



### COMPLETER FOLLOW-UP

It will soon be time to begin the Follow-Up Survey of 2011 CTE Completers. Staff at the Weldon Cooper Center will manage the online process and be available to help you. The survey begins in March and a webinar explaining the survey will be held then.

CTE administrators should start planning their staff allocation for this project, but no other action is required until March. Please contact us with questions at:

[CTEcompleters@virginia.edu](mailto:CTEcompleters@virginia.edu)

Administrators can log on to see divisional results for the last survey with the same passwords used in the spring. If you no longer have your password, please call and request it.

### GET HELP FINDING DATA

Now is the time to begin planning new programs. The first step in this process is investigating employer demand. Trailblazers can help you find the official data that you need to submit with your program application.

Virginia CTE professionals can contact Trailblazers for help with data needs. Don't waste time looking for information that we can help you find easily. Just call, 434-982-5582.

### TRAILBLAZERS BLOG

There is more to say about *Trailblazers'* topics than will fit in our newsletter, so we're writing a blog now. <http://ctetrailblazers.blogspot.com/>

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Learning that works  
for Virginia

## Career Cluster Predictions: Employment Opportunities In 2018

The Center on Education and the Workforce (CEW) at Georgetown University has come out with another important report this month on how future employment opportunities will correlate with CTE Career Clusters. The report, [\*Career Clusters: Forecasting Demand for High School Through College Jobs\*](#), was compiled in conjunction with the National Research Center for Career and Technical Education and the National Association of State Directors of Career and Technical Education Consortium.

The primary motivation for the report was to give the CTE community an idea of the direction the 16 CTE Career Clusters will take over the next few years, and to provide school districts, states, and colleges with data to connect job projections to curriculum and program planning.

The report makes a number of key projections about the changing nature of employment and education. These include:

***Jobs for workers with only a high school diploma or less still exist but are quickly declining.*** Thirty-seven percent of all jobs in 2018 will be available to workers who have either a high school diploma or less, down from 72 percent in 1973. Between 2008 and 2018, projec-

*Career Clusters* is based on work published last year in [\*Help Wanted: Projections of Jobs and Education Requirements Through 2018\*](#). *Help Wanted* presented employment projections through 2018 for hundreds of occupations. It also broke out the projections for each occupation by education requirements. The new report matches each occupation to one of CTE's 16 career clusters and then analyzes the employment and education trends for each cluster.

[\*Help Wanted\*](#) explicitly challenged the methodology for projecting employment and interpreting education requirements used by the [\*U.S. Bureau of Labor Statistics\*](#). The BLS introduced a new method of analyzing education requirements last month and will release new employment projections for 2010-2020 next month. *Trailblazers* will be writing about the new BLS projections after the release.

tions show there will be around 47 million total job openings, distributed as:

- Less than high school, 4.6 million (10%);
- High school diploma but no further education, 13.1 million (27%);
- Some college/no degree, 8.4 million (18%)
- Associate’s degree, 5.7 million (12%);
- Bachelor’s degree, 11 million (23%); and
- Master’s degree or better, 4.8 million (9%) (page 60).

**A Bachelor’s degree or better offers access to all high-paying jobs within occupational clusters, but it is not a guarantor.** Occupation matters a great deal.

**Many of the larger clusters do not pay a living wage.** There is a wide distribution of wages across career clusters. The STEM cluster pays the highest wages overall, an average of \$74,000. Conversely, wages in Hospitality and Tourism averaged \$29,000 in 2008. For workers with a high school diploma or less, jobs that have family-sustaining wages can only be found in 4 of the 16 career clusters: Manufacturing; Architecture and Construction; Transportation, Distribution and Logistics; and Hospitality and Tourism.

**Preparation for certifications should be part of career-ready education.** Even where strong high school CTE programs exist, employers often require not only a high school diploma, but also an industry certification.

### Projected Job Openings in the 16 Career Clusters

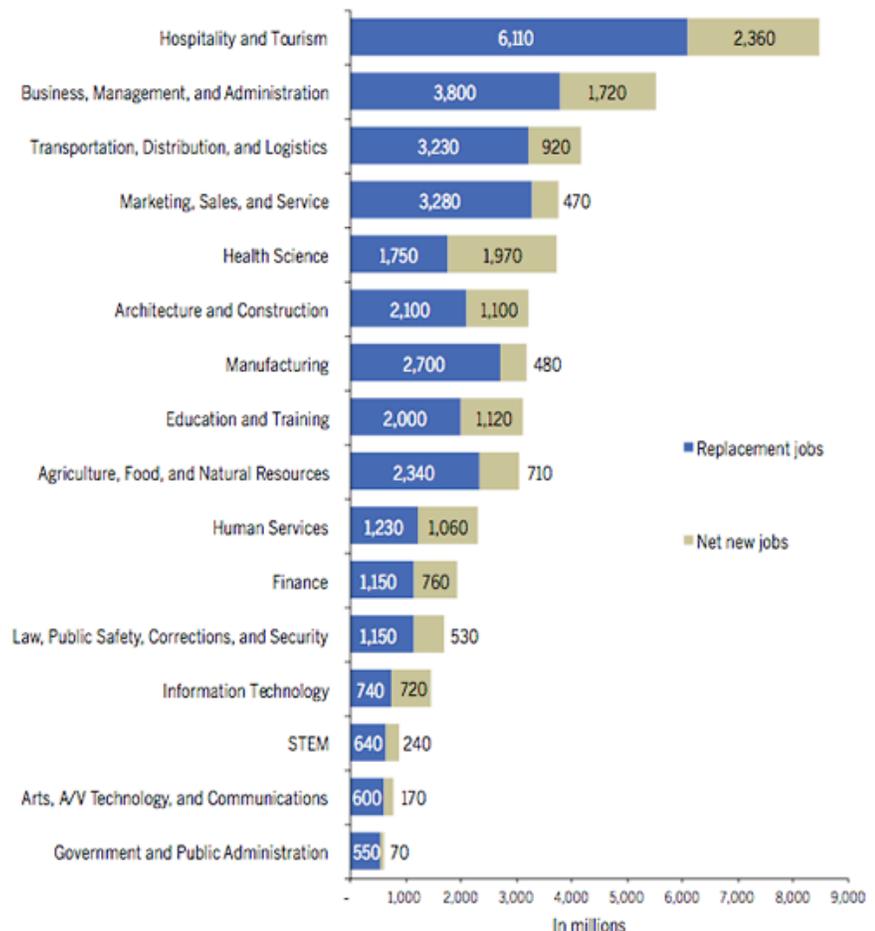
The entire report deserves close reading, but Chapter 4, "Looking Forward to 2019: Employment Projections for CTE," is particularly valuable for its discussion of job openings.

Job opportunities arise in two ways: when

new jobs are created and when existing workers leave their occupation to retire or to work in another field, thus opening a spot for a replacement worker. The table below from *Career Clusters* (page 63) shows net new jobs and replacement jobs for each career cluster.

*Hospitality and Tourism is projected to produce the most job openings nationwide — over eight million.* This cluster generates huge numbers of replacement jobs because wages are generally low, working conditions are often difficult, and many are eager to leave these occupations, thus opening up many opportunities for replacement workers. Some other clusters have much lower turnover rates, and their replacement jobs are mainly created when workers retire.

*Manufacturing continues to offer a significant number of job openings (despite layoffs and outsourcing) in order to replace its aging workforce.*



*STEM is a small cluster with relatively few new and replacement jobs* despite its importance to our economy and continued growth. While I agree with *Career Clusters* researchers that STEM is a much smaller occupational group than our current level of interest in it suggests, I believe that the crosswalk that was used to match occupations to clusters puts many occupations that we think of as STEM into other clusters. This happens because many STEM occupations naturally cross clusters. The cluster that an occupation falls into seems to be an historical accident of the development of the career cluster system. The science and engineering occupations omitted from the STEM cluster and grouped in others include Biomedical, Civil and Environmental Engineers, as well as Civil, Environmental, and Industrial Engineering Technicians. Putting those occupations back into STEM would give that cluster some additional replacement and new jobs, though I don't have the detailed job openings data to determine just how many more.

### *Forecasting Demand Cluster by Cluster*

The *Career Clusters* report concludes with a detailed nationwide forecast for each of the 16 career clusters. These include forecasts of total employment, education requirements, and information on occupations that pay living wages. These cluster-by-cluster reports begin on page 81. CTE professionals will find these cluster reports valuable and should read the reports that discuss the cluster areas in which they work.

### *Forecasting for Virginia*

In addition to analyzing national data, the *Career Clusters* authors have prepared an additional report of [summary information on each state](#). Here are the summary points for Virginia:

- In 2018, 42% of all jobs in Virginia will be found in the Marketing, Sales and Services, Business Management and Administration, and Hospitality and Tourism clusters.
  - The largest cluster—Business Management and Administration—will require substantial postsecondary education in 2018. It will grow by 19% for those with postsecondary education and 10% for those without.
  - Jobs for high school graduates and high school dropouts will grow more slowly than jobs for those with postsecondary education.
  - In Virginia by 2018, there will be about 450,000 jobs for those with certificates.
  - The table on the following page shows Virginia employment estimates for 2008 and projections for 2018.
- Marketing, Sales, and Service will be the largest cluster overall, but Information Technology will be the fastest growing. Jobs in the Information Technology sector will increase by 38% by 2018.
  - Business Management and Administration will add the most jobs in Virginia through 2018, while Manufacturing will lose jobs.

Employment Estimates and Projections for Career Clusters in Virginia				
Virginia projections by cluster	2008	2018	Difference	Percent change
Agriculture, Food, & Natural Res.	134,900	139,200	4,200	3
Architecture & Construction	328,300	355,200	26,900	8
Arts, A/V Tech, & Communications	62,400	67,400	5,000	8
Business, Mgmt & Administration	580,800	660,400	79,600	14
Education & Training	261,300	307,100	45,800	18
Finance	108,900	127,900	19,000	17
Government & Public Admin	46,700	52,000	5,300	11
Health Science	252,700	317,700	65,000	26
Hospitality & Tourism	490,700	545,100	54,400	11
Human Services	132,500	168,600	36,100	27
Information Technology	183,900	253,100	69,200	38
Law, Public Safety, Corr's & Sec.	133,400	158,300	24,900	19
Manufacturing	272,000	267,900	-4,100	-2
Marketing, Sales, & Service	601,300	676,000	74,600	12
Science, Tech., Engineering, & Math.	97,700	116,000	18,300	19
Transportation, Distrib., & Logistics	303,400	321,500	18,100	6
<b>TOTAL</b>	<b>3,991,000</b>	<b>4,533,200</b>	<b>542,200</b>	<b>14</b>
<p>* The numbers in this table are slightly different from those provided in the December 2011 Newsletter on Education Requirement for Career Clusters. This is because those estimates of total employment were created by the BLS for 2010 and do not include all the occupations covered by this CEW report. But both sets of figures tell essentially the same story about the relative employment in career clusters.</p>				

## How The Recession Affected Occupations In Virginia

Each year, the United States Bureau of Labor Statistics (BLS) estimates how many people are employed in over 500 occupations. They do this for the nation, for individual states, and for metropolitan areas. Using these reports, we're able to see how occupational employment has changed in Virginia over the last five years and how the recession has affected jobs in our state. Overall, the BLS estimates that Virginia lost about 81,000 jobs, or -2%, over this period.

### *Job Loss*

We looked at BLS data from 2006, just before the recession hit, and compared this with the most recently available estimates, those for 2010. Some occupations saw huge job losses during this period. Virginia lost about 20,000 jobs each for Cashiers and

General Office Clerks and about 13,000 jobs each for Retail Sales Persons, Laborers, and Carpenters.

The fall in jobs for carpenters and laborers is largely due to the recession and the collapse of the building industry; many of these jobs may return as the economy improves. In the other occupations, job loss may have been triggered by the recession, but also facilitated by huge advances in technology. It is unlikely that many of the jobs for cashiers, office clerks and retail sales people will return even if the rest of the economy recovers.

### *Job Growth*

Virginia also experienced job growth in a number of occupations. We added 20,000 fast food jobs as customers left higher end restaurants for cheaper ones. We added 30,000 jobs altogether for General Managers, Management Analysts, and Business Operations Specialists. We added almost 7,000 jobs for Registered Nurses; almost 12,000 for Home Health and Personal Care Aides; and another 5,000 for Information Security Analysts, Web Developers, and Network Architects. Most of these jobs will have the momentum to survive the recession and may continue to grow after it.

### *Employment -vs- Job Openings*

Note that these graphs show changes in total employment. This is an indirect and imperfect indicator of how many jobs are available. Job opportunities arise in two ways: when new jobs are created and when existing workers leave their occupation to retire or to work in another field, thus opening a spot for a replacement worker. This has a big impact in some fields. Manufacturing, for example, has seen falling total employment for decades, but continues to have job openings to replace retirees and to replace low skill workers with high skill workers.

The Center on Education and the Workforce [Career Clusters](#) report, discussed in a previous post, includes estimates of job openings. New data from the BLS is expected next month and will include national estimates of job openings for each occupation. Trailblazers will be reporting on that data when it arrives.

### *Recession's Effect on BLS Occupational Groups*

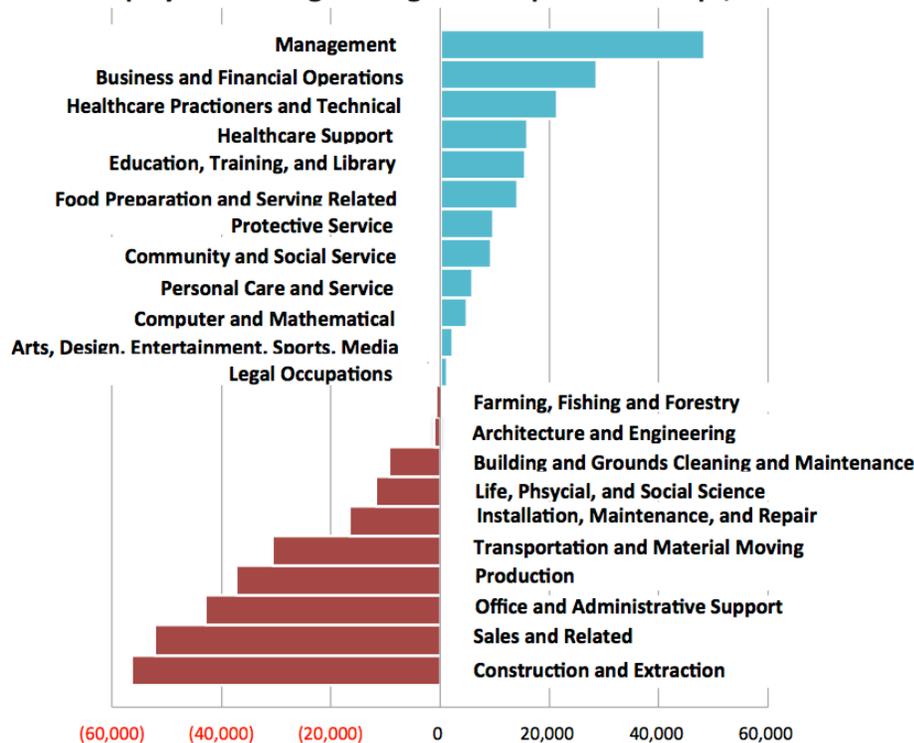
It is impossible to detail the changes in every occupation here in this post, but we can look at how the recession has changed employment in the 22 major occupational groups tracked by the BLS. We find that Management, Business, and Healthcare have seen significant employment growth since 2006, while Construction, Sales, and Office and Administrative Support have seen a significant loss in jobs. Construction was hit especially hard, with over 55,000 construction jobs disappearing from Virginia during these five years. The graph on the following page illustrates these changes.

### Recession's Effect on Career Clusters

In addition to using the BLS data to estimate change in employment by occupational groups, we can also use their data to generate estimates of employment change in CTE's 16 nationally recognized Career Clusters. We recently wrote a post about a report by the Center for Education and the Workforce (CEW) at Georgetown University called Career Clusters, which gives employment projections for the 16 Career Clusters over the next 8 years. Using these BLS estimates, we have taken a retrospective look at how the same Career Clusters have changed in Virginia since 2006. Using the method of matching occupations to clusters published in the Career Clusters report, we were able to create the graph to the right, Employment Change in Virginia Career Clusters, 2006-10..

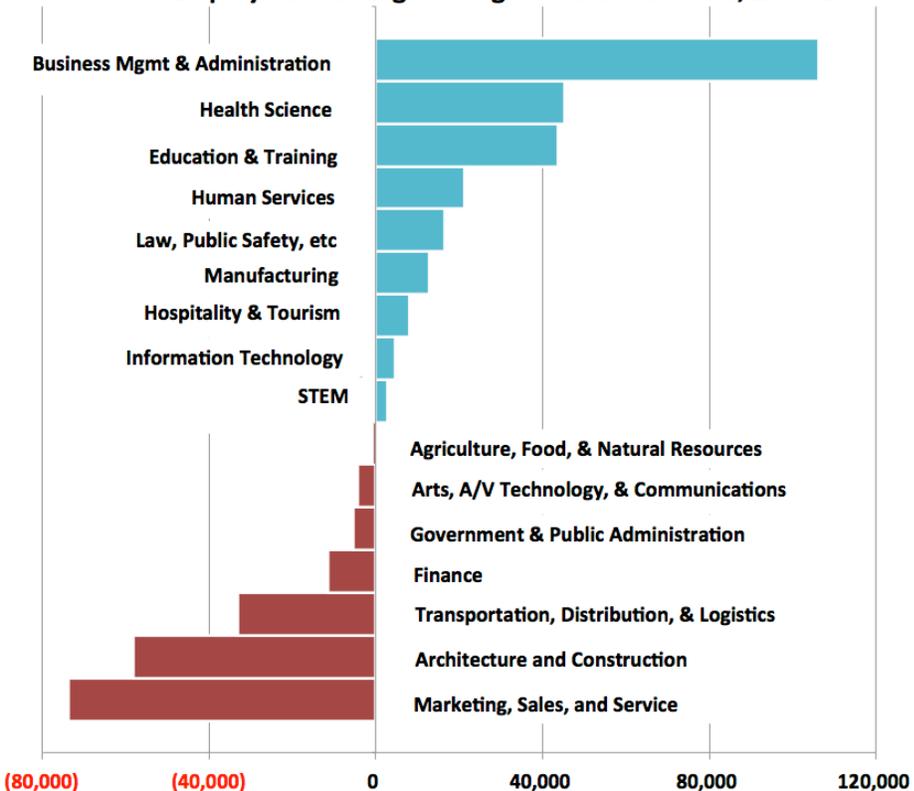
Employment change for Career Clusters looks very similar to the change that took place in occupational groups. Business Management & Administration, Health Science, and Education have seen employment growth. Marketing, Sales, and Service; Architecture and Construction; and Transportation, Distribution, & Logistics have seen employment losses.

Employment Change in Virginia Occupational Groups, 2006-10



### STEM Cluster

Employment Change in Virginia Career Clusters, 2006-10



The chart below shows a small increase in the number of jobs in the STEM cluster. As we wrote in the previous article, however, the occupation-cluster crosswalk used by the CEW and most other researchers puts many occupations typically thought of as STEM into other clusters.

The following occupations were omitted from the STEM Cluster and instead dispersed among others:

- Biomedical Engineers
- Environmental Engineers
- Environmental Engineering Technicians
- Civil Engineers
- Civil Engineering Technicians
- Industrial Engineering Technicians

We thought it would be interesting to move these occupations back into STEM to see how that would affect employment change in this field. As the graph below shows, relocating these six occupations gives the STEM cluster significantly more job growth, without having a large impact on the other clusters. Nonetheless, STEM growth remains small relative to the three major clusters: Business, Health and Education.

