study, Maryland State Department of Education, Fourth Edition, November 2012, p. 7.

¹⁷ Maryland High School Career and Technology Education Programs of Study, Maryland State Department of Education, Fourth Edition, November 2012, p. 7.

Readiness, MSDE has indicated that it is researching the viability of developing a high school program of study in logistics/distribution with postsecondary connections to Morgan State University and the Community College of Baltimore County. MSDE now anticipates that it will have a program available to pilot in school year 2016, and has indicated its desire to have HCPS pilot this CTE program. See Appendix 10.

It is important to remember that for any of these areas currently offered in some fashion in Harford County Public Schools, entry into the work force may require additional training or certification which cannot be gained at the high school level. See Appendix 3. Students have the opportunity in many programs to earn college credit at Harford Community College, and other area institutions of high learning. See Appendix 11, a list of Career and Technology Programs presented at Harford Community College. In addition, Harford Community College anticipates the development of both credit and non-credit bearing programs of study in traditional trades areas such as plumbing and electrical. While the development and implementation of these courses is probably several years from coming to fruition, if these courses have college credit associated with them, eligible high school students would be able to take them for reduced cost under the provisions of the Maryland Annotated Code, Education Article, 18-14A-01, et seq., the College Readiness and Completion Act of 2013.¹⁸

V. Tasks 3 and 6: Options for Increasing System Capacity to Deliver Career and Technology Education in Harford County, and Estimated Transportation Needs for Students and Costs Associated with Each Option

The task force identified several options for expanding CTE Opportunities for students in Harford County. These are set forth below in order of the least to greatest commitment of resources as perceived by the Task Force.

1. The most feasible, least expensive way of increasing student participation in CTE would be the development of a middle school counseling program which would highlight the CTE opportunities present in the students' community schools. This could highlight the opportunities the student would have in the CTE areas referenced above which are present in the community high schools. This awareness may persuade some students that there are offerings at their home schools which they would like to study, and they could start to direct their education plans accordingly.

This option does not involve any increase in student transportation needs.

¹⁸ The opening of a satellite campus of Towson University at Harford Community College will also expand the opportunities for Harford County students to transition smoothly from high school to a two-year college to a four-year college, if desired.

2. Harford Community College is currently planning to expand its offerings of courses in technical areas. At the time that such courses become available, eligible Harford County Public School students could be encouraged to enroll in technical area instruction at Harford Community College while still enrolled in high school. This could offer a very low cost solution for expanding CTE for Harford County Public Schools. If the courses are offered for credit, there would be some cost involved for Harford County Public Schools and Harford Community College in terms of the amount of student tuition which those organizations underwrite for the students pursuant to Maryland Annotated Code, Education Article, 18-14A-01, et seq., the College Readiness and Completion Act of 2013.¹⁹ There may also be some technical areas in which participation could be limited by a minimum age requirement for certification in that field.

Seniors who take classes while dually enrolled at Harford Community College must provide their own transportation. This could impact participation. As with several of the options discussed herein, the expansion of the local system of public transportation would enhance student opportunities to participate in these HCC programs.

3. The expansion of Project Lead the Way – Pre-engineering to the remaining community high schools would address both student interest and employer need. Additional resources would be needed to commit to teacher training and program maintenance and materials. However, by being based at community schools, PLTW expansion would not implicate additional transportation costs.
4. As noted above, a program in the high demand area of IT Computer Science meeting MSDE CTE requirements and operating as a magnet to serve students admitted from across the county is planned for the proposed Havre de Grace Middle High School. This would require additional transportation service to students using the depot stop model currently used for the magnets at Aberdeen, Edgewood, and North Harford High Schools. The approximate cost of providing transportation per year would be \$180,000 per year.
5. CTE opportunities could be expanded in Harford County by offering condensed versions of technical area courses in the summer. This would be a way to expand the use of resources at Harford Technical High School to serve additional students.

Concerns would include that students could not earn certifications and would just be gaining an exposure with a certified instructor in a tech area. This should trigger an examination of whether students could be motivated to give up summer vacation to participate in such a program, and whether the benefits to students would be sufficient to merit the costs. It is also unknown whether teachers would give up other summer employment or education opportunities to participate.

¹⁹ Last year, the cost to Harford County Public Schools for all students who participated in dual enrollment was \$19,028.

Costs to the system would depend on whether or not there would be a charge for tuition and transportation, if provided. Not charging for tuition would not seem practicable, in that the current fiscal environment has led to the reinstatement of tuition in the regular summer school program for credit recovery.

Assuming a 30 day summer session, the salary for an instructor at 5 instructional hours per day, and one hour of planning per day, would be in the approximate range of \$6,000 to \$9,000. There would be unknown costs for consumable materials of instruction and increased wear and tear on equipment.

Student transportation needs could be addressed by expanding local public transportation, as discussed under the previous option. Student transportation needs could also be met by Harford County Public Schools. If provided by the school system, transportation would cost about \$180,000 for a summer session. Another possibility would be to limit summer sessions to upperclassmen and have them agree to provide their own transportation, eliminating this cost.

6. A similar approach would be to offer a twilight program for students from other schools to participate in CTE programs at Harford Tech after the regular school day. Students from other schools could be transported to Harford Technical High School which would provide a “second shift” of instruction in technical areas for these students.

This would be another way to expand the use of resources at Harford Technical High School to serve additional students. Teachers from Harford Technical High School, already at the location, might be more inclined to teach additional classes for appropriate compensation under their negotiated agreement.

Concerns would include the consideration of whether students could earn sufficient time in the classes to qualify for certifications which might be earned by regular Harford Technical High School students. Student interest might also be hampered by the reality that students who came to Harford Technical High School for this second shift would be unable to participate in any after school activities or sports at their home schools. The second shift would need to be over in time to honor existing arrangements with Harford Community College which uses some tech areas for college classes in the evening. It is also possible that the General Assembly will consider delaying the start of the high school day. A delayed start to the high school day would place additional time pressure on classes to be completed in time for Harford Community College use.

Assuming that classes would not be held on early dismissal days, or during final exams, there would also be a cost for teacher compensation in each tech area in the approximate range of \$15,000 to \$20,000 depending on teacher seniority, and assuming 2.5 hours of instruction times 170 days a year, and .5 hour of planning time for each 2.5 hours of instructional time. As with the summer program, there would also be unknown costs for consumable materials of instruction and increased wear and tear on equipment. For example, automotive tool boxes cost \$5,000 apiece, and can be shared by two students.

If there were 20 students, the cost for these additional tools would be \$50,000. Additional student lockers, and tool storage units would be needed.

Student transportation needs would likely need to be addressed in order for this option to be viable. This could be addressed through the expansion of public transportation. If the school system were to provide transportation, assuming buses were to run two shifts to and from community consolidated stops, the cost would be about \$895,000 per year. If however, the first stop could run from the students' community schools on buses proceeding to pick up Harford Technical High School students at dismissal, the first run of the day could be reduced to about \$36,000 for eight buses, with the trip to the consolidated stops after dismissal remaining at \$448,000 for all thirty buses. This would necessitate students leaving their home schools after completing only three classes daily, and arriving at Harford Technical High School some time before they could engage in classes there and student supervision during this time would need to be a consideration.

7. Capacity could be expanded at Harford Technical High School for areas in which applications consistently exceed capacity, (see Task 2: Evaluation of Additional Capacity Needs, previously identified, p. 3) by annexing the John Archer School, the school building and property adjacent to Harford Technical High School, and re-purposing it. This option is predicated upon building a new special needs center to meet the needs of the John Archer School student population. The re-purposed building could house expanded programs in Sports Technician and Exercise Science, Academy of Health Professions – Nursing, and Licensed Cosmetology. Consideration should also be given to creating a modernized Food Production and Management facility with the state of the art professional kitchen equipment which one would see in a restaurant or other professional food preparation setting, and which is lacking in the current Harford Technical High School kitchen.

This would entail considerable capital fund commitment both for the new special needs facility, and to re-purpose the existing building. There would be ongoing costs on the operational side for additional instructors, both in technical areas and in academic areas to support a larger student body. By remaining on the same campus, however, growth could be targeted to the technical areas in which the most added capacity is needed, and from an operational standpoint, there would be minimal impact on the existing transportation system serving Harford Technical High School. Whether additional busing would be needed would depend on the growth in enrollment, and student transportation needs could be met without creating an entire parallel system of county-wide magnet transportation.

8. Career and technology education could be expanded by creating a second technical high school in a re-purposed existing high school building. This could reduce the cost compared to new construction, but prior experience in the county indicates many unexpected costs could surface.

As with the annexation of the John Archer School, repurposing any existing building would require substantial renovation to accommodate technical programs. Any building selected would require the reassignment of current students and programs to another building. Finally, duplicating technical education programs could result in inefficiencies. An example would be the creation of a second county-wide magnet transportation model to mirror that of Harford Technical High School. The cost of transporting students from across the county to the total-school magnet was over \$895,000 last year, which, of course, is an annual line item in the operating budget.

9. Likely the most expensive option for expanding CTE in Harford County would be to build a second Technical High School. This would entail a large capital commitment from local and state government to purchase land and to design and build the school, as well as increasing the annual operating budget. The cost of construction of a new technical high school has been estimated by our Construction Office at \$64,300,544, and does not include various related costs, such as land acquisition, design costs, running utilities service lines, etc., costs which would be borne by the county. See Appendix 12.

Again, this would require the creation of a second county-wide magnet transportation model similar to that of Harford Technical High School's at a comparable annual operating cost.

For both option 8 and 9, it would require careful study and input from stakeholder groups to select the technical offerings to ensure that there would be sufficient student interest in particular programs to populate a second technical high school, to avoid unnecessary duplication between the schools, and to prevent competition for students, and scarce resources such as qualified technical area teachers.

10. The introduction of an MSDE approved Program of Study in Logistics would create another opportunity for students to learn skills which are in high demand by employers in the area.²⁰ Since this information was only recently made available to the system (see Appendix 10) decisions have yet to be made about a school location at which this program would be placed, and how the implementation of the program might implicate transportation and other operating costs.

It is also vital to a healthy system of CTE that ongoing evaluation of programs takes place to phase out programs that have ceased to meet student needs and labor market demands.

²⁰ The Sage Report, noted above, p. 5.

VI. Task 7: Summary: Recommendations Regarding Additional Capacity Needs in CTE Programs, Options to Address Additional Capacity Needs, and Appropriate CTE Programs Needed to Remain Current with the Demands of the Economy and to Meet Current and Future Employer Needs

A review of the CTE programs in Harford County reveals that there is a wide variety of CTE opportunities for students to pursue, and space within many existing programs in the community high schools. It will be important to look for opportunities to continue to expand CTE programming because of the popularity of such programs with students, the capacity of CTE to contribute to students' college and career readiness, and the preparation of CTE students to meet the demands of the economy and the needs of current and future employers.

At the same time, it is important to recognize that CTE programming, particularly in traditional CTE areas, can be very expensive because of specialized instructors, teaching space and equipment that is needed for appropriate delivery of instruction. Moreover, some of the traditional CTE areas at Harford Technical High School, such as construction trades and welding, have application rates close to program capacity, so would not merit consideration for expansion to a second technical high school site.²¹ Therefore, it will be important not to duplicate programs for which there is not adequate demand among students, or which would damage current programming by creating unintended internal competition for resources.

In summary the Task Force makes the following recommendations:

- Place additional effort into making middle school students aware of the many options for elective study in CTE areas in the community schools.
- CTE capacity should continue to be added by expanding the Project Lead the Way – Pre-engineering program, which is very attractive to students and prepares them for further education high demand careers in engineering and engineering technology.
- The establishment of a magnet program in the area of IT Computer Science would provide a wonderful opportunity for students to build a highly marketable skill set, and help fill an area of great employer need.
- The implementation of a State–approved CTE program in logistics when made available by MSDE would provide students with skills which address the demands of the regional economy and current and future employer needs.

²¹ The plumbing program at Harford Technical High School was discontinued in School Year 2013-14, in part because of a consistently low rate of application and enrollment.

- Prepare students to take advantage of technical education opportunities as these become available at Harford Community College, by providing both information and prerequisite skills.

The foregoing recommendations take into account the reality of constraints on operational and capital budgets faced by Harford County Public Schools in recent years. Were additional funding available from State or county sources, it would be important, as noted above, to study and plan any expansion of CTE to avoid generating internal competition for scarce resources, increasing capacity in areas for which there is insufficient student demand, or creating unnecessary ongoing demands on the operational budget.

Accordingly, any expansion of programs at Harford Technical High School should be concentrated on those areas in which applications consistently outstrip program capacity, such as Sports Technology and Exercise Science, Academy of Health Professions, Licensed Cosmetology, and Food Production and Management. Because of the expense of county-wide magnet transportation, and the need to avoid inefficient duplication of effort, the best option for expanding programming in the areas of Harford Technical High School that are over capacity would be to acquire additional space by annexing the John Archer School site. Expansion of capacity could be accompanied by bringing certain instructional areas into line with current industry standards. An example of this might include the creation of a state of the art professional kitchen to house a Culinary Arts program in compliance with ACF requirements.

Along the same lines, options to create additional student opportunity at Harford Technical High School, such as summer or twilight sessions, or to create a large amount of additional CTE capacity, such as building a new technical high school or re-purposing an existing building to serve as a technical high school, must be seriously scrutinized so that it is clear that there will be an appropriate return on any such investment, in terms of students wishing to participate, and in not spawning unintended consequences, such as undermining the current success of Harford Technical High School.

Appendix 1

Harford County Career Completer Programs by Cluster Areas

	Alt Ed	AHS	BHS	CMW	EHS	FHS	HGHS	HTHS	JHS	NHHS	PMHS
1. Arts, Media, and Communication											
• Printing and Graphic Communications								X			
2. Business, Finance, and Information Technology											
• Academy of Finance					X						
• Accounting		X	X	X	X	X	X		X	X	X
• Administrative Services		X	X	X	X	X	X		X	X	X
• Business Management		X	X	X	X	X	X		X	X	X
• Cyber Security								X			
• Computer Programming		X		X		X				X	
• Marketing		X	X	X	X	X	X		X	X	X
3. Health and Human Services											
• Academy of Health Professions (Nursing Assistant)								X			
• Biomedical Sciences			X				X				
• Early Childhood Education		X	X	X	X	X	X		X	X	X
• Fire Protection and Safety Tech./Technician		X	X	X	X	X	X	X	X	X	✓
• Food and Beverage Management (ProStart)		X	X	X	X	X	X		X	X	X
• Food Production and Management								X			
• Health Occupations (Sports Technician and Exercise Science)								X			
• Homeland Security and Emergency Preparedness									X		
• Licensed Cosmetology								X			
• Teacher Academy of Maryland		X	X	X	X	✓	✓		✓	X	X
4. Science, Engineering, and Technology											
• Agriculture/Animal Science								X		X	
• Automotive Diagnostics and Systems Repair								X			
• Automotive Refinishing and Collision Repair								X			
• Brick and Block Masonry								X			
• Carpentry								X			
• Certified Welding								X			
• Computer-Aided Design and Drafting								X			
• Computer-Aided Machining and HPM								X			
• Computer and Networking Technology								X			
• Electricity								X			
• Heating, Air Conditioning and Refrigeration Technology								X			
• Horticulture/Floral Design								X		X	
• Natural Resources and Agricultural Sciences										X	
• Pre-Engineering		X		X							
5. Career Research and Development	X	X	X	X	X	X	X		X	X	X

- * Currently being developed for MSDE approval
- X Program is approved and being Implemented
- ✓ Future possibility

Appendix 2

CAREER AND TECHNOLOGY EDUCATION PROGRAMS
Harford County Public Schools

ACADEMY OF FINANCE

The National Academy Foundation Finance Program at Edgewood High School prepares students for successful careers in finance, accounting and other fields. NAF's structured curriculum provides students with a broad understanding of financial and economic concepts and provides a quality capstone work-based learning experience. (Value Added: College Credit at HCC, dual enrollment)

Required Courses:

AOF Accounting
Introduction to Finance
Economics, Banking and Credit
Securities, Insurance and International Finance

***ACADEMY OF HEALTH PROFESSIONS (Certified Nursing Assistant) HTHS**

The Academy of Health Professions (AHP) uses project and problem-based learning, clinical and internship experiences, and classroom and lab instruction to teach students about the field of healthcare. Students are introduced to healthcare knowledge and skills through two foundation courses with content and assessments developed by Stevenson University. Following the foundation courses, students apply what they are learning to real-life situations in the medical specialty course, Certified Nursing Assistant. This course is approved by the Maryland Board of Nursing. Students also participate in a supervised clinical experience and allied health internship. (Value Added: College Credit at HCC and Stevenson University, CNA/GNA certifications)

Required Courses:

Foundations of Medical and Health Science
Structure and Functions of the Human Body
Certified Nursing Assistant
Clinical Internship
Allied Health Internship

ACCOUNTING

The Accounting Program prepares students to work with an accounting system. Areas of focus include recording business transactions, including billing and payables, analyzing and preparing income, cash flow, balance sheet statements and financial reports. Successful students in the program will become skilled in automated accounting and use of the internet for financial and economic research and practice good business decision-making and critical thinking skills. Advanced topics such as tax accounting, investing and corporate accounting will be explored. (Value Added: College Credit at HCC, CLEP credit)

Required Courses:

Principles of Business Administration and Management
Financial Management with Software Applications
Accounting I
Accounting II

ADMINISTRATIVE SERVICES

The Administrative Services Program prepares students to provide administrative office functions in various business settings. A successful student will be a highly trained professional who will acquire the competencies for the expert level of the MOS certification. (Value Added: College Credit at HCC, MOS certification)

Required Courses:

Principles of Business Administration and Management
Financial Management with Software Applications
Applications of Technology II
Office Systems Management

***AGRIBUSINESS AND ANIMAL SCIENCE**

The Agribusiness and Animal Science Program at focuses on the foundations of agribusiness, production and companion animal care, and veterinary assistance. Agribusiness & Animal Science provides a broad base of experience in agriculture sales and service, as well as a variety of professionally related areas of study so that students will realize the diversity of this field. Occupational areas include veterinary assistance, agribusiness sales and service, and large and companion animal husbandry. Successful students in the program need to possess solid math, science and communication skills, demonstrate an appreciation of agriculture and animals, exhibit a strong desire for community service, and have the ability to work with others. (Value Added: College Credit at HCC and CCBC, Vet Assistant certification)

Required Courses:

Animal Science I
Animal Science II
Animal Science III

AGRICULTURE/ANIMAL SCIENCE

The Agriculture/Animal Science Program at North Harford High School focuses on contemporary agricultural science topics related to biotechnology, agro terrorism, biofuels, land use, legislation and alternative agricultural enterprise opportunities as well as more traditional agricultural production topics related to basic farm equipment and agribusiness management. (Value Added: College Credit at HCC)

Required Courses:

Agriculture I or Animal Science I
Agriculture II or Animal Science II
Agriculture III or Animal Science III

***AUTOMOTIVE DIAGNOSTICS AND SYSTEMS REPAIR**

The Automotive Diagnostics and Systems Repair Program provides a broad base of experience in automobile repair so that students will realize the diversity of this field. Occupational areas include automobile technician, exhaust and emissions technician, service writer and automotive manufacturing technician. Area businesses where students may find employment include automobile dealerships, repair shops, auto parts businesses, and numerous auto-related companies. Successful students in the program possess good reading and problem-solving skills, have good manipulative skills, and demonstrate the willingness to meet craftsmanship standards. (Value Added: College Credit at CCBC, ASE certifications)

Required Courses:

Introduction to Automotives
Automotive Diagnostics and Repair I
Automotive Diagnostics and Repair II

***AUTOMOTIVE REFINISHING AND COLLISION REPAIR**

The Automotive Refinishing and Collision Repair Program provides a broad base of experience in auto body repair so that students will realize the diversity of this field. Occupational areas include refinishing technician, metal technician, insurance appraiser, and other automotive related occupations. Successful students in the program possess the ability to be self-directed and motivated to meet craftsmanship standards, work cooperatively with others to complete tasks, have good problem solving skills, and are competent in basic math. (Value Added: ASE certifications)

Required Courses:

Introduction to Automotives
Automotive Refinishing and Collision Repair I
Automotive Refinishing and Collision Repair II

BIOMEDICAL SCIENCES

The Biomedical Sciences Program at Bel Air and Havre de Grace High Schools prepares students for careers in the biomedical sciences, including healthcare. Areas of focus will include: understanding how the human body is a system, designing and conducting well-controlled experiments, analyzing and effectively presenting data from experiments, building models of multiple biological macromolecules, and analyzing treatment options or medical interventions for different diseases. A successful student is prepared for employment and further education at two- and four- year college levels. (Value Added: College Credit at Stevenson University)

Required Courses:

Principles of the Biomedical Sciences

Human Body Systems
Medical Intervention
Biomedical Innovations

***BRICK AND BLOCK MASONRY**

The Brick and Block Masonry Program provides a broad base of experience in construction so that students will realize the diversity of this field. An ongoing partnership with Harford Habitat for Humanity allows students to participate in the construction of a Habitat home over the course of each school year; the construction culminates in the dedication of the home to the recipient family, a ceremony in which HTHS students actively participate. Successful students in the program possess the ability to work cooperatively with others to complete tasks, demonstrate good problem solving skills, have good math skills, possess good manipulative skills, and exhibit the willingness to meet craftsmanship standards. (Value Added: IRC certification, internships)

Required Courses:

Introduction to Construction
Brick and Block Masonry I
Brick and Block Masonry II

BUSINESS MANAGEMENT

The Business Management Program prepares students to develop and manage a business plan for a small business. Students will apply accounting, marketing, and management concepts to realistic business scenarios. All aspects of managing a business will be addressed in addition to the competencies learned in computer applications, business communications and financial management. (Value Added: College Credit at HCC, CLEP credit)

Required Courses:

Principles of Business Administration and Management
Financial Management with Software Applications
e-Business
Accounting I

CAREER RESEARCH AND DEVELOPMENT

Career Research and Development (CRD) prepares students with the academic, technical and workplace skills necessary to seek further education and employment in a career field of their interest upon graduating high school. The overarching goals of CRD are to help students to: become aware of personal characteristics, interests, aptitudes and skills; develop an awareness of and respect for the diversity of the world of work; understand the relationship between school performance and future employment choices; develop a positive attitude toward work; and formulate a process for evaluating employability skill development and future education/training options.

Required Courses:

Career Research and Development
Career Development, Preparation and Transition
Work-Based learning Experience

***CARPENTRY**

The Carpentry Program focuses on both residential and commercial construction with an emphasis on wood and metal framing, stair building, concrete framework, cabinetry, and millwork. Students will work on actual projects both on and off the school campus. An ongoing partnership with Harford Habitat for Humanity allows students to participate in the construction of a Habitat home over the course of each school year; the construction culminates in the dedication of the home to the recipient family, a ceremony in which HTHS students actively participate. Students also learn building techniques and materials that are in compliance with LEED Certification standards, as well as emerging technologies and materials classified as "green construction." Students are given the opportunity to experience studies in the International Residential Code (IRC) Certification. The carpentry program introduces students to the many opportunities available after graduation and prepares them to enter an apprenticeship and become successful journeymen. (Value Added: IRC certification)

Required Courses:

Introduction to Construction
Carpentry I
Carpentry II

***CERTIFIED WELDING**

The Certified Welding Program provides hands on training in oxyacetylene welding and cutting, shielded metal arc welding, gas metal arc welding, and gas tungsten arc welding. Safety, blueprint reading and basic fabrication is also covered. Students will weld with different types of materials. Students will work with steel, aluminum, and stainless steel, welding these different metals in the 4 main welding positions using different joint designs. Students will have the option to take different certification tests during the Junior and Senior years. These tests are conducted and inspected according to the applicable American Welding Society (AWS) code or standard. After completion of a satisfactory test the student will be issued an AWS certificate. (Value Added: College Credit at HCC, AWS certification)

Required Courses:

Introduction to Manufacturing
Certified Welding I
Certified Welding II

***COMPUTER-AIDED DESIGN AND DRAFTING**

The Computer-Aided Design and Drafting (CADD) Program provides a broad base of experience in mechanical and architectural drafting so that students will realize the diversity of this field. Occupational areas include drafters, engineers, technical assistants, engineering aides, CADD designers, 3-D animators, and technical illustrators. Successful students in the program possess the ability to work cooperatively with others to complete tasks, have superior spatial relations, aptitude, and good math and science ability. Students who successfully complete the program have skills that will allow them to achieve a good income within a few years of graduation, and they are well prepared for higher education if they so desire. (Value Added: College Credit at HCC)

Required Courses:

Introduction to Manufacturing
Computer-Aided Design and Drafting I
Computer-Aided Design and Drafting II

***COMPUTER-AIDED MACHINING AND HIGH PERFORMANCE MANUFACTURING**

The Computer-Aided Machining and High Performance Manufacturing (CAM/HPM) Program provides a broad base of experience in manufacturing and machining so that students will realize the diversity of this field. Occupational areas include machining, tool and die making, precision machining, metal forming, manufacturing, production work, and industrial maintenance. Successful students in the program possess excellent math skills in whole numbers, fractions, decimals (four places), basic algebra, geometry, and some trigonometry. Students also exhibit attention to detail, are precise and accurate, and have the ability to work and communicate well with others. Students may enter two- or four-year college programs seeking degrees in mechanical or industrial engineering. Graduates may also choose to enter four-or five year apprenticeship programs. (Value Added: College Credit at HCC)

Required Courses:

Introduction to Manufacturing
Computer-Aided Machining and High Performance Manufacturing I
Computer-Aided Machining and High Performance Manufacturing II

***COMPUTER AND NETWORKING TECHNOLOGY**

The Computer and Networking Technology Program provides in-depth exposure to computer hardware and operating systems, as well as to the "soft skills" related to customer interaction and service. It provides a foundation for those responsible for protecting network services, devices, traffic, and data. Additionally, the program provides the broad-based knowledge necessary to prepare students for further study in other specialized security fields. Students gain hands-on classroom and laboratory experience in working with current and emerging networking technology. The focus is on the functionality of hardware and software components and the use of best practices in maintenance and safety issues related to assembling and configuring a computer, installing operating systems and software, and troubleshooting hardware and software problems. Students work daily with networks, emphasizing important networking concepts based on the types of practical network environments students may encounter in small office and home office (SOHO) networking. Students investigate the current risks and threats to an organization's data, combined with a structured method of addressing safeguards for these critical electronic assets. The career-oriented approach to learning networking empowers students to enter employment or further their education and training in the computer-networking field. This program is transitioning to Cyber Security in fall, 2013. (Value Added: College Credit at HCC)

Required Courses:

Introduction to Manufacturing
Computer and Networking Technology I
Computer and Networking Technology II

COMPUTER PROGRAMMING

The Computer Programming Program prepares students for careers in programming, information systems management, and related computer technology fields. Areas of focus will include: the evolution of computer technology, the operation of data-entry devices, the use of the microcomputer operating system and structured programming with the microcomputer. Students will study and apply a variety of programming languages (Visual Basic, C++ and JAVA) to solve problems confronting contemporary organizations.

Required Courses:

Applications of Computer Technology I or Accounting I
Computer Programming I
Computer Programming II
Computer Programming III

***CYBER SECURITY**

The IT Networking Academy (Cisco Academy) is a nationally recognized program that prepares students for successful careers in information technology fields such as computer network design and administration, hardware, software and network installation, local and wide-area network (LAN/WAN) management and systems engineering. Particular emphasis is given to using decision-making and problem-solving techniques in the application of science, mathematics, communication and social studies concepts to solve networking problems. Harford County Public Schools is offering additional course offerings related to information assurance and cyber security in partnership with CyberWatch. (Value Added: College Credit with Cisco Academy Colleges, Cisco certification)

Required Courses:

IT Essentials
CCNA Discovery I: Networking for Home or Small Business
CCNA Discovery II: Working at a Small/Medium Business or ISP
CyberWatch 110: Ethics and the Information Age
CyberWatch 160: Security+

EARLY CHILDHOOD EDUCATION

The Early Childhood Education Program helps students acquire the skills to work in a career related to child care or early childhood education. Areas of focus include: identifying factors that foster or hinder child development from conception through age eight; developing activities and materials to be used in a child care program; applying child development theories and practices; and planning, teaching and performing administrative duties in the child development laboratory with three- and four-year old children. (Value Added: College Credit at HCC, MSDE 90 Clock Hour Certificate)

Required Courses:

Learning About Children
Working With Children I
Working With Children II
Independent and Family Living

***ELECTRICITY**

The Electricity Program provides a broad base of experience in construction electricity skills so that students will realize the diversity of this field. An ongoing partnership with Harford Habitat for Humanity allows students to participate in the construction of a Habitat home over the course of each school year; the construction culminates in the dedication of the home to the recipient family, a ceremony in which HTHS students actively participate. Successful students in the program possess the ability to work cooperatively with others to complete tasks, have good problem solving skills, demonstrate the ability to measure precisely, exhibit proficiency in algebra or above, possess good manipulative skills and the willingness to meet craftsmanship standards. Harford Technical High School has an agreement with the Associated Builders and Contractors, Inc. (ABC) and the Harford County Electrical Contractors Association for apprenticeship opportunities. (Value Added: College Credit at HCC, IRC certification, apprenticeships)

Required Courses:

Introduction to Construction
Electricity I
Electricity II

FIRE PROTECTION AND SAFETY TECHNICIAN

The Fire-Rescue-EMS Cadet program is a joint venture among the Harford County Public Schools, the Harford County Volunteer Fire and EMS Association, and the Maryland Fire and Rescue Institute of the University of Maryland at College Park. The program is administered by the Harford County Volunteer Fire and EMS Association. It is designed to provide knowledge of fire, rescue, emergency medical, and hazardous materials skills and techniques that can be used by individuals who have an interest in a career in the emergency services or who want to serve in a volunteer capacity. (Value Added: MFRI certification)

Required Courses:

Career Research and Development
Maryland Fire and Rescue Institute

***FLORAL DESIGN**

The Floral Design Program provides a broad base of experience in basic design principles used in many other forms of artistic expression so that students will realize the diversity of this field. Occupational areas include floral design, interior design, wedding consultant, and greenhouse production. Successful students in the program have an aptitude for design and enthusiasm for working with flowering plants, are willing to meet customer demands, and have good communication skills. Students who successfully complete the program have skills that will allow them to achieve a good income within a few years of graduation, and they are well prepared for higher education if they so desire. Students can continue their education at colleges and universities, and community colleges in related fields.

Required Courses:

Floral Design I
Floral Design II
Floral Design III

FOOD AND BEVERAGE MANAGEMENT (PROSTART)

The ProStart program introduces high school students to a wide variety of careers within the restaurant, foodservice and hospitality industry. Students will study and practice professional food preparation, preparation of international cuisines, food safety and sanitation, customer service relations, accounting, cost control, marketing and an introduction to aspects of lodging management as well as build strong culinary, business, management and workplace skills as a result of their participation in this program. The National Restaurant Association Educational Foundation (NRAEF) designed the program's industry driven curriculum. (Value added: College Credit at Stratford University, NRAEF certifications)

Required Courses:

Introduction to Food Preparation and Hospitality
Advanced Food Preparation and Hospitality
Food and Hospitality Management
Food and Hospitality Practicum

***FOOD PREPARATION AND MANAGEMENT**

The Food Preparation and Management Program helps students acquire the skills associated with food preparation, sanitation and safety practices, service procedures, food and equipment identification, and management skills. In the senior year, students may participate in a work-based learning experience. The Food Preparation & Management Program provides a broad base of experience in food service so that students will realize the diversity of this field. Successful students in the program possess the ability to work cooperatively with others to complete tasks, have basic math, reading and communication skills, and demonstrate a willingness to participate in all food service tasks. (Value Added: ServSafe Sanitation Management Certificates)

Required Courses:

Food Preparation and Management I
Food Preparation and Management II
Food Preparation and Management III

***HEATING, AIR CONDITIONING AND REFRIGERATION TECHNOLOGY**

The Heating, Air Conditioning and Refrigeration Technology (HVAC) Program prepares students to apply technical knowledge and skills in order to install, service and repair various types of residential and commercial heating, cooling and refrigeration systems. All students have the opportunity to work efficiently in teams, learning to install, service, repair and trouble-shoot central air conditioning, heat pumps, oil furnaces, gas furnaces, and electrical heating systems. Students will learn safe use of hand tools, power tools and special tools related to the industry. They will use test instruments to measure airflow, read and interpret system pressures and test and trouble-shoot the electrical systems commonly found in the HVAC field. An ongoing partnership with Harford Habitat for Humanity allows students to participate in the construction of a Habitat home over the course of each school year; the construction culminates in the dedication of the home to the recipient family, a ceremony in which HTHS students actively participate. (Value Added: College Credit at HCC, IRC certification, apprenticeships)

Required Courses:

Introduction to Construction
Heating, Air Conditioning and Refrigeration Technology I
Heating, Air Conditioning and Refrigeration Technology II

HOMELAND SECURITY AND EMERGENCY PREPAREDNESS

The Homeland Security and Emergency Preparedness (HS/EP) Program at Joppatowne High School integrates government, academia, and private sector training/educational initiatives to help students understand how the United States and its interests worldwide are protected against threats to public safety, both natural and manmade, through effective communication, preparedness, detection, prevention, response and recovery. The program offers three career strands: Homeland Security Sciences, Criminal Justice/Law Enforcement, and Information/Communications Technology. These three strands align with the six mission areas of the United States Department of Homeland Security: Intelligence and Warning, Protection of Critical Infrastructure and Key Assets, Border and Transportation Security, Domestic Counterterrorism, Defense against Catastrophic Threats, and Emergency Preparedness and Response. (Value Added: College Credit at CCBC and HCC, STARS certification)

Required Courses:

Foundations of Homeland Security and Emergency Preparedness
Homeland Security Science I OR Administration of Justice I OR STARS Courses I and II
Homeland Security Science II OR Administration of Justice II OR STARS Courses III and IV
HSEP Internship/Capstone Experience

HORTICULTURE/FLORAL DESIGN

The Horticulture/Floral Design Program at North Harford High School focuses on basic plant science principles, greenhouse production, nursery crops, landscape design, Integrated Pest Management, floral design and retail sales. Students will apply their knowledge and skills gained in the classroom to greenhouse production and the school-based retail shop.

Required Courses:

Horticulture I or Floral Design I
Horticulture II or Floral Design II
Horticulture III

***LANDSCAPE ARCHITECTURE AND MANAGEMENT**

The Landscape Architecture and Management Program has been updated to reflect the changing dynamics of Harford County and by incorporating computer-aided design and drafting, as well as computer imaging programs, into its curriculum. Students learn through actual design, installation, and maintenance projects at school and in the community. As part of the overall program, students learn the operation and care of a skid loader, front-end loader, backhoe, forklift and other smaller machinery used in landscaping and athletic fields. Successful students in the program should enjoy working outdoors, have good communication skills, demonstrate an aptitude for design, and be self-directed and motivated.

Required Courses:

Horticulture I
Horticulture II
Horticulture III

***LICENSED COSMETOLOGY**

The Licensed Cosmetology Program prepares students to apply their knowledge and skills in all phases of cosmetology. Everything from finger waving to hair-color application is taught to the students in the practical portion of the program. In the theoretical part of the program, students are taught the fundamentals of hair and its properties, skin care, chemical services, nail care, sterilization and decontamination. Most importantly, the students are offered a well-rounded People Skills Program, as communication with other individuals is of the utmost importance. Upon completion of the program, students who have accumulated a minimum of 1500 actual hours in the course, and who have successfully passed both their practical and theoretical work with a 75% average or better, become eligible to take the State Board Exam in Baltimore. Successful candidates become licensed in the State of Maryland to work at any full-service salon in Maryland. (Value Added: State Board certification)

Required Courses:

Licensed Cosmetology I
Licensed Cosmetology II
Licensed Cosmetology III

MARKETING

The Marketing Program prepares students to develop marketing plans by analyzing customer needs and the market environment. Areas of focus will include: advertising and promotion planning, distributing products, and conducting market research. Managerial skills will be promoted in many cases through the operation of a school store. Work-based learning is a significant component of this program. (Value added: College Credit at HCC, CLEP credit)

Required Courses:

Principles of Business Administration and Management
Financial Management with Software Applications
Marketing I
Marketing II

NATURAL RESOURCES AND AGRICULTURAL SCIENCES

The Natural Resources and Agricultural Sciences (NRAS) Program at North Harford High School provides students with the opportunity to experience challenging science and technology coursework with an emphasis on career development and real world application. The program is composed of three strands focusing on Animal/Equine Science, Plant Science, or Natural Resources Science. The Harford County Agricultural Economic Advisory Board, the University of Maryland, Harford Community College and Harford County Public Schools have partnered to develop a program wherein each strand will provide students with the background knowledge and skills necessary to prepare them for the next steps toward college and careers. In their senior year, students will take part in a capstone project, either in a work-based environment, a school-based practical learning activity, or an off-site research facility with a mentor. The senior capstone project is based on student interests and future goals.

Required Courses:

Foundations of Natural Resources and Agricultural Sciences
Comparative Anatomy and Physiology of Farm Animals OR Plant Propagation and Production OR Wildlife Management and Sciences
Animal Management Sciences OR Edible, Environmental and Ornamental Plants OR Wetlands and Aquatics
Research in Natural Resources and Agricultural Sciences

PRE-ENGINEERING

Project Lead The Way (PLTW) Program at Aberdeen and C. Milton Wright High Schools incorporates the national standards of The National Council of Teachers of Mathematics, the National Science Standards and the International Technology Education Association. The program prepares students for further education and careers in engineering and engineering technology. Students complete three foundation courses and one specialized course before applying the engineering process to design and develop an original solution to a valid open-ended technical problem in the capstone course. (Value Added: College Credit at UMBC)

Required Courses:

Introduction to Engineering Design
Principles of Engineering
Digital Electronics

Aerospace Engineering OR Biotechnical Engineering OR Civil Engineering and Architecture
Engineering Design and Development

***PRINTING AND GRAPHIC COMMUNICATIONS**

The Printing and Graphic Communications Program provides students with an overview of the offset printing/ graphics industry and prepares them for PrintED® Certification in Introduction to Graphic Communications and Digital File Preparation. Students will explore the scope and relevance of the printing/graphics industry, demonstrate knowledge of the print production process, demonstrate knowledge of digital imaging and digital workflow, learn appropriate uses of Adobe CS4 software titles – InDesign, Photoshop and Illustrator, use industry related math and vocabulary, and produce a variety of small-format printed materials.

Required Courses:

Printing and Graphic Communications I
Printing and Graphic Communications II
Printing and Graphic Communications III

***SPORTS TECHNICIAN AND EXERCISE SCIENCE (Health Occupations)**

The Sports Technician and Exercise Science Program focuses on various aspects of sports medicine and exercise science, including the components of wellness, fitness assessment, and proper design of customized conditioning programs. Students also learn and demonstrate the skills necessary to work as aides in rehabilitation or sports medicine. In the senior year, students may experience a variety of internships and career experiences where they must apply academic and practical knowledge in the clinical setting; placement is based on interest, classroom performance and career goals, and may include such settings as: area athletic clubs, sports medicine treatment centers, chiropractic practices, rehabilitation centers, orthopedic offices, nutritionist's office, occupational therapy centers, student athletic training with teams, or the HTHS weight room. (Value Added: College Credit at HCC, Personal Trainer or Group Fitness Instructor certification (must be 18 years of age).

Required Courses:

Health Occupations I
Health Occupations II
Health Occupations III

TEACHER ACADEMY OF MARYLAND

The Teacher Academy of Maryland Program aligns with the Interstate Teacher Assessment and Support Consortium (InTASC) and the Maryland Essential Dimensions of Teaching (EdoTs). This program is based on the outcomes of the Maryland Associate of Arts in Teaching (A.A.T.) degree, which aligns with the National Council for the Accreditation for Teacher Education (NCATE) standards and prepares students for further education and careers in the education profession. The program consists of four high school credits that focus on teaching as a profession, human growth and development, learning theory, and curriculum and instruction. These credits are designed to articulate to a Maryland post secondary teacher education program. (Value Added: College Credit at HCC, Towson University, Stevenson University, Coppin State University; ParaPro certification)

Required Courses:

Human Growth and Development through Adolescence
Teaching as a Profession
Foundations of Curriculum and Development
TAM Internship

***Denotes CTE programs offered only at Harford Technical High School**

Appendix 3

**Career and Technology Education
List A Programs 2014-15**

Revised 10/16/14

CIP	Program	College Credit	Technical Assessment
0103014	Agricultural Production (Agriculture/Animal Science)	Yes	Yes
0106014	Horticulture (Horticulture/Floral Design)		
0199990	Natural Resources and Agricultural Sciences	Yes	Yes
1003500	Printing Technologies (Printing and Graphic Communication)	Yes	Yes
1109500	Cyber Security	Yes	Yes
1204500	Careers in Cosmetology (Licensed Cosmetology)		Yes
1301500	Academy for Teacher Education (Teacher Academy of Maryland)	Yes	Yes
155000	Pre-Engineering	Yes	
2002014	Early Childhood Education	Yes	Yes
2004014	Institutional Food Workers and Administrators (Food Preparation and Management)		Yes
4302014	Fire Protection and Safety Tech/Technician	Yes	Yes
4303500	Homeland Security and Emergency Preparedness	Yes	Yes
4601014	Brick, Block and Stone Masonry (Brick and Block Masonry)		Yes
4602014	Carpentry		Yes
4603024	Electrician (Electricity)	Yes	Yes
4701054	Industrial Electronics (Computer and Networking Technology)	Yes	
4702014	Heating, Air Conditioning and Refrigeration Technology		Yes
4706034	Automotive Body Repair (Automotive Refinishing and Collision Repair)		Yes
4706450	NATEF/ASE Automotive Technician (Auto Diagnostics and Systems Repair)	Yes	Yes
4801014	Drafting (Computer-Aided Design and Drafting)	Yes	
4805034	Machine Tool Operation (Computer-Aided Machining/High Performance Manufacturing)	Yes	
4805084	Welding, Brazing and Soldering (Certified Welding)	Yes	Yes
5111500	Biomedical Sciences	Yes	
5199991	Health Occupations; Sports Technician and Exercise Science	Yes	
5100500	Academy of Health Professions: Nursing	Yes	Yes
5202510	Business Management	Yes	Yes
5203540	Accounting/Finance (Accounting)	Yes	Yes
5204510	Administrative Services	Yes	Yes
5208504	NAF Academy of Finance	Yes	
5209550	Food and Beverage Management(ProStart)	Yes	Yes
5212014	Business Data Processing and Related Programs (Computer Programming)		
5214510	Marketing	Yes	Yes
8600000	Career Research and Development		

Appendix 4

**Harford County Public Schools – Harford Technical (HTHS) - Enrollment
2013-14**

Overall Capacity MSDE/HCPS	920 Students
HTHS Current Enrollment	1020 Students
Number of Students admitted annually*	275 students
Combined capacity of all HTHS programs per year +	321 students
Estimated number of graduates per year	240 students
English Language Learners (ELL) students annual estimate	20 students

*Note: Every student admitted does not attend Harford Technical High School, some ultimately may choose to remain in a community school.

+ Note: As stated in the body of the report, all programs cannot be enrolled to a capacity, as the academic program and school facilities could not support this population (4 x 310 = 1240)

Appendix 5

Harford County Public Schools – Harford Technical (HTHS)

Application / Enrollment Data 2014 – 2018

Program of Study	Maximum Capacity	2018 Apps.	2018 Enroll.	2017 Apps.	2017 Enroll.	2016 Apps.	2016 Enroll.	2015 Apps.	2015 Enroll.	2014 Apps.	2014 Enroll.
Academy of Health Professions	24	96	24	101	22	101	24	87	24	102	24
Automotive Diagnostic & Systems Repair	18	37	16	46	15	31	17	36	17	37	17
Agribusiness & Animal Science	24	68	15	94	16	82	16	87	24	79	24
Automotive Refinishing & Collision Repair	18	9	8	14	10	9	8	7	6	16	11
Computer-Aided Design & Drafting	20	62	19	71	19	81	18	60	20	77	20

Program of Study	Maximum Capacity	2018 Apps.	2018 Enroll.	2017 Apps.	2017 Enroll.	2016 Apps.	2016 Enroll.	2015 Apps.	2015 Enroll.	2014 Apps.	2014 Enroll
Construction Trades (includes Carpentry, Electricity, HVAC & Brick and Block Masonry)	65	66	55	54	45	80	54	58	53	64	56
Cosmetology – Licensed	18	52	17	70	18	69	18	69	17	64	16
Computer & Networking Technology (Cyber Security)	22	44	20	72	18	79	17	53	20	51	22
Floral Design	18	22	15	17	13	30	17	18	17	30	21
Food Preparation & Management	22	76	18	57	17	76	18	64	17	81	18
Landscape Architecture & Management	12	26	6	6	6	13	8	3	3	10	7
Printing & Graphic Communications	18	39	15	25	15	35	18	36	16	44	15

Program of Study	Maximum Capacity	2018 Apps.	2018 Enroll.	2017 Apps.	2017 Enroll.	2016 Apps.	2016 Enroll.	2015 Apps.	2015 Enroll.	2014 Apps.	2014 Enroll
Sports Technician & Exercise Science	18	83	16	106	17	99	16	69	17	61	16
Welding – Certified	12	13	10	16	12	12	9	13	10	12	8
Computer-Aided Machining and High Performance Manufacturing	12	33	11	16	10	18	10	12	12	24	12
TOTALS	321	726	265	765	253	815	268	672	273	752	287

Appendix 6

Harford County Public Schools – Business Management- CTE Enrollment

2013-14

School	Sections	Seat Range 20-30 total	Seats Used
ABHS	12	240-360	222
BAHS	6	120-180	89
CMWHS	8	160-240	118
EDHS	14	280-420	187
FAHS	8	160-240	168
HDGHS	4	80-120	55
JTHS	4	80-120	57
NHHS	12	240-360	184
PMHS	9	180-270	111
TOTAL	72	1440-2160	1191

Harford County Public Schools – Finance and Accounting- CTE Enrollment

2013-14

School	Sections	Seat Range 20-30 total	Seats Used
ABHS	14	280-420	147
BAHS	7	140-210	116
CMWHS	2	40-60	32
EDHS	12	240-360	187
FAHS	3	60-90	69
HDGHS	1	20-30	11
JTHS	1	20-30	15
NHHS	3	60-90	66
PMHS	3	60-90	46
TOTAL	45	900-1350	564

Harford County Public Schools – Business Data Processing- CTE Enrollment

2013-14

School	Sections	Seat Range 20-30 total	Seats Used
ABHS	5	100-150	62
CMWHS	4	80-120	73
FAHS	8	160-240	147
NHHS	10	120-130	125
TOTAL	27	540-810	407

Harford County Public Schools – Marketing- CTE Enrollment

2013-14

School	Sections	Seat Range 20-30 total	Seats Used
BAHS	6	120-180	87
CMWHS	9	180-270	140
FAHS	6	120-180	85
HDGHS	1	20-30	3
JTHS	1	20-30	4
NHHS	4	80-120	119
PMHS	2	40-60	20
TOTAL	29	580-870	458

Harford County Public Schools – Career Research & Development- CTE Enrollment

2013-14

School	Sections	Seat Range 20-30 total	Seats Used
ABHS	3	60-90	59
AEP	1	20-30	6
BAHS	3	60-90	87
CMWHS	1	20-30	18
EDHS	2	40-60	55
HDGHS	3	60-90	54
JTHS	4	80-120	42
NHHS	4	80-120	73
PMHS	4	80-120	31
TOTAL	25	500-750	401

Harford County Public Schools- PLTW (Bio- Medical Science) CTE Enrollment

2013-14

School	Sections	Seat Range 20-30 total	Seats Used
BAHS	11	220-330	247
HDGHS	1	20-30	17
TOTAL	13	260-390	261

Harford County Public Schools – Early Childhood Education- CTE Enrollment

2013-14

School	Sections	Seat Range 15-20 total	Seats Used
ABHS	8	120-160	220
BAHS	10	150-200	213
CMWHS	9	135-180	149
EDHS	11	165-220	184
FAHS	7	105-140	122
HDGHS	5	75-100	80
JTHS	6	90-120	87
NHHS	9	135-180	168
PMHS	6	80-120	126
TOTAL	71	1065-1775	1349

Harford County Public Schools – ProStart- CTE Enrollment

2013-14

School	Sections	Seat Range 15-20 total	Seats Used
ABHS	11	165-220	217
BAHS	6	90-120	121
CMWHS	13	195-260	235
EDHS	10	150-200	194
FAHS	4	60-80	82
HDGHS	7	105-140	131
JTHS	6	90-120	103
NHHS	13	195-260	284
PMHS	6	90-120	119
TOTAL	76	1140-1900	1486

Harford County Public Schools – PLTW (Pre-Engineering) CTE Enrollment

2013-14

School	Sections	Seat Range 20-30 total	Seats Used
ABHS	8	160-240	100
CMWHS	8	160-240	128
TOTAL	16	320-480	228

**Harford County Public Schools – Teacher Academy of MD (TAM) - CTE
Enrollment**

2013-14

School	Sections	Seat Range 15-20 total	Seats Used
ABHS	4	60-80	24
BAHS	2	30-40	41
CMWHS	2	30-40	20
EDHS	3	45-60	39
NHHS	3	45-60	36
PMHS	4	60-80	10
TOTAL	18	270-450	170

Harford County Public Schools – PLTW (Pre-Engineering) CTE Enrollment

2013-14

School	Sections	Seat Range 20-30 total	Seats Used
ABHS	8	160-240	100
CMWHS	8	160-240	128
TOTAL	16	320-480	228

Harford County Public Schools- Agricultural Production- CTE Enrollment 2013-14

School	Sections	Seat Range 20-30 total	Seats Used
NHHS	12	240-360	152
TOTAL	12	240-360	152

Harford County Public Schools- Horticulture- CTE Enrollment 2013-14

School	Sections	Seat Range 20-30 total	Seats Used
NHHS	2	40-60	39
TOTAL	2	40-60	39

Harford County Public Schools- Agricultural Business and Production (NRAS Magnet) - CTE Enrollment 2013-14

School	Sections	Seat Range 20-30 total	Seats Used
NHHS	14	280-420	175
TOTAL	14	280-420	175

Harford County Public Schools- Academy of Finance (AOF) - CTE Enrollment 2013-14

School	Sections	Seat Range 20-30 total	Seats Used
EHS	4	80-120	59
TOTAL	4	80-120	59

Harford County Public Schools- Homeland Security and Emergency Preparedness- CTE Enrollment 2013-14

School	Sections	Seat Range 20-30 total	Seats Used
JTHS	13	260-390	147
TOTAL	13	260-390	147

Harford County Public Schools Technology Enrollment 2013-14

School	Sections	Seat Range 20-30 total	Seats Used
ABHS	27	540-810	635
BAHS	31	620-930	884
CMWHS	20	400-600	647
EDHS	26	520-780	1037
FAHS	24	48-720	614
HDGHS	17	340-510	307
JTHS	15	300-450	557
NHHS	17	340-510	454
PMHS	12	240-360	291
TOTAL	189	3780-5670	5426

Appendix 7

**Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City**

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Arts, Media & Communication	<p>Printing Technologies (PrintED) – In partnership with the <i>Printing and Graphics Association MidAtlantic (PGAMA)</i>, Print ED is designed to give students an overall understanding of the industry while teaching the academic and technical skills needed to be successful in this field. Three industry certifications are available for students.</p>	Harford Technical	N/A	<p>High Schools: -Edmondson-Westside -Patterson</p> <p>-Carver Vocational-Technical (Carver Tech) -Mergenthaler Vocational Technical (Mervo Tech)</p>	<p>High Schools: -Overlea HS -Kenwood HS</p> <p>-Sollers Point Tech. -Western School Of Technology</p>	Carroll County Career & Technology Center	N/A	-Applications & Research Laboratory
	<p>Interactive Media Production (IMP) - This program of study includes a strong foundation in arts and communication with emphasis on graphic and media communications, interactive technologies and project development. One option includes Simulation and Gaming. Students may earn an industry recognized credential in Adobe Creative Suite and World Organization of Webmasters.</p>	N/A	<p>High Schools: Severna Park Chesapeake Old Mill South River</p> <p>Center of Applied Technology – South (CAT-S)</p>	<p>High Schools: -Augusta Fells Savage -Baltimore Talent Development -Digital Harbor -Edmondson-Westside -Frederick Douglas -Friendship Academy -Northwestern</p>	<p>High Schools: -Catonsville -Pikesville -Franklin -Parkville -Chesapeake</p> <p>-Carver Center for Arts & Technology -Eastern Tech</p>	N/A	N/A	N/A

Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Business Management & Finance	Business Management- This program of study prepares students for college-level programs in various areas of Business Administration. Students have an opportunity to take the CLEP exam for postsecondary credits in this area.	High Schools: In every high school (9) excluding Harford Technical	High Schools: In every high school but Southern	High Schools: -Edmondson-Westside -Forest Park -Heritage - National Academy Foundation -Patterson -Reginald F. Lewis -Carver Tech -Mervo Tech	High Schools: In every high school (25)	High Schools: -Francis Scott Key -Liberty -Century -Manchester Valley -Winters Mill -Westminster -North Carroll -South Carroll	N/A	High Schools: In every high school (12) excluding the Applications & Research Laboratory
	Finance and Accounting- Students learn fiscal management and basic accounting principles as well as decision making techniques and business communication skills. Students have an opportunity to take the CLEP exam for postsecondary credits in this area.	High Schools: In every high school (9) excluding Harford Technical	High Schools: North County Severna Park Chesapeake Arundel South River	High Schools: -Edmondson-Westside -Forest Park -Heritage - National Academy Foundation -Patterson -Reginald F. Lewis -Carver Tech -Mervo Tech	High Schools: In every high school (25)	High Schools: -Francis Scott Key -Liberty -Century -Manchester Valley -Winters Mill -Westminster -North Carroll -South Carroll	High Schools: In every high school (5) excluding the Cecil County School of Technology	High Schools: In every high school (12) excluding the Applications & Research Laboratory

**Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City**

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Business Management & Finance (continued)	Marketing-Students learn about global marketing, how to develop a marketing plan, and ethics. Students have an opportunity to take the CLEP exam for postsecondary credits in this area.	High Schools: In every high school (9) excluding Harford Technical	High Schools: North County Severna Park Chesapeake Meade Old Mill	High Schools: -Patterson -Reginald F. Lewis -Mervo Tech	High Schools: In every high school (24) excluding the Carver Center	High Schools: -Francis Scott Key -Liberty -Century -Manchester Valley -Winters Mill -Westminster -North Carroll -South Carroll	N/A	High Schools: In every high school (12) excluding the Applications & Research Laboratory
	Administrative Services- This provides students with knowledge on how to utilize technology in the analysis and communication of business principals. (Microsoft Office Specialist- MOS-certification)	High Schools: In every high school (9) excluding Harford Technical	High Schools: North County Meade Northeast Annapolis Southern	High Schools: -Edmondson- Westside -Heritage -Patterson -Reginald F. Lewis -Carver Tech -Mervo Tech	High Schools: In every high school (25)	High Schools: -Francis Scott Key -Liberty -Century -Manchester Valley -Winters Mill -Westminster -North Carroll -South Carroll	High Schools: In every high school (5) excluding the Cecil County School of Technology	N/A

**Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City**

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Construction & Development	Construction Trades – Carpentry, Electrical, Plumbing and Masonry – All are based on the National Center for Construction Education and Research (NCCER) standards and prepare students for further education and careers in the industry, with a focus on one of the four areas. Graduates meet Apprenticeship Training Requirements as well as an opportunity to take the NCCER student certifications.	N/A Construction POS are locally developed	Center of Applied Technology – North (CAT-N) Center of Applied Technology – South (CAT-S)	Carpentry -Edmondson-Westside -Reach! Partnership -Carver Tech -Mervo Tech Electrical -Reach! Partnership -Carver Tech -Mervo Tech Masonry -Carver Tech -Mervo Tech Plumbing -Carver Tech	Carpentry -Owings Mills -Carver Center -Perry Hall -Lansdowne -Kenwood Electrical -Franklin -Lansdowne Plumbing -Western School of Technology -Kenwood	Masonry, Carpentry, Electrical: -Carroll County Career & Technology Center	Cecil County School of Technology: -Carpentry -Electrical -Plumbing-	N/A Construction POS are locally developed
	Construction Trades – Building Maintenance – HVAC, Industrial Maintenance, Welding Based on NCCER standards, students are prepared for further education and careers in the industry, with a focus on one of the three areas. Graduates meet apprenticeship training requirements met.	N/A Construction POS are locally developed	CAT-N CAT-S	HVAC- -Reach! Partnership -Carver Tech	HVAC- -Dulaney	HVAC, Welding: -Carroll County Career & Technology Center	Building Maintenance Core- Cecil county School of Technology	N/A

**Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City**

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Construction & Development (continued)	Construction Design & Management Using a project-based learning approach to advance students' understanding of the design-build-maintain process, advanced architectural and design skills are developed through lab-based instruction using Autodesk software tools. Students develop a portfolio to demonstrate knowledge of each phase of the design and construction management process. Students can obtain industry certification in Auto CAD and articulated credit.	N/A	N/A	N/A	High Schools: -Milford Mill -New Town -Eastern Tech	N/A	N/A	N/A
Consumer Services, Hospitality & Tourism	Food & Beverage Management (ProStart) In partnership with the National Restaurant Association Educational Foundation (NRAEF) students are introduced to a wide variety of careers within the restaurant, food service and hospitality industry. Students complete an industry-mentored work-based learning experience and can earn articulated credit.	High Schools: In every high school (9) excluding Harford Technical	High Schools: In every high school (12)	High Schools: -Edmondson-Westside -Forest Park - National Academy Foundation -Augusta Fells Savage -Youth Opportunity Academy -Carver Tech -Mervo Tech	High Schools: -Eastern Tech -Sollers Point -Western Tech -Carver Center	High Schools: -Francis Scott Key -Liberty -Century -Manchester Valley -Winters Mill -Westminster -North Carroll -South Carroll	High Schools: In every high school (5) and Cecil County School of Technology	N/A Food Service POS are locally developed

**Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City**

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Consumer Services, Hospitality & Tourism (continued)	Culinary Arts The American Culinary Federation (ACF) is the partner with this program in which students prepare for careers in the food and beverage industry, with a focus on Culinary Arts or Professional Baking. Students may earn ACF's Certified Junior Culinarian credential and may also earn articulated credit at Stratford University.	N/A	CAT-N CAT-S	N/A	N/A	-Carroll County Career & Technology Center	N/A	N/A
	Lodging Management Program This program introduces students to careers within the multiple aspects of the lodging industry, such as the rooms division, general department and facilities management, marketing and sales, and food and beverage services. The American Hotel and Lodging Educational Institute (AHLEI) designed the program and the Certified Rooms Division Specialist (CRDS) credential.	N/A	N/A	High Schools: -The National Academy Foundation	N/A	N/A	N/A	N/A

**Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City**

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Consumer Services, Hospitality & Tourism (continued)	Academy of Hospitality and Tourism (NAF) The National Academy Foundation (NAF) is a partner in this program which prepares students for postsecondary education and careers in one of the world's largest service industries, hospitality and tourism. In addition to the internship, students may also complete a college-level course during the senior year of high school.	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Careers in Cosmetology Students are instructed in the art and science of cosmetology as well as all aspects of the industry. Salon management is an integral part of the classroom and clinical experience. The 1,500 hour program includes classroom instruction, clinical experience, related mentored work-based learning experience and a senior capstone project. Students are required to take the Maryland State Board of Cosmetologists' Examination to obtain a state license to practice in this field.	Harford Technical	CAT-N CAT-S	High Schools: -Carver Tech -Mervo Tech -Edmondson/ Westside	High Schools: -Milford Mill -Carver Center -Sollers Point -Western Tech	-Carroll Co. Career & Technology Center	Cecil County School of Technology	N/A

**Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City**

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Environmental, Agricultural & Natural Resources	Horticulture Services: Certified Professional Horticulturalist (CPH) This program is based upon requirements for the Certified Professional Horticulturalist (CPH) certification used by the Maryland "Green Industry." Students earn the Student-Level CPH certification by passing the industry exam.	N/A	N/A	N/A	N/A	High Schools: -Francis Scott Key -Liberty -Century -Manchester Valley -Winters Mill -Westminster -North Carroll -South Carroll	Cecil County School of Technology	N/A
	Curriculum for Agricultural Sciences Education (CASE) CASE is a national program that offers students a rigorous curriculum incorporating the National Academic Standards and Agriculture Food and Natural Resources (AFNR) Content Standards. Upon successful completion of the program, students have the opportunity to earn college credit.	N/A	Southern HS Phoenix Center	High Schools: -Benjamin Franklin -W.E. B. Dubois	High Schools: Hereford	High Schools: -Francis Scott Key -Liberty -Century -Manchester Valley -Winters Mill -Westminster -North Carroll -South Carroll	N/A	N/A
	Environmental Studies/Natural Resources This four-course sequence covers both environmental and natural resource management technologies and current issues related to those fields of study. Students engage in technical research and writing as it relates to real-world problem solving. Students can earn college credit through articulation agreements.	N/A	N/A	High Schools: -Independence School (piloting)	High Schools: Western Tech (piloting)	N/A	N/A	N/A

Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Health & Biosciences	Academy of Health Professions (AHP) AHP students progress through two foundation courses before applying what they have learned to real-life health care situations as part of a specialized health care course. Upon completion of the program, students can earn state and/or nationally recognized certifications (Certified Nursing Assistant; Geriatric Nursing Assistant; Pharmacy Technician; and Dental Assistant), and/or college credit through articulation agreements.	Harford Tech	CAT-N CAT-S	High Schools: -Reach! Partnership School Edmondson-Westside -Patterson -Mervo Tech -Vivien T. Thomas Medical Arts Academy	High Schools: -Eastern Tech -Sollers Point -Western Tech -Milford Mill	-Carroll County Career & Technology Center	N/A	Applications & Research Laboratory
	Biomedical Sciences: Project Lead the Way (PLTW) This program is based upon the national content standards for Science, Mathematics, and English Language Arts and the Accountability Criteria for the national Health Care Cluster Foundation Standards. Transcribed credits are offered to students who successfully complete the program.	-Bel Air HS -Havre de Grace HS	Glen Burnie HS	High Schools: -Maryland Academy of Technology and Math -Friendship Academy of Science and Technology -Bluford Drew Jemison STEM Academy West -Western -Paul Laurence Dunbar -Vivien T. Thomas -Medical Arts Academy	High Schools: -Franklin -Lansdowne -New Town -Overlea -Woodlawn -Sollers Point	-Carroll County Career & Technical Center	High Schools: -Perryville HS	N/A

Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Human Resource Services	Fire Science (Maryland Fire and Rescue Institute - MFRI) In partnership with the MFRI of the University of Maryland, students progress through classroom instruction, as well as formal training at local fire companies. Students complete work-based learning and sit for seven certification exams (CPR; Fire Fighter I; NIMS ICS: Hazardous Materials Operator; Firefighter II; Rescue Technician – Site Operations; and Rescue Technician – Vehicle and Machinery Extrication).	Students can participate from all nine comprehensive high schools	N/A	High Schools: -Frederick Douglas	N/A	N/A	Cecil County School of Technology	N/A
	Teacher Academy of Maryland (TAM) TAM prepares students for further education and careers in the education profession. After completing three courses in the high school, students take the education academy internship course where they are placed with a mentor teacher in a local school in a critical shortage area. Students take the ParaPro industry certification for immediate entry into employment. In addition, students have the opportunity to take PRAXIS I and earn transcribed credits at several colleges and universities.	High Schools: -Aberdeen -Bel Air -C Milton Wright -Edgewood -North Harford -Patterson Mill	N/A It is a locally developed program	High Schools: -KASA -Patterson -Western -Mervo Tech -Carver Tech	High Schools: -Dundalk -Eastern Tech	High Schools: -Francis Scott Key -Liberty -Century -Manchester Valley -Winters Mill -Westminster -North Carroll -South Carroll	High Schools: -Bohemia Manor -Elkton -North East -Perryville -Rising Sun	In every high school (12) excluding the Applications & Research Laboratory

**Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City**

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Human Resource Services (continued)	Homeland Security & Emergency Preparedness Students complete a foundations course, select one of three pathways: Homeland Security Sciences; Criminal Justice and Law Enforcement; or Information and Communications Technology, then complete the Internship/Capstone Experience course. The Information and Communications Technology pathway offers the Geographic Information Systems (GIS) and Remote Sensing (RS) entry-level technician certification. All pathways have statewide articulation.	High Schools: Joppatowne	Meade HS	High Schools: -Friendship Academy of Engineering and Technology -Digital Harbor -Heritage	High Schools: -Dundalk	High Schools: -Carroll County Career & Technology Center	N/A	Applications & Research Laboratory
Information Technology	Academy of Information Technology (NAF) This program partners with the National Academy Foundation to prepare students for postsecondary education and careers in a wide range of Information Technology (IT) careers. Upon completion of a foundations course, students select an area of specialization: IT Programming; IT Networking; or Web Design. Industry certification is available through Microsoft, CompTIA, Cisco, Oracle and WOW, depending upon the program option selected.	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Information Technology (continued)	Database Academy (Oracle) This program prepares students for successful careers in database administration, database programming, IT consulting, IT project management, and computer engineering. Students are prepared for the Oracle Certified Associate (OCA) certification.	N/A	South River HS	-Digital Harbor	N/A	N/A	-Elkton HS -Rising Sun HS	N/A
	IT Networking Academy Students in this program are prepared for advanced study in IT and for the industry certifications such as CompTIA (A+, Network+, and Server) and Cisco CCENT and CCNA.	Harford Tech	CAT-N and CAT-S	-Baltimore Antioch -Friendship Academy -Bluford Drew -Edmondson/West-side -Northwestern HS -Western -Digital Harbor -National Academy Foundation -New Era Academy -Academy for Career and College Exploration -Baltimore Talent -Augusta Felis Savage -Maritime Industries - -Carver Tech -Mervo Tech	High Schools: -Dulaney -Milford Mill -New Town -Parkville -Woodlawn -Eastern Tech -Sollers Point -Western Tech	-Carroll Co. Career & Technology Center	N/A	N/A

Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Information Technology (continued)	IT Computer Science and Cyber Security The program starts with an overview of the Computing and Information Technology field and progresses to a more in-depth study of Computer Science. Students can earn college credit and industry certification such as Microsoft Technology Associate (MTA).	N/A	N/A	-Baltimore Polytechnic Institute(Poly) - Digital Harbor	In every high school (25)	N/A	N/A	N/A
Manufacturing, Engineering & Technology	Pre-Engineering: Project Lead The Way (PLTW) This program prepares students for further education and careers in engineering and engineering technology. After completing foundation-level courses, students select an area of specialization including: Computer Integrated Manufacturing; Civil Engineering; Biotechnical Engineering; or Aerospace Engineering. Students can earn transcribed credit at PLTW affiliated colleges and universities nationwide.	-Aberdeen HS -C. Milton Wright HS	High Schools: South River Meade Severna Park Glen Burnie	-Maryland Academy of Technology and Math -Friendship Academy -Bluford Drew Edmondson/West-side -Poly -Patterson -Mervo Tech -W.E.B Dubois -The National Academy Foundation High School	High Schools: -Chesapeake -Dulaney -Dundalk -Owings Mills -Parkville -Pikesville -Woodlawn	-Carroll Co. Career & Technology Center	High Schools: -Bohemia Manor -Elkton -Northeast -Perryville -Rising Sun	In all 12 high schools and in the ARL

**Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City**

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Manufacturing, Engineering & Technology (continued)	Manufacturing Engineering Technologies The program aligns with the standards outlined in the National Institute for Metalworking Skills (NIMS) and prepares students for the manufacturing industry and includes a focus on Manufacturing, Process Design and Development, Production, Supply Chain Logistics, Health, Safety and Environment as well as Quality Assurance and Continuous Improvement. Students can earn industry-recognized credentials and college credit.	N/A	N/A	N/A	N/A	N/A NIMS POS is locally developed	N/A	N/A
Transportation Technologies	Automotive Technology This program incorporates the Automotive Service Excellence (ASE) program certification standards and the National Automotive Technicians Education Foundation (NATEF) standards. The program is accredited by NATEF. Students can earn ASE student achievement certification and college credit.	Harford Technical	CAT-N and CAT-S	Mervo Tech	-Eastern Tech -Sollers Point -Western Tech Milford Mill HS	-Carroll Co. Career & Technology Center	CCST	ARL

Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Transportation Technologies (continued)	Autobody/Collision Repair Technician The program was developed in accordance with the Inter-Industry Conference on Auto Collision Repair (I-CAR), National Automotive Technicians Education Foundation (NATEF), and Automotive Service Excellence (ASE) guidance and directives. The program is accredited by NATEF and students can earn an ASE student achievement certificate and college credit.	N/A	CAT-N CAT-S	N/A	N/A	-Carroll Co. Career & Technology Center	N/A	N/A
	Medium-Heavy Truck Technician Students in this program have the opportunity to earn Automotive Service Excellence (ASE) and National Automotive Technicians Education Foundation (NATEF) student certificates as well as college credit. The program is accredited by NATEF.	N/A	CAT-N	N/A	Sollers Point Tech	Carroll Co. Career & Technology Center	N/A	N/A

**Maryland Career and Technology Education Programs of Study (POS)
Harford, Anne Arundel, Baltimore, Carroll, Cecil and Howard Counties and Baltimore City**

Career Cluster	Maryland CTE Programs of Study (POS)	Local School Systems						
		Harford	Anne Arundel	Baltimore City	Baltimore County	Carroll	Cecil	Howard
Cooperative Education	Career Research and Development (CRD) Career Research and Development (CRD) is a CTE program that prepares students with the academic, technical and workplace skills necessary to seek further education and employment in a career field of their interest upon graduating from high school. Students may be eligible for an industry certification, if applicable.	In every high school (9) excluding Harford Technical	In every high school excluding Severna Park	-Benjamin Franklin Middle/High School -Maritime Industries Academy -Frederick Douglass High School and 6 alternative schools	In every high school (25)	-The Gateway School	In every high school (5) and CCST	In every high school (12) excluding the ARL

The Maryland State Department of Education was asked to provide information on Career and Technology Education state programs of study for surrounding school systems. This list contains the state programs of study and notes if a program is not applicable (N/A) because the school system does not offer it or if it is a locally developed program.

Appendix 8

**HARFORD COUNTY PUBLIC SCHOOLS
 LOCALLY DEVELOPED AND STATE APPROVED
 CAREER AND TECHNOLOGY EDUCATION (CTE)
 PROGRAMS OF STUDY**

Career Cluster	CTE Program of Study	Location
Arts, Media & Communication	N/A	N/A
Business Management & Finance	Business Data Processing & Related Programs	Aberdeen HS Fallston HS C. Milton Wright HS North Harford HS
Construction & Development	Brick, Block and Stone Masonry	Harford Technical
	Carpentry	Harford Technical
	Electrician	Harford Technical
	Industrial Electronics	Harford Technical
	Heating, Air Conditioning & Refrigeration Mechanics, General	Harford Technical
	Drafting, General	Harford Technical
	Machine Tool Operation/Machine Shop	Harford Technical
	Welding, Brazing and Soldering	Harford Technical
Consumer Services, Hospitality and Tourism	Institutional Food Workers and Administrators, General	Harford Technical
Environmental, Agriculture & Natural Resources	Agricultural Production, General	Harford Technical North Harford HS
	Horticulture, General	Harford Technical
	Natural Resources and Agricultural Sciences	North Harford HS
Health & Biosciences	Health Occupations	Harford Technical
Human Resource Services	Early Childhood Education	Edgewood HS Joppatowne HS Patterson Mill HS Aberdeen HS Bel Air HS Fallston HS C. Milton Wright HS North Harford HS Havre de Grace HS
Information Technology	N/A	N/A
Manufacturing, Engineering & Technology	N/A	N/A
Transportation Technologies	N/A	N/A
	Automotive Body Repair	Harford Technical

Appendix 9



Lillian M. Lowery, Ed.D.
State Superintendent of Schools

200 West Baltimore Street • Baltimore, MD 21201 • 410-767-0100 • 410-333-6442 TTY/TDD

April 30, 2014

Mrs. Barbara P. Canavan
Superintendent
Harford County Public Schools
102 South Hickory Avenue
Bel Air, Maryland 21014

Dear Mrs. Canavan:

On behalf of the Maryland State Department of Education (MSDE), Division of Career and College Readiness (DCCR), I wish to thank you and the staff of Harford County Public Schools (HCPS) for the time and effort put forth in preparation for and during the March 7, 2014 monitoring site visit.

As you are aware, the primary purpose of this monitoring visit was to assess the system of Career and Technology Education (CTE) and identify areas of strength and opportunities for improvement. Based on the visit, we are confident Harford County Public School will continue to improve its Perkins administration, implementation of CTE programs, and accountability systems.

Attached please find the monitoring team's report. Harford County's CTE system was reviewed in seven areas which align with the self-assessment document that the HCPS staff completed prior to the visit. The streamlined report is organized with the purpose, list of monitoring team members, the background of HCPS' system of CTE, overall commendations, challenges, and recommended actions.

Again, many thanks for your efforts to host a productive monitoring visit and for your willingness to engage in conversations about better ways to prepare CTE students at HCPS for a successful future.

Sincerely,

Katharine M. Oliver
Assistant State Superintendent
Division of Career and College Readiness

KMO:nh:dw

Attachments

c: Dean Kendall Angela Thornton Rebecca Walker
Michael Cohen Pamela Smith Nina Roa CTE Leadership Team

**Harford County Public Schools
Career and Technology Education
Monitoring Visit Report**

PURPOSE

Every five years, members from the Maryland State Department of Education (MSDE), Division of Career and College Readiness (DCCR) and a monitoring team meet with representatives from the local school systems (LSS) and community colleges for a formal monitoring visit. The purpose of the monitoring visit is to evaluate the improvement of Career and Technology Education (CTE) programs at the secondary and postsecondary levels. The process involves four steps:

- Completing the self-assessment by the LSS or community college,
- Conducting the monitoring visit and preparing the monitoring report,
- Incorporating the feedback from the monitoring report into the next submission of the CTE Local Plan for Program Improvement, and
- Submitting the CTE Local Plan to MSDE.

The self-assessment document serves as the basis for the discussion at the monitoring visit. Written feedback, including overall commendations, challenges and recommended actions, is provided following the visit. This streamlined reporting approach affords the local school system the opportunity to more easily incorporate the feedback into the next submission of the CTE Local Plan for Program Improvement.

MONITORING TEAM

<u>Name</u>	<u>Affiliation</u>
Jeanne-Marie Holly	Maryland State Department of Education
Nina Roa	Maryland State Department of Education
Nancy Hauswald	Maryland State Department of Education
Mary O'Connor	Maryland State Department of Education
Dean Kendall	Maryland Higher Education Commission
Angela Thornton	Maryland Department of Business and Economic Development
Michael Cohen	Montgomery County Public Schools
Pamela Smith	Prince George's County Public Schools
Rebecca Walker	Cecil College

**HARFORD COUNTY PUBLIC SCHOOLS
REPORT ON MONITORING VISIT
MARCH 7, 2014**

BACKGROUND

Harford County has nine comprehensive high schools and one technical high school, Harford Technical High School (HTHS). Career and Technology Education (CTE) programs of study (POS) are offered at all ten schools. POS offered at comprehensive high schools include Administrative Services, Accounting/Finance, Business Management, Career Research and Development, Early Childhood Education, Fire Science (MFRI), Homeland Security and Emergency Preparedness, Marketing, National Academy of Finance (NAF), Project Lead The Way (PLTW) Pre-Engineering, PLTW Biomedical Sciences, ProStart, and Teacher Academy of Maryland. (Note: all programs are not offered at every school.)

POS taught at HTHS include Academy of Health Professions, Automotive Technician, Careers in Cosmetology, IT Networking Academy, and PrintEd. The Technical High School is currently at capacity, and a waiting list is kept for openings. Gateway to Technology, a pre-engineering program for middle school students created by PLTW, is being expanded to include all middle schools.

Harford County Public Schools (HCPS) currently offers 33 CTE programs in all of Maryland's ten Career Clusters; 16 of the 33 are Maryland POS. In 2013, 7,400 students enrolled in CTE classes (this is up 9.3% over the previous year). Over 61% of the class of 2013 completed a CTE POS; 58% of those completers are dual completers, up 3.51% from 2012.

The Local Advisory Council (LAC), with members from local industry as well as the Susquehanna Workforce Network and Harford Community College (HCC), meets six times per year and shares local labor market information with the school system. The LAC also identifies needs within the members' represented industries and provides recommendations for CTE program development and improvement at both the secondary and postsecondary levels.

COMMENDATIONS

- The school system and HCC share an active, engaged joint LAC that is one of five Citizen Advisory Committees reporting directly to the HCPS Board of Education. The LAC uses data collected from a variety of sources to develop and present an annual report for the Board of Education. This report identifies short-term, mid-term and long-term goals to strengthen CTE programs and is the basis for the CTE Five-Year Plan for Program Improvement. As a result of these recommendations, the Board of Education, along with other agencies, has provided funding to support the implementation of the PLTW Gateway to Technology program in all middle schools.
- The CTE director has partnered with representatives from the school system's Institutional Research, Planning and Effectiveness Department to develop a website for teachers to record technical skill assessments (TSAs) pass rates while also tracking student internship hours, which has streamlined data collection and improved data accuracy. To further improve data accuracy, the IT Department is working to develop electronic student record cards.

- The school system uses local funding to pay for TSAs, rather than require payment by students or utilize Perkins funds. Testing sites are located in the high schools, increasing the number of students who can access the tests.
- To reduce the need for developmental math coursework in college, the school system offers a Transitional Studies math course at high schools to those students in need. The school system also partners with Harford Community College to facilitate on-line enrollment in several college courses for high school students who have home access to the Internet.
- HCPS recently launched a partnership website for both employers and schools to assist in arranging internships and job shadowing for students and instructors.

CHALLENGES IDENTIFIED BY THE MONITORING TEAM

The school system has taken several steps to address the underreporting that often occurs with the manual data collection system currently used in the schools to report the county's dual completion rate (1S3). This is still a concern because the process is manual and subject to human error.

Career and Technical Student Organizations (CTSO) are regarded as an integral part of career and technology education and play an important part in helping young people gain career, leadership, and personal skills that maximize employability and the ability to become productive citizens in the workforce, home, and community. Participation in CTOS in HCPS has increased since the last monitoring visit, but is still very low in the comprehensive high schools, averaging 6% of all CTE students.

Harford Technical High School is operating at capacity, and over half of the CTE programs are not Maryland Programs of Study. To increase the number of new Maryland CTE POS, expansion could occur in the nine comprehensive high schools.

Work-Based Learning (WBL) opportunities for students are difficult to secure due to the economy and other competing programs. Unpaid WBL positions are equally difficult to find because businesses have downsized and employees don't have time to mentor interns.

The school system offers a transitional math course in partnership with HCC. Success in the transitional math course is low; so many students do not receive credit for the class when they transition to postsecondary institutions.

HCPS exceeded the 2013 target for non-traditional participation. The school system's performance for non-traditional completion increased 2% from 2012, but the system's target has not been met for the past three years.

RECOMMENDED ACTIONS

Electronic Data Entry

Research the requirements for establishing and operating an Electronic Data Capture System to improve CTE data collection. To learn more about this topic and how an electronic data system has improved data accuracy at a local school system, contact Marjorie Lohnes, Supervisor of CTE, Carroll County, at mrlohne@carrollk12.org.

Career and Technical Student Organizations (CTSOs)

Explore ways to increase CTSO membership, with support from LAC and program advisory committee (PAC) members. Consult with other school systems that have large student memberships in CTSOs for ideas on how to build long-term sustainability and increase membership. Contact Kristine Pearl, Career and Technology Education Supervisor for Frederick County Public schools, for additional ideas. Her email address is Kristine.Pearl@fcps.org.

Expanding Rigorous CTE at Comprehensive High Schools

Consider coordinating a stakeholder group composed of representatives from industry/business, economic development, postsecondary and secondary institutions to conduct a thorough review of the current CTE programs of study offered at Harford County's comprehensive high schools. The group should provide recommendations, based on their review, to the local school system (LSS).

Based on the results of this recommended Harford County CTE Comprehensive High School Review, consider including in the system's Five-Year CTE Plan a timeline for expanding one or more new STEM-related POS like PLTW Biomedical Sciences, IT Computer Science and/or Interactive Media Production. MSDE issues an annual grant competition for a Career and Technology Education Grant (formerly Reserve Fund Grant) to assist with program implementation of STEM-related CTE POS. These POS could be housed in the comprehensive high schools. Offering the new rigorous and relevant STEM POS will also increase Harford County's dual completion. Wicomico County recently conducted a similar CTE Design Review. For more information on this process, contact Bryan Ashby, Supervisor of Career and Technology Education, at bashby@wcboe.org.

Increasing Work-Based Learning Opportunities

Explore ways to increase WBL opportunities, both paid and unpaid, with the LAC and PAC members. With their help and the use of the new Harford County Public Schools' partnership website, develop a marketing campaign for increasing the community's and business' understanding of the benefits of WBL to students and businesses.

Early-College Bridge Programs

Partner with HCC to analyze the current transitional math course taught at several county high schools and create a plan for improving the students' pass rates. Recruit CTE students to enroll in the course and consider offering this course at Harford Technical High School.

Anne Arundel Community College (AACC) and Anne Arundel County Public Schools have partnered to offer a similar early-college bridge program, called *Math First*. The results of the initial pilot have been very successful. To learn more about this initiative, contact Kathy Beauman, Executive Director, Business Education Partnerships, at kmbeauman@aacc.edu.

Non-Traditional Completion

Consult with other school systems on methods to improve non-traditional enrollment and completion in CTE programs. Calvert County has had some success in this area; contact Mark Wilding, Career and Technology Director/Principal, for more information at wildingm@calvertnet.k12.md.us. MSDE will have additional guidance on this topic in early May. Contact Mary O'Connor, CTE Regional Coordinator, MSDE, at mloconnor@msde.state.md.us for a list of resources and successful strategies implemented by local school systems for increasing non-traditional enrollment and completion.

Research and consider joining The National Alliance for Partnerships in Equity (NAPE). NAPE is a consortium of state and local agencies, corporations, and national organizations committed to the advancement of equity and diversity in classrooms and workplaces. For more information about membership and benefits go to <http://www.napequity.org/about-us/mission/>.

Consider introducing career path exploration focusing on non-traditional careers available at the high schools with elementary students. For information on how to implement this strategy, contact Marjorie Lohnes, Supervisor of CTE, Carroll County at mrlohne@carrollk12.org. Administering career aptitude tests to students in grades 4-7 would provide the school system with additional opportunities to promote non-traditional careers, increase career exploration, and provide students with more knowledge to make more informed choices as they prepare for high school.

NEXT STEPS

Include strategies for implementing the recommendations in this report into the next submission of the CTE Local Plan for Program Improvement. The next submission date is May 16, 2014.

Appendix 10



Lillian M. Lowery, Ed.D.
State Superintendent of Schools

200 West Baltimore Street • Baltimore, MD 21201 • 410-767-0100 • 410-333-6442 TTY/TDD • MarylandPublicSchools.org

October 28, 2014

Mrs. Barbara P. Canavan
Superintendent
Harford County Public Schools
102 South Hickory Avenue
Bel Air, Maryland 21014-3731

Dear Mrs. Canavan:

I support the program offerings described in the letter dated August 20, 2014, for the proposed replacement of the Havre de Grace Middle/High School. Documentation received by the Maryland State Department of Education (MSDE) describes the extensive study that took place with key stakeholders to determine economic and employment outlook for the programs of study identified within the letter.

I am pleased that the Harford County staff is planning to add the IT Computer Science Program of Study (POS), as well as continue to offer these four well-performing POS:

- Business Management
- Finance and Accounting
- Marketing
- Career Research & Development

Many high-wage jobs will be available in Harford County, and especially at the Aberdeen Proving Ground, to graduates of the rigorous IT Computer Science program. Labor market analyses support the continued offering of the four other Programs of Study.

I concur with the decision to eliminate the low-performing Business Administrative Services, as well as adding only a commercial kitchen to the plans. We appreciate that you agree that this would be a prudent use of resources, focusing on improving the outcome for students. We understand that current students need to finish out the ProStart program, and are pleased that the commercial kitchen will allow for an easy conversion to the Culinary Arts Program of Study in the future.

Thank you for the additional documentation provided by Ms. Susan Garrett, stating that the many restaurants and hotels in Harford County can absorb the graduates of the Pro-Start program. I am encouraged by the formation of a local study group formed by ProStart teachers in order to improve students' performance in the program. Support for future renovations of Harford County schools will proceed more smoothly when ProSmart performance numbers improve, and movement toward Culinary Arts upgrades begins.

Mrs. Barbara P. Canavan
Page 2
October 28, 2014

Although the Maryland Transportation Technology cluster team has not developed a Logistics and Distribution program, the cluster team anticipates the creation of such a program by FY16. As the recent *Labor Market Analysis of the Susquehanna Workforce Investment Area* report states, Harford County is ideally situated along a major corridor for transportation-centered educational programs. I am hopeful that Harford County Public Schools would be willing to pilot the new program when it is available.

Ms. Mary O'Connor, CTE Regional Coordinator for Harford County, is available to support your program in any way. If you have questions or need further assistance, please contact Mary at 410-767-0164 or at her new email: mary.o'connor@maryland.gov.

Sincerely,



Katharine M. Oliver
Assistant State Superintendent
Career Technology and College Readiness

Attachment

KMO:moc

c: Jeanne-Marie Holly
Kathy McNerney
Mary O'Connor
Susan E. Garrett
Barbara Bice

MSDE - DCCR
Attachment 1 - FACILITIES UTILIZATION TABLE

Local School System: Harford County Public Schools Date: August 20, 2014

MSDE School Number: 120678 School Name: Havre de Grace High School

CTE Director: Susan E. Garrett Phone: 410-588-5289 Email: susan.garrett@hcps.org

Facilities Planner: Ariana Langford Phone: 410-809-6124 Email: ariana.langford@hcps.org

Existing total school enrollment is 583 FTE students. (Include all students.)
 Projected total school enrollment is 598 FTE students one year after construction completion.
 Proposed completion date: Summer, 2018

1	2	3	4	5	6	7	8	9	10	11
Existing Program Name	Existing CIP Code	Proposed Program Name	Proposed CIP Code	Existing CTE Enrollment 4/30/2014_	Prop. CTE Enrollment 2018	Existing CTE Teachers (FTE) 4/30/2014_	Prop. CTE Teachers (FTE) 2018_	Typical Class or Section Size	Existing Number of Classrooms & Labs *	Proposed Number of Classrooms & Labs *
Early Childhood Education	200201			80	80	0.8	0.8	15	1	1
Fire Protection and Safety Tech	430201				5		0.1	5	0.1	0.1
Biomedical Sciences	511150			17	120	0.1	1.5	15	0.1	1.8
Business Management	520251			55	50	0.8	0.8	15	0.8	0.8
Accounting/ Finance	520354			11	15	0.1	0.1	15	0.1	0.1
Administrative Services	520451									
Food and Beverage Management	520955			131	140	1.2	1.2	20	1	2
Marketing	521451			3	15	0.1	0.1	15	0.1	0.1
Career Research and Development	860000			54	50	0.5	0.9	20	0.9	0.9
		Computer Science	110250		50		1	15		2
TOTALS:				351	525	3.6	6.5		4.1	8.8

* Count a classroom and its associated laboratory as one (1).

Susan E. Garrett 8-20-14
 Signature of CTE Director Date

Appendix 11

**Harford Community College
Career and Technology Programs**

July 2014			
Name	A.A.S.	Cert.	Continuing Education/ Apprenticeship Program
Accounting	X	X	
Business Management - Administrative Professions	X	X	
Business Management - Agribusiness	X	X	
Business Management - Entrepreneurship	X	X	
Business Management - Human Resources	X	X	
Business Management - Marketing	X	X	
Computer Aided Design and Drafting (CADD)	X	X	
Computer Information Systems	X		
Computer Information Systems - Programming		X	
Computer Information Systems - Software		X	
Computer Information Systems - Unix		X	
Engineering Technology	X		
Information Assurance and Cybersecurity	X	X	
Criminal Justice	X		
Design & Technical Theatre	X		
Early Childhood Education	X		
ElectroNeuroDiagnostic Tech.	X		
Environmental Technology	X	X	
Graphic Design	X		
Advertising & Sales Promotion	X	X	
Prod./Announcing Electr. Media	X	X	
Medical Assisting	X	X	
Medical Office Assistant		X	
Nursing	X		
Practical Nursing		X	
Paralegal Studies	X	X	
Photography		X	
Biotechnology		X	
Histotechnology	X		
Science Laboratory Technology	X		
Heating and Air Conditioning Apprenticeship			X
Electrical Apprenticeship			X
Plumbing Apprenticeship			X
Towson University in Northeastern Maryland	B.A./B.S.		
Business Administration	X		
Information Technology	X		
Integrated Early Childhood Education/Spec. Ed.	X		
Integrated Elementary Education/Spec. Ed.	X		
Psychology	X		
Sociology (Criminal Justice concentration)	X		

Appendix 12

Technical High School

Tuesday, October 14, 2014

Estimated Budget Summary

* Cost estimate to construct a New Technical High School Facility: (Approximately 220,000 square feet) Utilizing the current State cost per square foot for July 2014: Building only (less site development): \$233.00/s.f. Construction (with site development for new construction @ 12%): \$260.96/s.f. 220,000 X \$260.96/s.f. =	\$57,411,200.00
* Contingency: \$57,411,200.00 X 3% =	\$1,722,336.00
* F&E: \$57,411,200.00 X 9% =	<u>\$5,167,008.00</u>
Total:	<u><u>\$64,300,544.00</u></u>

Note:

The Estimated Budget does not include the following:

- *Design Costs
- *Construction Administration Costs
- *Land acquisition costs
- *Site Development Costs are based on 12% of Building Cost
- *Miscellaneous Costs, which include but are not limited to:
 - **Connection fees
 - **Bringing in new services (Gas & Electric)
 - **Material Testing Services
 - **Site surveys and boundary information

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