



Manufacturing Sector Employment Trends in the Richmond MSA

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Key Findings

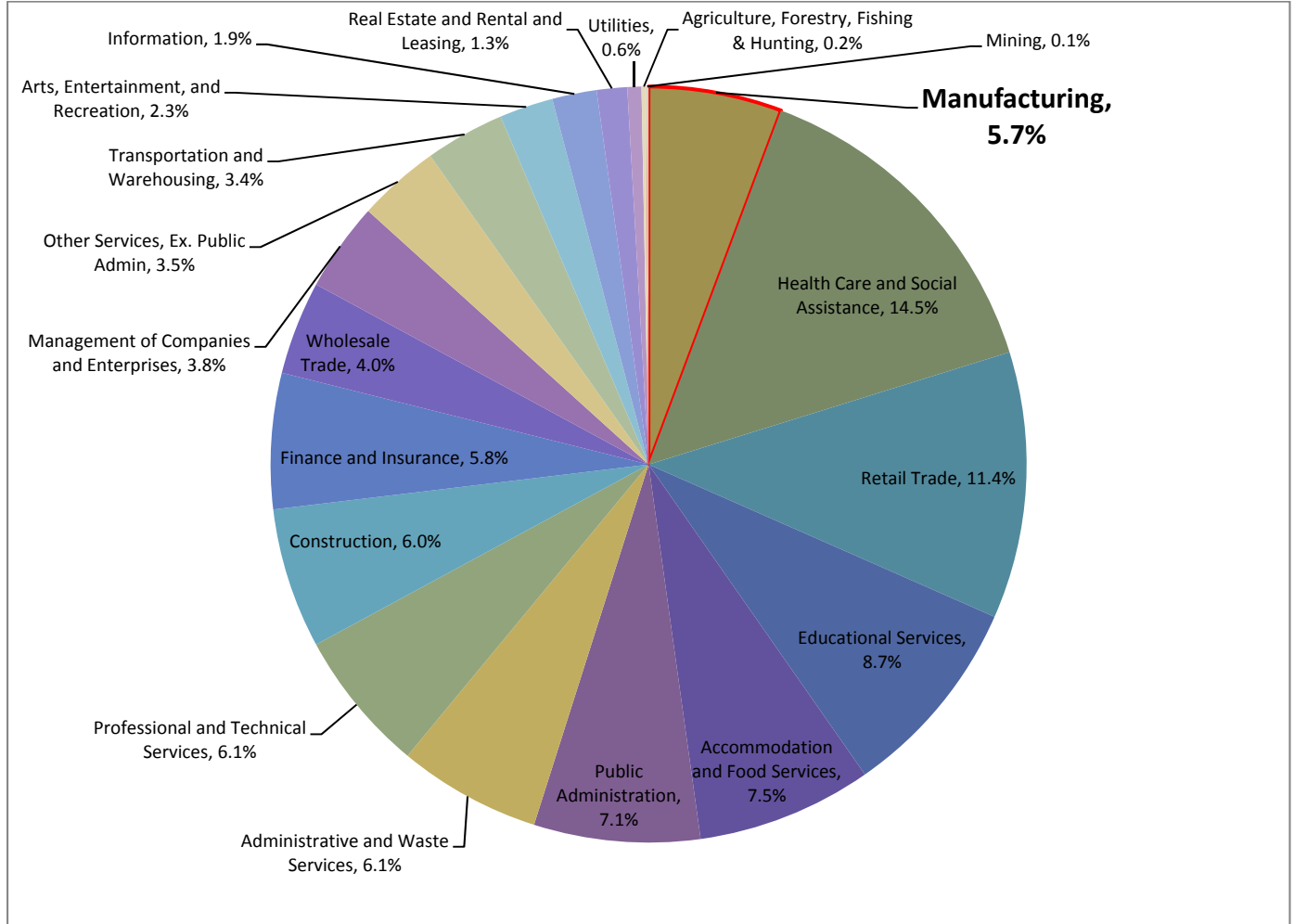
Though not the largest sector in Greater Richmond's economy, manufacturing continues to be an important source of employment. This report finds that:

- ✓ The manufacturing sector makes up about five percent of total employment in the Richmond MSA with about 33,000 workers.
- ✓ Manufacturing jobs are particularly susceptible to downturns in the overall economy.
- ✓ Opportunities are available for workers of all skill levels. However, manufacturers continue to replace low-skill workers with automation, creating greater demand for workers who are able to perform more complex tasks.
- ✓ Thousands of manufacturing employers exist in the Richmond MSA, producing a wide variety of products.
- ✓ The mean manufacturing wage is above the mean for all sectors. Wages for low-skilled workers are above average when compared to similar jobs in other sectors.
- ✓ Greater Richmond is projected to lose manufacturing jobs over the next ten years at an average annual rate of 1.2 percent; it would therefore be prudent to work closely with employers when training workforce.
- ✓ The workforce is aging in some manufacturing industries, but young people are not typically drawn to manufacturing careers.

Current Employment

The manufacturing sector is not the largest sector by employment in the Richmond MSA, but does employ almost 33,000 workers according to the U.S. Bureau of Labor Market Statistics. The sector represents more than five percent of the region’s total workforce.

Figure 1: Distribution of Employment by Industry Sector, Richmond, VA MSA



Source: Labor Market Statistics, Quarterly Census of Employment and Wages Program, 3rd Quarter 2010

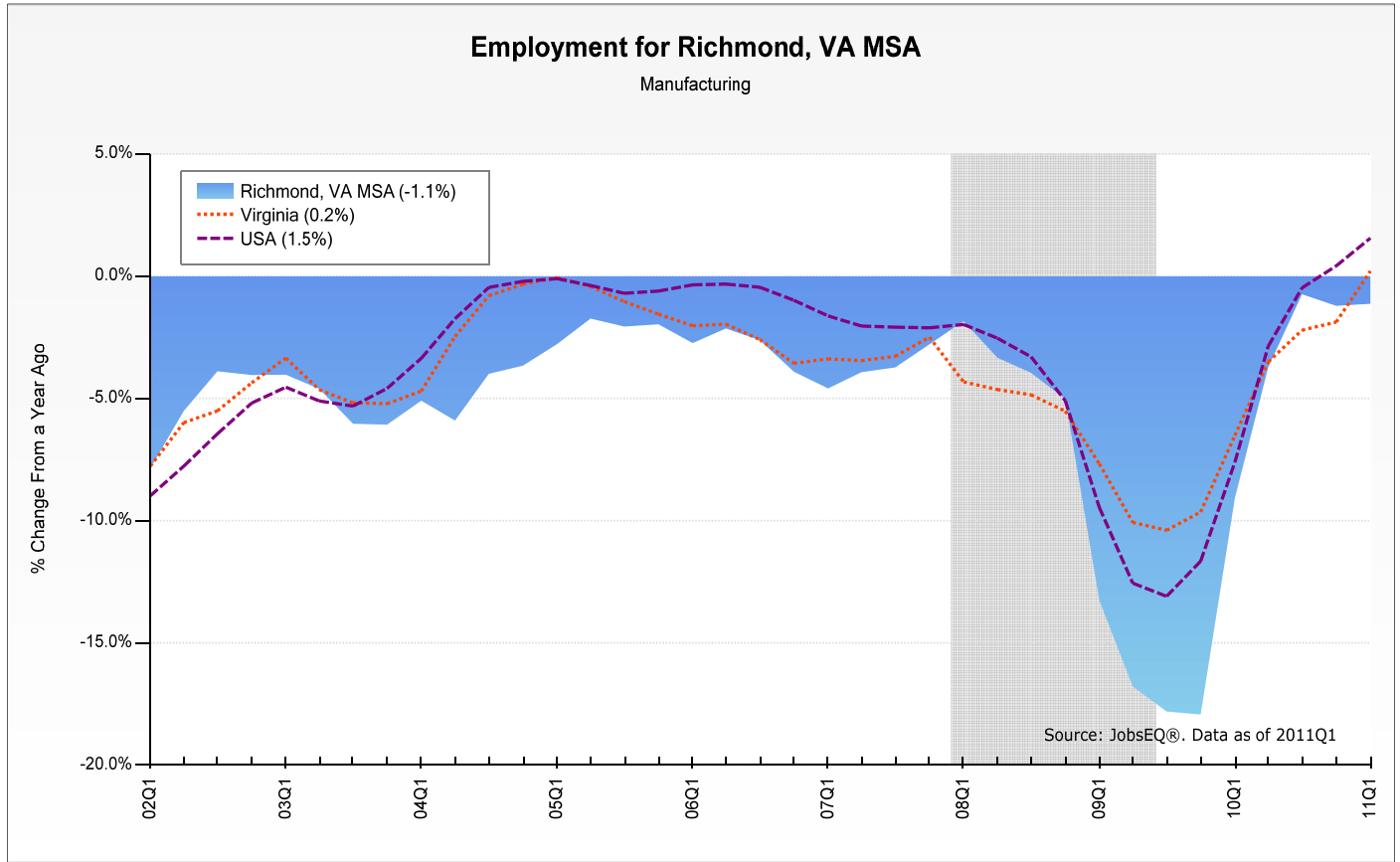
As the economy recovers from the Great Recession, hiring has increased overall as compared to levels in 2009. The Virginia Employment Commission reports a 115 percent growth in the number of online advertised job openings between May 2009 and May 2011 in the Richmond MSA. In that same time period, the number of advertised jobs in the manufacturing sector increased by 167 percent. However, despite strong growth after the recession, manufacturing jobs do not make up a significant number of overall advertised jobs. As of May 2011 there were 1,011 advertised job openings online in the manufacturing sector. These positions represent just two percent of the total advertised job openings online during this same period.

Vulnerability to Recessions

Because the manufacturing sector is tied directly to demand for durable and non-durable goods, employment is greatly influenced by overall economic trends. The relatively strong post-recession increase in the number of advertised positions described above may be viewed as a positive indicator for the future of the sector in Greater Richmond. However, the decline in job openings during the recession reflects the vulnerability of manufacturing positions to the natural peaks and valleys of the overall economy.

The chart below shows manufacturing employment growth in the Richmond MSA between 2002 and 2011. The recent recession is shaded in gray. Employment is declining in general, but losses were particularly steep during and directly after the Great Recession.

Figure 2: Manufacturing Employment Growth between 1Q2002 and 1Q2011



Industry Occupations and Required Training

The manufacturing sector offers many different occupations, including opportunities for low-, medium-, and high-skill workers.

Industries such as Food Manufacturing offer assembly line positions and other occupations that require only a high school diploma and some short-term, on-the-job training. However, as manufacturers

continue to replace low-skilled workers with automation, these positions could be vulnerable to future advances in technology.

Advanced manufacturing industries such as Chemical Manufacturing or Machinery Manufacturing require more skilled employees that are able to perform complex tasks such as operating sophisticated computerized machinery and following complex blueprints. These workers need good basic math skills as well as additional training beyond the high school level. Depending on the demands of the particular position, workers may hold a pertinent certificate or associate's degree.

Finally, many sophisticated manufacturing operations, and especially the R&D functions often attached to them, require highly skilled workers with Bachelor's or advanced degrees in a variety of sciences such as engineering, physics, chemistry, biology, and more.

Employers

There are many manufacturing employers in the Richmond MSA. Though only six manufacturing companies are represented among Greater Richmond's top 50 private employers, according to Hoovers there are over 2,700 manufacturers in the Richmond region.

Table 1: Top Manufacturing Employers, Richmond, VA MSA

Employer Name	Product	Richmond MSA Employment	Richmond MSA Job Openings
Altria*	Cigarettes	4,387	0
DuPont	Chemicals/fibers	2,785	22
Honeywell International, Inc.	Polymers	1,244	19
Tyson Foods, Inc.	Poultry products	900	0
Alstom Power, Inc.	Turbines and generators	800	22
Kraft Foods Inc.	Food products	570	8

Sources: The Greater Richmond Partnership and online job listings as of June 17, 2011

*Altria is headquartered in Greater Richmond. As such, a significant portion of Altria's jobs are not manufacturing occupations.

Chemical Manufacturing is by far the largest employer within the manufacturing sector, making up almost 20 percent of total manufacturing employment in Greater Richmond. However, there are several other manufacturing industries with a significant presence. Manufactured products include processed foods, tobacco products, paper and packaging, chemicals, fibers, turbines, industrial pumps, medical supplies, building supplies, machinery, drinking straws, and much more.

Table 2: Top Manufacturing Industries by Employment in the Richmond MSA

Manufacturing Industry	Total Employees	Percent
Chemical Manufacturing	6,239	19.26%
Paper Manufacturing	3,079	9.50%
Fabricated Metal Production Manufacturing	2,898	8.94%
Machinery Manufacturing	2,680	8.27%
Food Manufacturing	2,414	7.45%
Plastics and Rubber Products Manufacturing	2,177	6.40%

Source: JobsEQ®, data as of 2011Q1

Wages

The average annual wage for employees in the manufacturing sector in the Richmond MSA is \$61,977 (JobsEQ, 2011Q1). This is significantly higher than the average annual wage of all industry sectors, which is \$45,688. However, production occupation wages can vary widely depending on training, education, and experience.

The mean hourly wage for most production occupations ranges from \$12 to \$20 an hour. First line supervisors earn more at \$27.23 an hour. Those with the skills necessary to operate high-tech manufacturing machinery earn more than their lower skilled counterparts, taking home \$15 to \$20 per hour. Lower skilled workers perform more general assembly duties and earn between \$10 and \$13 per hour on average. Even at the lower end of average earnings, production occupation wages are generally higher than those in other occupations opened to lower skilled workers such as retail or home health care.

Table 3: Selected Wages in Production Occupations, Richmond, VA MSA

Production Occupation	Mean Hourly Wage
First-Line Supervisors of Production and Operating Workers	\$27.23
Electrical and Electronic Equipment Assemblers	\$14.68
Team Assemblers	\$13.19
General Assemblers and Fabricators	\$12.85
Food Batchmakers	\$10.61
Computer-Controlled Machine Tool Operators, Metal and Plastic	\$16.90
Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	\$16.43
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	\$16.94
Machinists	\$19.51
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and	\$20.63

Production Occupation	Mean Hourly Wage
Plastic	
Tool and Die Makers	\$17.03
Welders, Cutters, Solderers, and Brazers	\$16.28
Inspectors, Testers, Sorters, Samplers, and Weighers	\$17.16
Helpers	\$11.28
Paper Goods Machine Setters, Operators, and Tenders	\$16.71
Packaging and Filling Machine Operators and Tenders	\$10.08
Water and Wastewater Treatment Plant and System Operators	\$19.77

Source: Bureau of Labor Statistics, May 2010

Engineers work closely with manufacturers. Mean hourly wages for engineers are high, between \$36 and \$40 an hour. However, these jobs typically demand a high level of education with a bachelor’s or master’s degree generally being required. Engineering technicians earn less than engineers but require less training and post-secondary education. An associate’s degree is generally sufficient for these positions.

Table 4: Selected Wages in Engineering Occupations, Richmond, VA MSA

Engineering Occupation	Mean Hourly Wage
Biomedical Engineers	\$39.76
Chemical Engineers	\$39.59
Electrical Engineers	\$38.93
Health and Safety Engineers	\$36.94
Industrial Engineers	\$37.84
Mechanical Engineers	\$36.45
Electrical and Electronics Engineering Technicians	\$27.15
Industrial Engineering Technicians	\$22.59
Mechanical Engineering Technicians	\$26.37

Source: Bureau of Labor Statistics, May 2010

Historical and Projected Employment Growth

The manufacturing sector in the Richmond MSA has experienced below-average growth over the past five years. In this time period, more than 12,000 manufacturing positions were lost for a decline of 6.2 percent. In comparison, employment in all industries has declined by more than 16,000 positions, or 0.6 percent.

Future projections indicate that demand for manufacturing workers in the Richmond MSA will continue to decline. Employment in the sector is projected to decrease by an average of 1.2 percent annually over the next ten years, resulting in the loss of more than 3,700 jobs in that time period. In contrast, total employment for all sectors is projected to increase by an average of 1.2 percent annually. Low employment projections are linked to a continued increase in productivity resulting from process innovations which allow fewer workers of a higher skill level to complete more work with the aid of advanced machinery.

Table 5: Historic and Projected Employment Change

Industry Sector	Total Employment Change 2006q1-2011q1	Average Annual Percent Change in Employment 2006q1-2011q1	Projected Change in Employment 2011q1-2021q1	Projected Avg. Annual Percent Change in Employment 2011q1-2021q1
Manufacturing	-12,236	-6.2%	-3,755	-1.2%
All Industry Sectors	-16,713	-0.6%	72,964	1.2%

Source: JobsEQ®

Overall, production occupation growth is projected to remain stagnant. Over the next ten years, almost all production occupations are projected to grow below the regional average of 1.2 percent annually for all occupations. In fact, 58 occupations out of 110 are projected to have negative growth during this time period. Only nine occupations are projected to grow at or above the regional annual average (JobsEQ, 2011Q1).

Among those occupations with growing employment, only three are projected to create 30 or more jobs over the next ten years: General Assemblers and Fabricators with 89 projected new jobs, Food Batchmakers with 30 projected new jobs, and Water and Liquid Waste Treatment Plant and System Operators with 92 projected new jobs.

With such anemic growth projections, any manufacturing workforce training programs offered should be closely connected to employers to ensure that participants have reasonable employment prospects once training is completed.

Table 6: Projected Employment Growth, Production Occupations

Occupation	Employment Four Quarters Ending with 2011q1	Avg. Annual Percentage Change in Employment 2006q1-2011q1	Projected Avg. Annual Percent Change in Employment 2011q1-2021q1
First-Line Supervisors of Production and Operating Workers	1,996	-4.4%	0.3%
Electrical and Electronic Equipment Assemblers	221	-15.4%	0.1%
Team Assemblers	2,711	-4.5%	0.4%
General Assemblers and Fabricators	680	-3.5%	1.2%
Food Batchmakers	200	-2.5%	1.4%
Computer-Controlled Machine Tool Operators, Metal and Plastic	195	-5.6%	0.8%
Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	328	-6.8%	-0.5%
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	539	-4.5%	-1.1%
Machinists	731	-3.6%	0.1%
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	343	-8.3%	-0.2%
Tool and Die Makers	99	-5.4%	-0.6%
Welders, Cutters, Solderers, and Brazers	1,004	-1.4%	0.3%
Inspectors, Testers, Sorters, Samplers, and Weighers	1,238	-4.5%	0.2%
Helpers	1,544	-4.7%	0.2%
Paper Goods Machine Setters, Operators, and Tenders	607	-5.5%	-2.5%
Packaging and Filling Machine Operators and Tenders	1,372	-4.4%	-0.3%
Water and Liquid Waste Treatment Plant and Systems Operators	438	0.7%	1.9%

Source: JobsEQ®

Projected growth of engineering occupations is notably higher than those of production occupations. The vast majority of engineering occupations have a positive average annual projected growth rate over the next ten years and several growth rates are above the overall regional annual average for the same time period.

Table 7: Projected Employment Growth, Engineering Occupations

Occupation	Employment Four Quarters Ending with 2011q1	Avg. Annual Percentage Change in Employment 2006q1-2011q1	Projected Avg. Annual Percent Change in Employment 2011q1-2021q1
Biomedical Engineers	48	0.4%	5.8%
Chemical Engineers	183	-1.8%	-0.6%
Electrical Engineers	487	-2.1%	0.9%
Health and Safety Engineers	118	-1.7%	0.9%
Industrial Engineers	522	-4.5%	1.9%
Mechanical Engineers	699	-1.7%	1.3%
Electrical and Electronics Engineering Technicians	500	-3.3%	0.6%
Industrial Engineering Technicians	182	-4.9%	1.4%
Mechanical Engineering Technicians	133	-2.1%	0.5%

Source: JobsEQ®

Aging Workforce

Despite overall negative growth projections in manufacturing employment, there are opportunities for younger workers to enter the sector. The manufacturing workforce is aging in many industries and few young people are trained and ready to replace retirees. The ratio between young workers (ages 25 to 34) and mature workers (ages 55 to 64) is particularly notable in the Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments industry; the Paint, Coating, and Adhesive Manufacturing industry; and the Basic Chemicals Manufacturing industry. The Chemical Manufacturing industry makes up about 20 percent of all manufacturing employment in the Richmond MSA, so a largely aging workforce with few younger workers is especially concerning.

Though there may be opportunity within industries like Chemical Manufacturing for younger workers, providing training programs may not be enough to fill these positions. As a whole, a career in the manufacturing sector is considered by many to be undesirable. The sector has a reputation for layoffs, moving jobs overseas, paying low wages, and providing monotonous work with few opportunities for advancement. This description may have been accurate in the 1980's, but hardly describe most manufacturing positions available today. In reality, those operations that could be moved overseas have already been moved. Today, advanced manufacturing operations require skilled workers to perform

complex tasks for above-average compensation. However, with such a negative perception of the sector, available training opportunities will not likely be enough to attract young people to manufacturing careers; the stigma of manufacturing careers will have to be addressed first.

Table 8: Ratio between Young and Mature Manufacturing Workers, Richmond MSA

Industry Title	Ratio, employees 25-34 to 55-64
Semiconductor and Other Electronic Components Manufacturing	1.13
Navigational, Measuring, Electromedical, and Ctrl Instruments Manufacturing	1.92
Water, Sewage and Other Systems	1.04
Basic Chemicals Manufacturing	0.31
Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	0.25
Electrical Equipment Manufacturing	1.29
Paint, Coating, and Adhesive Manufacturing	0.50
Plastics Production Manufacturing	0.81

Source: U.S. Census Bureau, Quarterly Workforce Indicators

Note: Data taken from Market Street Services, Target Profiles, June 3, 2011.