



# The Changing Manufacturing Workforce in the Shenandoah Valley 2016 Update



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## Executive Summary

Following the 2013 report “The Changing Manufacturing Workforce in the Shenandoah Valley” completed by Chmura Economics & Analytics, there is anecdotal evidence that employers in the Shenandoah Valley region remain concerned about various workforce issues. These issues include impending retirements in an aging workforce and the upskilling of workers due to technological advances, with associated changes in processes and practices. Chmura was retained to help the Shenandoah Valley Workforce Development Board (SVWDB) collect and analyze primary and secondary data on regional manufacturing employers’ workforce concerns and needs, including those employers who partnered with the SVWDB in the H-1B Technical Skills Training Grant program (April 2012-March 2017).

The Shenandoah Valley region’s population grew at a relatively slower pace than the rate in Virginia and the United States, and employment in the region has still not fully recovered to its pre-recession peak. The largest major occupation group in the Valley is office and administrative support with 31,554 workers, followed by sales and related employment (23,235), food preparation and serving related (21,500), and production workers (21,325).

The percentage of residents with only a high school education is higher in the Valley (35.6%) when compared with the state (23.9%) and the nation (26.5%). On average, occupations requiring a bachelor’s degree or above have ten-year forecast growth rates that are 0.4 percentage points higher than those occupations typically requiring a high school education. In addition, occupations that typically require a bachelor’s degree or higher have lower unemployment rates than those requiring a high school education.

As of the third quarter of 2016, there were 32,366 workers employed in the region’s manufacturing sector, accounting for 13.8% of employment and making manufacturing the largest sector across the Valley and in all three sub-regions—Northern, Central, and Southern.

The myth that the manufacturing sector employs predominately low-wage workers is persistent, but data for the Shenandoah Valley indicate that wages in manufacturing are considerably higher than regional averages. Average wages for manufacturing workers in the Valley are \$50,366, exceeding the regional average by more than \$11,000. Manufacturing also has higher-than-average overall wages in all three sub-regions. Manufacturing sectors paying relatively higher annual wages are chemical (\$71,005), petroleum and coal products (\$61,727), and plastics and rubber products manufacturing (\$60,142). Overall industry employment has increased 2.3% over the past year, faster than the 1.7% increase in total regional employment.

Job losses based on the Worker Adjustment and Retraining Notification Act (WARN) identify the industries and regions that have suffered the most between 2010 and 2016. WARN notices in manufacturing over this period were limited to four companies in three counties. In contrast, between January 2010 and December 2016, the Virginia Economic Development Partnership (VEDP) announced 97 economic development projects in the region that generated 3,657 jobs and resulted in \$1.03 billion in new capital investment. Of the total number of announced projects, 70 (or 72%) have been in manufacturing (9 companies made more than one project announcement during this period). Of total new jobs created, 2,829 (or 77%) have been in the manufacturing industry.

Data on drivers of potential gaps are identified from analysis of secondary data compiled by Chmura and from JobsEQ®. Two focus groups were held to validate preliminary data and glean further context and specifics about conditions in the region. The focus groups were held in Verona, Virginia on November 29, 2016, and in Winchester, Virginia on December 1, 2016. Insights from the focus groups helped craft an online survey of manufacturers, sent via email by the SVWDB to about 264 recipients, including all H-1B OJT grant employer sponsors, between December 12 and December 28. The complete responses speak for 77 unique companies, representing 14% of the Valley region’s 560 covered manufacturing establishments. As many of the surveyed firms are large employers, these survey results represent 64% of manufacturing employment in the region.

Several national and regional trends support potential current and future supply gaps for manufacturing occupations and related skills in the Shenandoah Valley. Retiring workers from the baby boomer generation are impacting many industries, but the manufacturing workforce in particular has been aging and may face significant shortages in the near future due to retirements.

Another hiring trend impacting the region is the increasing difficulty businesses face finding workers in an environment of lower unemployment and flat labor force growth. Additionally, job-to-job flow data are consistent with concerns expressed in the focus groups and in the survey. Finding new workers is difficult, and often employers trade the same workers between themselves. When discussing recruiting in a low-unemployment environment and how these factors influence labor force availability, one focus group participant said “it’s a perfect storm, the worst recruiting environment.”

The new machines and robotics that have supported productivity gains also require greater skill to program, maintain, and troubleshoot—creating a potential gap for these higher skilled occupations. As stated by a focus group participant, “technology helps the machine operator but hurts maintenance.” A few focus group respondents also suggested that because they have to offer higher wages to attract workers, they require more skills of their employees, and that the difficulty in finding people is driving automation.

To identify occupations relevant to the manufacturing sector in the Shenandoah Valley, Chmura uses a test of significance and dominance. Occupations that account for a substantial share of total employment (1% or greater) in the manufacturing sector are considered significant, while if 20% or greater of an occupation’s total employment is in the manufacturing sector, it is considered dominant. Among the 171 detailed occupations meeting these criteria, the largest are team assemblers, with current employment of 1,542; packaging and filling machine operators and tenders (1,191); and first-line supervisors of production and operating workers (1,168).

Job openings identify immediate skill needs (and potential gaps) for employers, as well as opportunities for job seekers. At the top of the list is heavy and tractor-trailer truck drivers with 272 openings, followed by laborers and freight, stock, and material movers, hand (222). Although many of the jobs typically require relatively less education, they also typically require some degree of on-the-job training. Five occupations require long-term OJT, including maintenance and repair workers, general; industrial machinery mechanics; and bakers.

Among manufacturing occupations at the detailed level in the Shenandoah Valley, the largest projected demand/potential shortfalls over the next five years are for packaging and filling machine operators and tenders, with total demand of 210 over this period. Notable for typically requiring long-term on-the-job training are industrial machinery mechanics (107 needed over five years), maintenance and repair workers, general (66), and machinists (62).

The responses from focus group participants and survey respondents indicate gaps exist, and employers are taking steps to close these gaps. In particular, the primary data collected confirmed both the difficulty of hiring workers from within the region, and the current practices to attract and hire from outside the Shenandoah Valley. Along with the availability of workers, the survey also confirmed some of employers’ most pressing concerns are around the pipeline of younger workers and impending retirements. The most prominent workforce concern was that people applying for jobs lack basic work skills. Over half of the respondents stated a lack of interest by younger workers and a lack of mechanical skills among new hires as prominent workforce issues. Some workforce concerns, including hiring from outside the Valley and rising employee costs, varied by industry and region.

The survey also captured concerns about hiring for specific occupations. Of all respondents, 62% classified maintenance technician and 46% classified electrician as two of the hardest-to-fill occupations. Respondents shared similar concerns about retirements over several occupations. The most common answer was maintenance technicians, with 40% of respondents concerned about retirements from this occupation. Apprehension over retirements at the supervisory and management levels are fairly high, at 20% of respondents. Respondents also shared concerns about electricians (19%), machine operators (14%), and machinists (12%) over the next five years.

In terms of in-demand certifications and skills, the most requested certification by far in online job ads for manufacturing occupations in the Shenandoah Valley is a commercial driver's license (CDL). Survey results also indicated credentials are needed for truck drivers, welders, and computer controlled machine tool programmers.

With context provided from focus group participants, survey results suggest that while certifications are required for many occupations, in the current hiring environment, certifications may be more of a differentiating factor than absolute requirement for hard-to-fill occupations. The only difficult-to-fill occupations with more than 50% of respondents indicating a requirement for a certification or credential are truck drivers (58%) and welders (55%). More than 40% of respondents who selected computer controlled machine tool programmers (47%), electricians (41%), and tool and die makers (41%) as difficult-to-fill occupations also indicated that they require a related credential or certification. In the survey results, there does not appear to be a correlation between hard-to-fill occupations and a certification requirement for those occupations.

In contrast to certifications and credentials, the lack of basic work skills and work readiness were emphasized as difficult to find. These soft skills are significant workforce issues for survey respondents. As was true for difficult-to-fill occupations, in-demand skills vary somewhat across industries and regions.

Despite the expressed current and potential gaps in occupations and skills for manufacturing respondents in the Shenandoah Valley, upskilling workers was among the least pressing concerns for survey respondents. When asked to name the most pressing workforce concerns of their businesses, 34% chose upskilling workers by skills transfer, and 28% selected upskilling workers through a formal training program.

To assure skills transfer within their organizations, on-the-job training is almost universally used by respondents' firms. Standard operating procedures (70%), cross training (69%), and internal training programs (66%) are used in at least two-thirds of respondents' companies. More than half (51%) of respondents rely on tribal knowledge as a method for skills transfer inside their organization. The reliance on tribal knowledge, and the associated risks, presents an opportunity for the SVWDB to share best practices in transferring skills.

Regarding possible improvements in workforce development, the principal themes heard from employers are better promotion of technical careers—especially to young people—and improving training and education. In a separate question, employment and training providers were grouped into three categories: K-12 schools, technical centers, and community colleges. Respondents were similarly satisfied across all providers, with about half indicating the provider is meeting their firms' needs. Additional technical and soft skill training was emphasized as lacking in K-12 schools, while additional resources for technical training and transferrable skills were suggested for secondary schools. Comments on improvements for technical schools and community colleges ranged from a need for technical and work-readiness skills in graduates to additional occupational-specific training. However, multiple focus group participants also emphasized productive relationships with community colleges in their region.

Evident throughout the focus group and survey results is support that manufacturers in the Shenandoah Valley region currently face national, state, and regional trends driving gaps in skills and occupations. There is also potential for significant gaps over the next five years. Results from this updated study should serve as another step in a continuing process of evaluating employer needs and ensuring preparation of a ready workforce in the region to support continued economic prosperity.



*The Changing Manufacturing Workforce in the Shenandoah Valley 2016 Update was prepared for the Shenandoah Valley Workforce Development Board by Chmura Economics and Analytics.*

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