

BATH COUNTY SCHOOL BOARD

AGENDA ITEM: INFORMATION { X } ACTION { } CLOSED MEETING { }

SUBJECT: SUPERINTENDENT’S PRESENTATIONS/REPORTS

CTE Report – Mertz Staff

BACKGROUND: The Virginia Association of Career and Technical Education (Virginia ACTE) has developed several documents that outline facts and figures, along with issues, pertaining to CTE in Virginia.

Issues and Solutions for Career and Technical Education in Virginia for 2015-2016 presents critical issues facing CTE programs, in particular those experienced by students and employers. A copy of this report follows but it can also be viewed online at
http://www.virginiaacte.org/documents/2015-16/issues_solutions2015-16.pdf

Connecting Career Preparation to the Workforce is a fact sheet that provides information that illustrates how Virginia is preparing high school students for college and careers. In 2014-2015, CTE students earned more than 128,850 nationally recognized and Virginia Board of Education approved industry credentials. A copy of this document follows, but it can best be viewed online at
<http://www.virginiaacte.org/documents/2015-16/factsheet2015-16.pdf> .

Teachers will provide a brief overview of current programs offered at Mertz Career and Technical Center.



2015–16

ISSUES AND SOLUTIONS

for Career and Technical Education in Virginia

Educators and business representatives from across Virginia, along with 10 organizations representing Career and Technical Education (CTE) professionals, developed this document. The Virginia Association for Career and Technical Education (Virginia ACTE) welcomes comments on these policy issues from CTE stakeholders—citizens, parents, and members of the boards that govern Virginia’s public education. We welcome dialogue concerning these proposals and seek support from anyone interested in providing diversity of opportunity for all of Virginia’s children.

Virginia Association for Career and Technical Education
www.virginiaacte.org

POLICY ISSUES IN BRIEF

1. *Virginia ACTE supports meaningful, industry-recognized standards, assessments, and credentials for CTE programs, staff, and students.*
2. *Virginia ACTE supports continued priority funding for CTE classroom lab equipment and program improvement to prepare students for a competitive workforce and further education.*
3. *Virginia ACTE supports funding for the Governor’s STEM Academies and Governor’s Health Science Academies, which prepare students for high-demand, high-wage, and high-skill careers in Virginia.*
4. *Virginia ACTE supports adequate funding to sustain the CTE Resource Center and its work to expand college and career readiness through continued integration of secondary and postsecondary CTE curricula with Standards of Learning and through alignment with industry and professional standards and certifications.*
5. *Virginia ACTE supports increased efforts by Virginia’s colleges and universities to implement and, where they already exist, strengthen undergraduate and graduate teacher preparation programs in CTE.*

POLICY ISSUE 1

Virginia ACTE supports meaningful, industry-recognized standards, assessments, and credentials for CTE programs, staff, and students.

Rationale

Education- and work-related earned credentials are important milestones for many career pathways. Employers value credentials because they help to determine the skill and education level of job applicants without having to administer reassessments and help reduce training and employee acquisition costs.

Increasing opportunities to earn industry credentials, such as state licensures, industry certifications, and occupational competency and Workplace Readiness Skills assessments are vital to the New Virginia Economy Workforce Initiative detailed in the Governor's Executive Order 26.

- According to the 2013 report "Recovery: Job Growth and Education Requirements through 2020," there will be 55 million job openings in the economy through 2020, with 24 million from newly created jobs and 31 million due to retirement. In addition, at least 5 million new workers with postsecondary certificates and 10 million workers with some type of postsecondary education will be needed ("Recovery: Job Growth and Education Requirements through 2020," Georgetown University Center on Education and the Workforce, 2013).
- Virginia's CTE programs are providing multiple avenues for students to earn credentials, continue their education beyond high school, and document their skills for employers.
- The Standard Diploma requirement includes an industry credential, a state licensure examination, a national occupational competency assessment or the Virginia Workplace Readiness Skills assessment, or satisfactory competency-based instruction in a particular subject area where a credential is not readily available.
- The current Standards of Quality state, "... Career and technical education programs shall be aligned with industry and professional standard certifications, where they exist" (Code of Virginia § 22.1-253.13:1B).
- Earned industry credentials are part of the Virginia Index of Performance program to recognize schools and school divisions for student achievement.
- Virginia school accreditation reflects overall academic achievement, and now the number of graduates earning a Virginia Board of Education-approved industry certification, an industry pathway certification, a state licensure, or an occupational competency credential in a CTE program as student-selected verified credit are part of the formula for calculating the final high school accreditation status.
- The General Assembly has funded industry certification examinations since 2006 and funding has remained level at approximately \$1.331 million, which is \$2.33 per CTE student enrollment.
- The 2015 General Assembly appropriated \$1.5 million to support students and teachers pursuing the information technology (IT) industry certifications for fiscal year 2016 (SY 2015-2016). These funds were previously appropriated for the Microsoft IT Academy initiative.
- Virginia has led the nation with industry-valued credentialing initiatives since 2001,

and 128,850 students throughout the commonwealth earned credentials during the 2014–2015 school year.

- Over the past three years, students have earned 34,704 Microsoft IT Academy certifications (Virginia Department of Education).
- 46,913 students took the Workplace Readiness Skills exam in 2014–2015 (CTE Program Highlights 2014–2015, Virginia Department of Education).
- Research shows that 43 percent of young workers with licenses and certificates earn more than those with an associate degree; 27 percent of young workers with licenses and certificates earn more than those with a bachelor’s degree; and 31 percent of young workers with associate degrees earn more than those with a bachelor’s degree (Georgetown University Center on Education and the Workforce, “Valuing Certificates,” presentation, 2009).
- The Virginia Board of Education has approved more than 350 credentialing examinations. Credentials are available in all 16 Career Clusters.
- Virginia ACTE was instrumental in securing a funding increase to assist students with credential testing. Without sufficient funding to assist students with credential testing, local school divisions would have difficulty ensuring that students meet the Standard Diploma requirements and would not be able to accrue value-added points in the school accreditation process.
- Teachers also must acquire industry certification and state licensure to provide the necessary instruction for students. Avenues must continue to be created and funded for teachers to achieve such credentials.
- Virginia Code §22.1-298.1 was amended in 2015 to state that, “teachers seeking an initial licensure with an endorsement in career and technical education shall have an industry certification credential in the area in which the teacher seeks endorsement. If the teacher has not attained an industry certification credential, the Board may, upon request of the employing school division or educational agency, issue the teacher a provisional license to allow time for the teacher to attain such credential.”

Virginia ACTE proposes the following recommendations to strengthen Virginia’s CTE system:

- 1.1 The General Assembly should fully fund credentialing assessment to help students complete industry certifications, occupational competency exams, Workplace Readiness Skills examinations, state licensures, and other valid, high-quality assessments, as approved by the Virginia Board of Education, as a part of their secondary CTE studies and Standard Diploma requirements.
- 1.2 Funding should continue to be available for CTE teachers to attain Virginia Board of Education-approved, industry-recognized certifications.
- 1.3 The Virginia Board of Education should continue to establish annual benchmarks for improvement in the number of students receiving industry credentials as indicated in the Performance Standards and State Report Card.

POLICY ISSUE 2

Virginia ACTE supports continued priority funding for CTE classroom lab equipment and program improvement to prepare students for a competitive workforce and further education.

Rationale

Under the Virginia Standards of Accreditation, high schools are expected to offer a minimum of three CTE programs to meet students' needs. High schools in the state exceed the minimum CTE programs and have multiple labs that must be regularly updated with new technology. Under the present funding level, local and federal funds support the largest percentages of CTE equipment resources.

- General Assembly funding allocated to CTE during the previous nine sessions has provided essential support for helping to keep Virginia CTE classrooms equipped with the technology and materials students will use in the workplace.
- The funding for school year 2015–2016 is \$1.8 million. This is the same amount funded for CTE equipment since 2006, with the exception of a \$500,000 (27.7 percent) one-time increase for 2008 only.
- Funds provided by the General Assembly are distributed among 132 school divisions, including middle and high schools, many local technical centers, and 10 regional career and technical centers, along with centers providing specific services to special populations. These funds are used to provide project-based and industry-relevant educational experiences not otherwise available to public school students.
- Equipment funding allocation is currently calculated according to the number of students enrolled in CTE courses, with a base funding level of \$2,000 per school division. The remainder of the funding is distributed on the basis of student enrollment in secondary CTE courses. The average equipment allocation is \$2,515 per CTE student enrollment (based on 2015–2016 funding from the General Assembly). The average cost of equipment in a standard CTE laboratory ranges from \$20,000 to more than \$250,000.
- Equipment funding allocation is also used to fund the 23 Governor's STEM Academies and 9 Governor's Health Science Academies.
- "Sixty-seven percent of respondents in a 2011 manufacturing skills-gap study indicated that they were experiencing a shortage of qualified workers—with 12 percent reporting severe shortages and 55 percent indicating moderate shortages. CTE plays a vital role in helping American business close this gap by building a competitive workforce for the 21st century" (Deloitte Consulting and The Manufacturing Institute, "Boiling Point? The Skills Gap in U.S. Manufacturing," 2011).

Virginia ACTE proposes the following recommendations to strengthen Virginia's CTE system:

- 2.1 Virginia ACTE supports continued priority funding for CTE program expansion to promote statewide consistency in course offerings and quality. These would assist all students to prepare for entry into a competitive workforce and to be college and career ready.
- 2.2 Virginia ACTE supports increased funding to modernize and expand the capacity of CTE equipment and to teach and apply Science, Technology, Engineering, and Mathematics (STEM) initiatives and performance-based, problem-solving processes for all students.
- 2.3 Virginia ACTE supports increased funding for equipment as needed for credentialing

assessments as required by industry standards.

- 2.4 Virginia ACTE supports changing the base allocation level from \$2,000 to \$5,000 to provide an equitable base distribution of funds to each school division, especially smaller and rural school divisions. Currently only 18.22 percent of the state equipment funding is used for the base allocation and 81.78 percent of the funding for student enrollment allocation. Base allocation for regional technical centers should be defined as a base allocation per each school division participating in the secondary CTE regional center.

POLICY ISSUE 3

Virginia ACTE supports funding for the Governor's STEM Academies and Governor's Health Science Academies that prepare students for high-demand, high-wage, and high-skill careers In Virginia.

Rationale

- Research demonstrates higher levels of learning and performance when students learn essential academic skills in a relevant context and when those skills are applied to real-world settings, as they are in CTE courses and programs.
- Secondary CTE programs build upon elementary STEM experiences and integrate STEM initiatives in all career clusters by teaching performance-based and team-based learning, critical thinking, problem solving, and the design process.
- Twenty-three Governor's STEM Academies have been implemented across the Commonwealth and are designed to expand options for students to acquire STEM literacy and technical knowledge and skills while earning an industry credential.
- Nine Governor's Health Sciences Academies are now in place and represent a partnership between public school divisions, healthcare institutions, the private sector, and institutions of higher education to create rigorous programs to prepare students for careers in the health sciences.
- Equipment funding for Governor's STEM Academies and Health Science Academies comes from the state level-funded equipment budget.
- There is a need to provide reliable, sustainable, and identifiable funding streams for the Governor's STEM Academies.
- Permanent line-item funding in the governor's budget is needed to ensure that laboratories are updated to meet the needs of rapidly changing curriculum and provide a rigorous and relevant program of study based on industry needs.
- Line-item funding will incentivize school divisions to implement and sustain Governor's STEM Academies and Governor's Health Sciences Academies.
- Governor's STEM Academies, Governor's Health Sciences Academies, and other STEM initiatives, all relevant to all CTE programs, are growing.
- These academies provide options and experiences for students to acquire STEM literacy and other critical problem-solving skills, knowledge, technological literacy, performance-based instruction and assessment, and credentials that will prepare them for postsecondary education and for high-skill, high-demand, and high-wage careers in Virginia.

Virginia ACTE proposes the following recommendations to expand the integration of Virginia's CTE curriculum with the Standards of Learning and STEM initiatives:

- 3.1 Virginia policy leaders must enhance support for a performance-based educational system that incorporates the standards for career and technological literacy, authentic assessment, and the infrastructure for college and career readiness in all public schools.
- 3.2 Virginia's policy leaders must recognize CTE as an integral component of K–12 STEM initiatives and acknowledge CTE's unique ability to provide STEM instruction in secondary education in the Commonwealth.
- 3.3 The General Assembly should provide permanent line-item funding to support the Governor's STEM Academies and Governor's Health Sciences Academies.

POLICY ISSUE 4

Virginia ACTE supports adequate funding to sustain the CTE Resource Center and its work to expand college and career readiness through continued integration of secondary and postsecondary CTE curricula with Standards of Learning and through alignment with industry and professional standard certifications.

RATIONALE

The CTE Resource Center activities include:

- Developing and revising CTE curricula every three to five years with the assistance of business/industry panels and teachers.
- Hosting business/industry representatives and teacher curriculum development teams, and other meetings of the state's educational leaders.
- Providing up-to-date, Virginia Board of Education-approved information about certifications and licensure requirements for CTE teachers and students.
- Aligning CTE courses with Virginia's Standards of Learning for English, Mathematics, History and Social Sciences, Science, and Economics and Personal Finance.
- Aligning CTE courses with national and state certification standards, when available, as well as competitive standards for career and technical student organizations.
- Providing up-to-date curricula and resources free to Virginia public school teachers.
- Offering in-service meetings to teachers across the state virtually and in person at no cost to Virginia public school teachers or school divisions.
- Offering students, parents, and counselors a Web-based tool for exploring careers—through student interest in career areas or through career clusters and general academic areas of interest (e.g., algebra, anatomy, geography, physics, writing).
- Offering a lending library to Virginia teachers.
- Serving as the manager for CanDo, a Web-based competency tracking application for Virginia educators, using the state-approved competency lists and curricula.
- CTE Resource Center state funding was \$400,000 per year in 2008-2009 biennial budget.
- CTE Resource Center state funding was cut 35% in FY 2009-2010 and 38% in FY 2010-2011, leaving state funding at \$248,021.

- The General Assembly restored \$50,000 of the funding in FY 2012, with funding now at \$298,021 in the current biennial budget.

Virginia ACTE proposes the following recommendations to support college and career readiness and sustained funding for the CTE Resource Center.

- 4.1 The General Assembly should restore funding to sustain the work of the CTE Resource Center.
- 4.2 The General Assembly should provide permanent line-item funding to the CTE Resource Center.

POLICY ISSUE 5

Virginia ACTE supports increased efforts by Virginia's colleges and universities to implement and, where they already exist, strengthen undergraduate and graduate teacher preparation programs in CTE.

Rationale

Virginia continues to experience a critical shortage of qualified teachers, especially in its most challenged schools.

- Since 2003–2004, CTE has ranked among the top 10 areas of critical teacher shortages with specific program areas defined. Critical shortages were cited for 2008–2009 in Technology Education and Family and Consumer Sciences and for 2009–2010 in Technology Education and Agricultural Education. For the 2014–2015 school year, CTE as a whole ranked fourth in the top-10 list of Virginia's critical teacher shortage areas.
- Local school divisions face increasing difficulty finding qualified teachers for CTE programs, and this shortage is predicted to become more serious within the next five years. CTE administrators collectively project 613 openings within five years—more than eight times as many as in 2006–2007.

Demand for CTE teachers and programs is increasing:

- Student enrollment in CTE programs during 2014–2015 totaled 586,836—a duplicate count; that is, some students took more than one CTE course.
- The updated Workplace Readiness Skills for the Commonwealth (taught in all CTE courses and programs) are a clear priority for Virginia's employers, often valued more highly than standard academic grades or test scores.
- Teachers in four of the CTE program areas (Agricultural Education, Business and Information Technology, Family and Consumer Sciences, and Marketing) provide the largest number of instructors endorsed to effectively teach Economics and Personal Finance, a graduation requirement for Virginia students to meet the need for a financially literate citizenry.

Highly qualified CTE teachers must be available to meet increasing demand. Teacher preparation programs at the state's colleges and universities (sometimes in cooperation with Virginia's community colleges), along with selected special initiatives, offer some solutions to these shortages, but more needs to be done.

Virginia ACTE proposes the following recommendations to strengthen and expand Virginia's supply of highly qualified CTE teachers:

- 5.1 Virginia ACTE recommends that the Board of Education and the State Council of Higher Education in Virginia move support of teacher-education programs in CTE in

- Virginia’s colleges and universities to the highest priority to assure a supply of trained teachers.
- 5.2 Virginia ACTE recommends that the “career switcher” program require rigorous pedagogy instruction, realistic endorsement requirements with relevant certifications and professional experience. At the same time, the Board of Education should require sound mentoring opportunities to strengthen “career-switcher” candidates’ transitions to the classroom.
 - 5.3 Virginia ACTE recommends inclusion of integrated K–12 STEM in new and existing teacher-preparation programs in Virginia.
 - 5.4 Virginia ACTE recommends that the General Assembly increase the amount of funding available for the Virginia Teaching Scholarship Loan Program and set aside a portion of the funds specifically for CTE teacher shortage areas. In this program, recipients who teach two years in Virginia are not required to repay the loan.
 - 5.5 Virginia ACTE recommends that the State Council of Higher Education for Virginia (SCHEV) and the Virginia Community College System (VCCS) work together to endorse Teachers for Tomorrow as a dual-enrollment community college course that is eligible for transfer to teacher-education programs at four-year colleges and universities.
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Affiliated Organizations

Virginia Association of Agricultural Educators
Virginia Association of Career and Technical Education Administrators
Virginia Association of Marketing Educators
Virginia Association of Teachers of Family and Consumer Sciences
Virginia Association of Trade and Industrial Education
Virginia Association of Career and Technical Education—Special Needs Division
Virginia Business Education Association
Virginia Health and Medical Sciences Education Association
Virginia Technology and Engineering Education Association

For further information, please contact

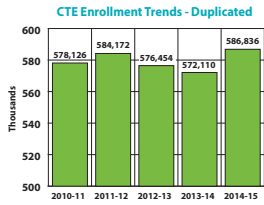
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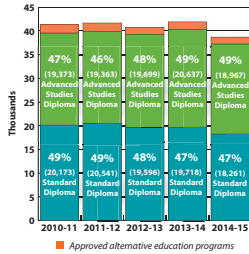
Learning that works
for Virginia

Connecting Learning to Results



In the 2014-15 school year, 280,957 middle and high school students enrolled in one or more CTE courses.

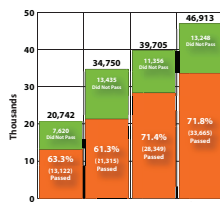
Completers Graduated with Standard and Advanced Studies Diplomas



For five consecutive years, 95% or more CTE completers graduated high school with a Standard or Advanced Diploma.

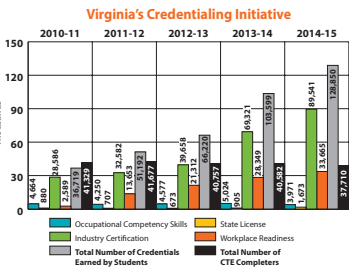
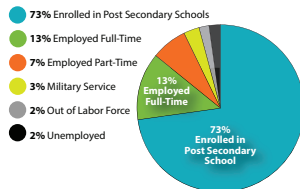
Beginning in 2013-2014, first time ninth grade students (the graduating class of 2017) are required to earn a Board-approved career and technical education credential to graduate with a Standard Diploma.

Workplace Readiness Skills for the Commonwealth Examination



Source: Career and Technical Consortium of States (82 school divisions participated in 2012, 107 in 2013, 109 in 2014, and 107 in 2015.)

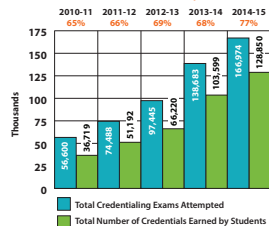
2014 Graduates One Year Later



High schools report the number of credentials earned by students for passing occupational competency assessments, state licensure examinations, industry certification examinations, and workplace readiness skills assessments.

Source: Virginia's School Report Card

Pass Rates of Exams Attempted vs Earned



Note: Totals include multiple exams attempted/earned by individual students. The cost of credentialing tests range from 105.3005 per test.

The Virginia Association for Career and Technical Education (Virginia ACTE) provides leadership in developing an educated, prepared, adaptable and competitive workforce. Members include educators, business partners, parents, administrators, and others committed to expanding opportunities for Career and Technical Education.

VISION

The Virginia ACTE is the organization that advocates for, supports, and serves all aspects of Career and Technical Education for the benefit of education and the economy in the Commonwealth of Virginia.

MISSION

The Virginia ACTE is dedicated to expanding relevant and rigorous Career and Technical Education programs, enhancing leadership among its members, and influencing public policy for the benefit of Career and Technical Education students and professionals and developing a competitive workforce in the Commonwealth of Virginia.

STRATEGIES

1. Work towards ensuring all students are college and career ready.
2. Contribute to creating and implementing state-of-the-art Career and Technical Education programs in Virginia.
3. Provide professional development and leadership opportunities for Career and Technical Education teachers and administrators.
4. Influence and support public policy initiatives that enhance and benefit Career and Technical Education in Virginia.
5. Strengthen the organization through increased active membership.
6. Inform all members of educational initiatives and national and state public policies that affect Career and Technical Education.
7. Communicate critical needs of Career and Technical Education to policymakers, parents, business and industry, students, and communities.

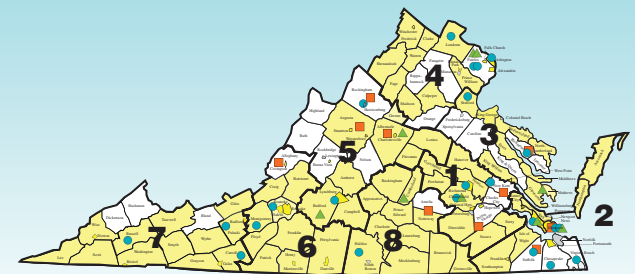
<http://www.VirginiaACTE.org>

Dr. Brenda D. Long, Executive Director
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 Jesse W. White, VP for Public Policy
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Connecting Career Preparation to the Workforce

More than **280,000** students enroll in CTE courses annually through

- 329 high schools
 - 304 middle schools
 - 47 division centers
 - 23 Governor's STEM Academies
 - 9 Governor's Health Sciences Academies
 - 10 Jointly Operated Regional CTE Centers
- and
- 99 school divisions offer CTE dual enrollment
- across the Commonwealth of Virginia.



Connecting Learning to Successful Careers



The 16 career clusters help students investigate careers and design their plan of study to advance their career goals. Within each career cluster, there are multiple career pathways that represent a common set of skills and knowledge, including academic, technical, and career readiness skills that lead to credentials necessary to pursue a full range of career opportunities from entry level to management, including technical and professional career specialties. CTE actively partners with business and industry to design and provide high quality, dynamic programs to meet current, emerging, and projected work force needs. Relevant work-based learning opportunities and leadership development offered through career and technical student organizations, are incorporated into each program.

Learn more about career clusters at



Brandy Puckett
Horticulturalist
Primland Resort
Meadows of Dan, Virginia

Agriculture, Food and Natural Resources

- Agriculture is among Virginia's largest industries, with recent studies showing an economic impact around \$70 billion.
- Agriculture and forestry together account for more than 414,700 jobs in Virginia.
- Nationally, environmental science and veterinary assistant careers are expected to grow by 18% and 41%, respectively, by 2022.



Joey Dawson
Owner and President
Dawson Custom Woodworking, Inc.
DCW Rental Properties, LLC
Rustburg, Virginia

Architecture and Construction

- The employment of architects is expected to grow by 17% between 2012 and 2022.
- Rising energy costs and environmental concerns may result in an increased demand for architects and construction workers with knowledge of green building and sustainability design.
- The construction industry is projected to account for about 222,500 jobs across Virginia by 2022.



Carlie McGuire
Reporter
WJCL News
Savannah, Georgia

Arts, Audio/Video Technology and Communications

- Employment of graphic designers in computer design and related services will grow by 35% by 2022.
- Employment of dancers and choreographers is projected to grow by 13% by 2022.
- This cluster will employ nearly 5,000 more Virginians by 2022, representing an 8% growth.



Kirsten Branch
Administrative Analyst
NTT Data Federal Services, Inc.
Vienna, Virginia

Business Management and Administration

- Business Management and Administration is the cluster employing the largest number of workers in Virginia.
- This cluster is expected to grow by 9% over the decade 2012-2022.
- This cluster employed about 846,000 Virginians in 2012 and is expected to employ over 78,000 more by 2022, for a total of nearly 925,000 workers.



Carinda Soulos
Kindergarten Teacher
Chesterbrook Elementary School
McLean, Virginia

Education and Training

- The Education & Training cluster is projected to grow to approximately 276,600 jobs across Virginia by 2022.
- Eighty-three percent of jobs will be in the Teaching and Training pathway.
- Opportunities beyond K-12 education include teaching at the college level and being an adult literacy and GED instructor.



Candice Owens
Auditor
Capital Asset Management Team
Auditor of Public Accounts
Richmond, Virginia

Finance

- Estimates predict that about 173,500 Virginians will be employed in this cluster by 2022.
- The Securities and Investments pathway is projected to see the highest growth rate through 2022, while the Accounting pathway is projected to see the highest growth in sheer numbers of new jobs—nearly 7,000 jobs—by 2022.
- Overall, the Finance cluster is expected to grow 13%.



John Henley
Acquisitions Specialist
Defense Logistics Agency
Richmond, Virginia

Government and Public Administration

- This cluster employed nearly 45,000 Virginians in 2012 and is expected to add 2,500 jobs across the Commonwealth by 2022, about a 6% growth rate.
- According to the Virginia Employment Commission, employment growth is anticipated in most of this cluster's pathways.



Cindy Umaña Amador
PT, DPT
Licensed Physical Therapist
Fox Rehabilitation and Spring Arbor Leeburg, Virginia

Health Science

- Registered nurses look forward to a projected job growth of 13% across Virginia between 2012 and 2022.
- Dentists and physical therapists will be in high demand, as baby boomers age and need more complex dental work and physical therapy.
- By 2022, Health Science opportunities are projected to grow to nearly 371,100 jobs, a 26% increase since 2012.



Nicole Sanchez
Manager, Events and Programs
Washington Wizards and Washington Mystics
Washington D.C.

Hospitality and Tourism

- This cluster, one of the largest in Virginia, will employ about 532,500 by 2022, a 14% increase over the decade.
- Virginia tourism generated approximately \$21.5 billion in revenue and supported 213,000 jobs in 2013.
- Employment of meeting, convention, and event planners is projected to grow 33% by 2022.



Victoria McGee
Assistant Teacher
The Goddard School
Virginia Beach, Virginia

Human Services

- Employment in this cluster is projected to increase by 16%, leading to about 214,100 jobs across Virginia by 2022.
- The Personal Care and Services pathway, including cosmetology, funeral services, and fitness, should have more than half of Virginia's Human Services workers by 2022.
- More than 1,000 annual job openings in community service, religion, and social work are projected through 2022.



Brian Tajo
Workday Design Manager
Johnson & Johnson
New York, New York

Information Technology

- One of the fastest growing clusters in Virginia, this cluster employed slightly more than 226,000 Virginians in 2012 and is expected to employ 283,500 in 2022.
- This cluster represents 25% growth over the decade, exceeding the anticipated national average growth of 17% among all occupations in this cluster.



Jason Knoster
Attorney
Graham Law Firm, PLLC
Leesburg, Virginia

Law, Public Safety, Corrections and Security

- About 183,400 Virginia jobs are projected for this cluster by 2022, an increase of 11%.
- Demand for emergency medical technicians and paramedics should increase by nearly 50% in Virginia by 2022.
- There is an anticipated rise in demand for occupations such as paralegals and legal assistants, court reporters, security guards, private detectives and investigators.



Cynthia Roberts
Welder
Newport News Shipbuilding
Newport News, Virginia

Manufacturing

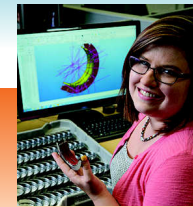
- Automation in manufacturing will drive a 20% increase in opportunities for CNC operators and programmers.
- Welding, soldering, and brazing machine setters/operators; alarm systems installers; and medical equipment repairers should see jobs increase by more than 25% by 2022.
- The Quality Assurance and Maintenance, Installation and Repair pathways are projected to employ 103,600 Virginians.



Justina Sage Sumpter
Marketing and Development Manager
United Way of Montgomery, Radford and Floyd
Christiansburg, Virginia

Marketing

- This cluster will employ nearly 469,000 Virginians by 2022, representing a 10% increase over the decade.
- Employment opportunities for market research analysts will grow by 32% to a total of nearly 131,500 new jobs by 2022.
- Advertising, promotions, and marketing manager positions are projected to grow by 12% by 2022.



Casey Bowler
Tool Designer/Detailer
Federal-Mogul Corporation
Blacksburg, Virginia

Science, Technology, Engineering and Mathematics

- Employment in the Engineering and Technology pathway is expected to increase by 11% by 2022.
- Atmospheric and space scientists, environmental scientists and specialists, geoscientists, and hydrologists can expect nearly 9,700 job opportunities in Virginia by 2022.
- Employment in STEM jobs will grow by 12% for a projected employment of 96,200 across Virginia by 2022.



Humberto Teter, II
Automotive Technician
First Team Auto Mall
Roanoke, Virginia

Transportation

- The Transportation Operations pathway is projected to employ nearly 200,000 workers across Virginia by 2022.
- The Logistics Planning and Management Services pathway should provide more than 15,600 jobs in Virginia by 2022, with demand for logisticians expected to increase by 28%.
- Formal postsecondary automotive training may help some candidates find jobs as automotive technicians and service professionals.