

SVWDA State of the Workforce Report – 2017



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Report prepared by



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Executive Summary

In support of on-going strategic planning efforts in the Shenandoah Valley Workforce Development Area (SVWDA), this report provides an assessment of the region's state of the workforce.

The principal findings from that assessment are as follows:

1) SVWDA has enjoyed steadily rising employment over the last five years:

- Total employment increased by 11,972 jobs between the second quarter of 2011 and the second quarter of 2016, or 5.8 percent.
- Almost all of that growth was driven by the private sector. More specifically, the largest increases in private sector employment over this period occurred in the *Health Care and Social Assistance* (up 2,513 jobs), *Transportation and Warehousing* (up 2,217 jobs), and *Accommodation and Food Services* (up 1,889 jobs) sectors.

2) SVWDA remains heavily dependent on *Manufacturing*, but is experiencing significant employment and wage growth in other sectors.

- Manufacturing is the region's largest employment sector. It accounted for 31,718 private sector jobs in the second quarter of 2016 and was the region's 5th highest paying employment sector.
- Several subsectors within the region's *Manufacturing* sector (e.g., *Petroleum and Coal Products Manufacturing*; *Nonmetallic Mineral Product Manufacturing*; *Electrical Equipment, Appliance, and Component Manufacturing*; *Food Manufacturing*, and *Paper Manufacturing*) are high growth industries in terms of employment and/or wages, have disproportionately large employment and establishment footprints within the region, and are very significant export industries.
- SVWDA's *Transportation and Warehousing* sector is high growth industry in terms of both employment and wages, has a disproportionately large employment and establishment footprint within the region, and is one of the region's significant export industries.
- The majority of subsectors in the region's *Transportation and Warehousing* sector (e.g., *Couriers and Messengers*, *Pipeline Transportation*, *Support Activities for Transportation, Transit and Ground Passenger Transportation*, and *Warehousing and Storage*) qualify as high growth industries in terms of employment and/or wages,

have disproportionately large employment and establishment footprints within the region, and in some cases are among the region's most significant export industries.

- All subsectors in SVWDA's *Health Care* sector (*i.e., Nursing and Residential Care Facilities, Hospitals, and Ambulatory Health Care Services*) qualify as high growth industries in terms of employment and/or wages.

3) SVWDA faces potential gaps in its pipeline of trained workers:

- Our assessment of potential gaps between the occupation-driven demand for graduates in SVWDA, and the pipeline of graduates from regional postsecondary education institutions, has shown that there are potential shortfalls of trained workers in the following occupations: Nursing Assistants; Teacher Assistants; Industrial Machinery Mechanics; Licensed Practical and Licensed Vocational Nurses; Medical Assistants; Electricians; Child Care Workers; First-Line Supervisors of Construction Trades and Extraction; Dental Assistants; and Real Estate Sales Agents.

4) SVWDA faces demographic challenges in terms of an aging population:

- Overall population growth in SVWDA between 2000 and 2015 was comparable to the statewide norm.
- Just as at the statewide level, however, that population growth was driven by increases the region's 65 and older population. Moreover, in SVWDA that population shift was further exacerbated by absolute losses in the region's 19 and under population.

5) In sum, SVWDA is a region that has experienced steady employment growth, remains heavily dependent upon its *Manufacturing* sector, but is also experiencing significant employment and wage growth in other key areas such as *Transportation and Warehousing* and *Health Care*.

Introduction

To aid in on-going strategic planning efforts, this report provides an assessment of the state of the workforce in the Shenandoah Valley Workforce Development Area (SVWDA).¹ The remainder of the report is divided into five sections. The *Area Profile* section provides general background information on recent economic and demographic trends within SVWDA. The *Key Sectors* section augments this general information by providing additional detail on four major industries in SVWDA that have been designated by SVWDA staff as key employment sectors. Next, the *Industry Performance* section details recent performance trends in major and targeted industry sectors within SVWDA. This is followed by the *Gap Analysis* section that compares the occupation-driven demand for graduates in SVWDA with the pipeline of graduates from regional postsecondary education institutions to identify areas of potential unmet need. Finally, the *Conclusion* section provides a summary and concluding comments.

This report was commissioned by the Shenandoah Valley Workforce Development Board and produced by Mangum Economics.

Area Profile

In this section, we set the stage for the analysis to follow by providing background information on SVWDA's economic and demographic characteristics.

Employment Characteristics

Total Employment

Figure 1 details the change in total employment in SVWDA as a whole from the five-year period from the second quarter of 2011 through the second quarter of 2016. As these data show, total employment increased steadily over the period, rising from 205,894 jobs in the second quarter of 2011 to 217,866 jobs in the second quarter of 2016, for a gain 11,972 jobs over the period, or a 5.8 percent increase in total employment.

¹ The Shenandoah Valley Workforce Development Area is defined to encompass the cities of Buena Vista, Harrisonburg, Lexington, Staunton, Waynesboro, Winchester, and the counties of Augusta, Bath, Clarke, Frederick, Highland, Page, Rockbridge, Rockingham, Shenandoah, and Warren.

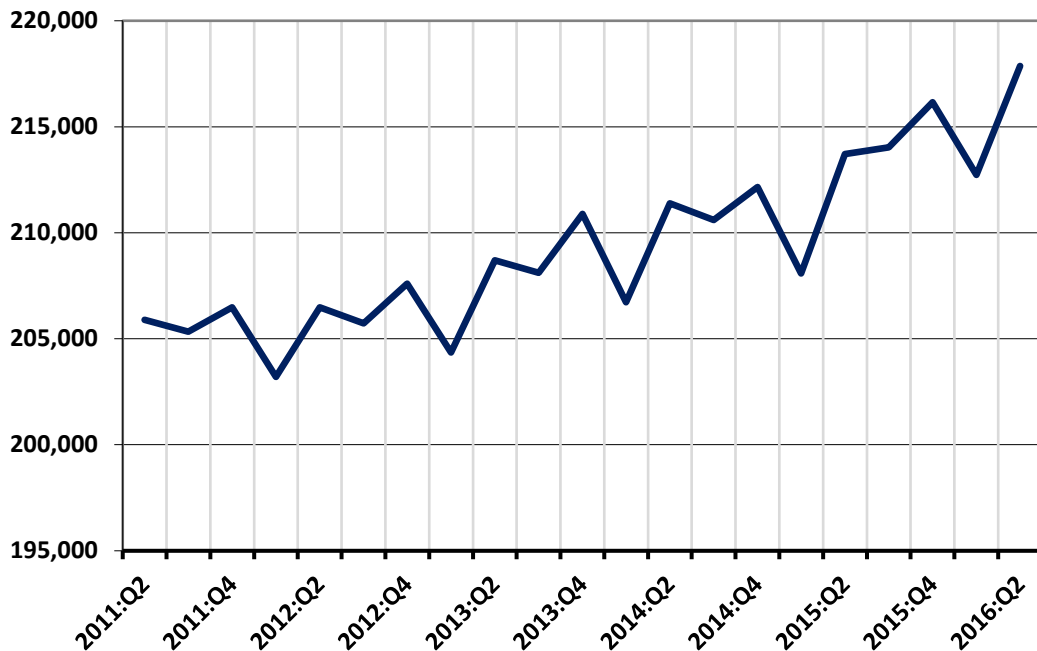


Figure 1: SVWDA Total Employment – 2011:Q2 to 2016:Q2²

Figure 2 puts these numbers in perspective by comparing year-over-year changes in employment in SVWDA to that of the state as a whole. Any observation above the horizontal zero line in this graph reflects an increase in employment from the prior year, while any observation below the zero line reflects a decrease in employment from the prior year. As these data indicate, although SVWDA Area enjoyed positive employment growth throughout the period, that growth was subject to periods of deceleration from the fourth quarter of 2011 through the third quarter of 2012, and throughout 2014. With the exception of the most recent quarter, employment growth has since accelerated, and as of the second quarter of 2016 stood at 1.9 percent in SVWDA and 1.7 percent statewide.

² Data Source: Virginia Employment Commission, “Quarterly Census of Employment and Wages.”

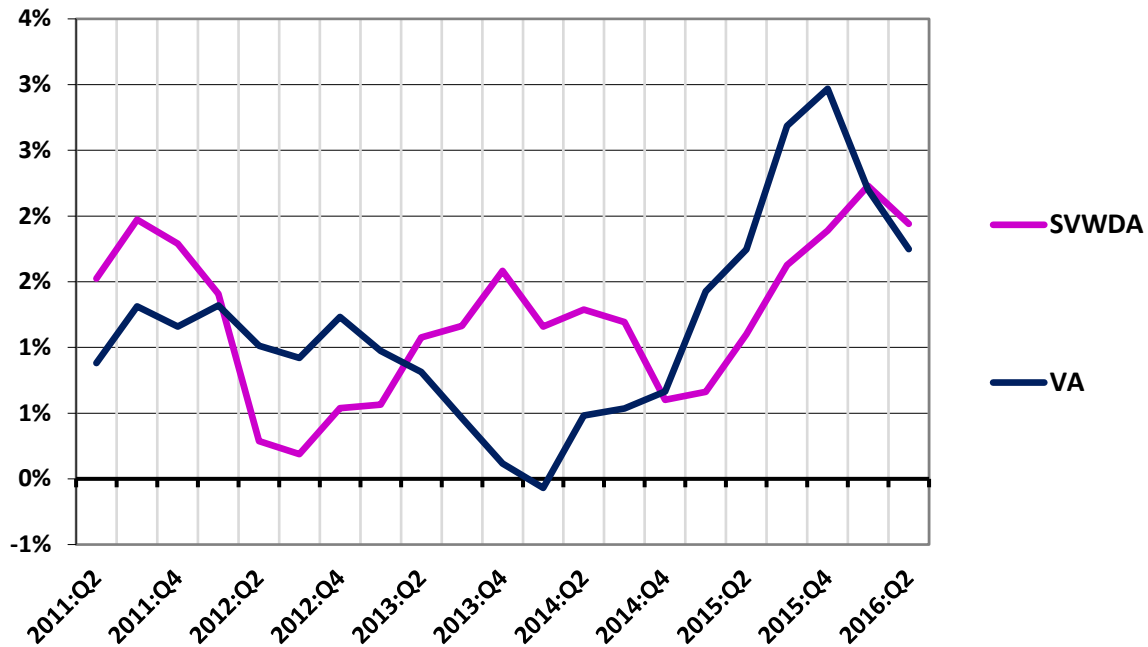


Figure 2: Year-Over-Year Change in Employment – 2011:Q2 to 2016:Q2³

Drilling down to a local level, Figure 3 provides a breakdown of the 271,866 in total employment in SVWDA in the second quarter of 2016 for each of the 16 localities that comprise SVWDA. As these data demonstrate, the City of Harrisonburg exhibited the largest employment that quarter (31,398 jobs), followed by Rockingham County (31,509 jobs), Frederick County (30,181 jobs), Augusta County (27,249 jobs), and the City of Winchester (24,912 jobs).

³ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

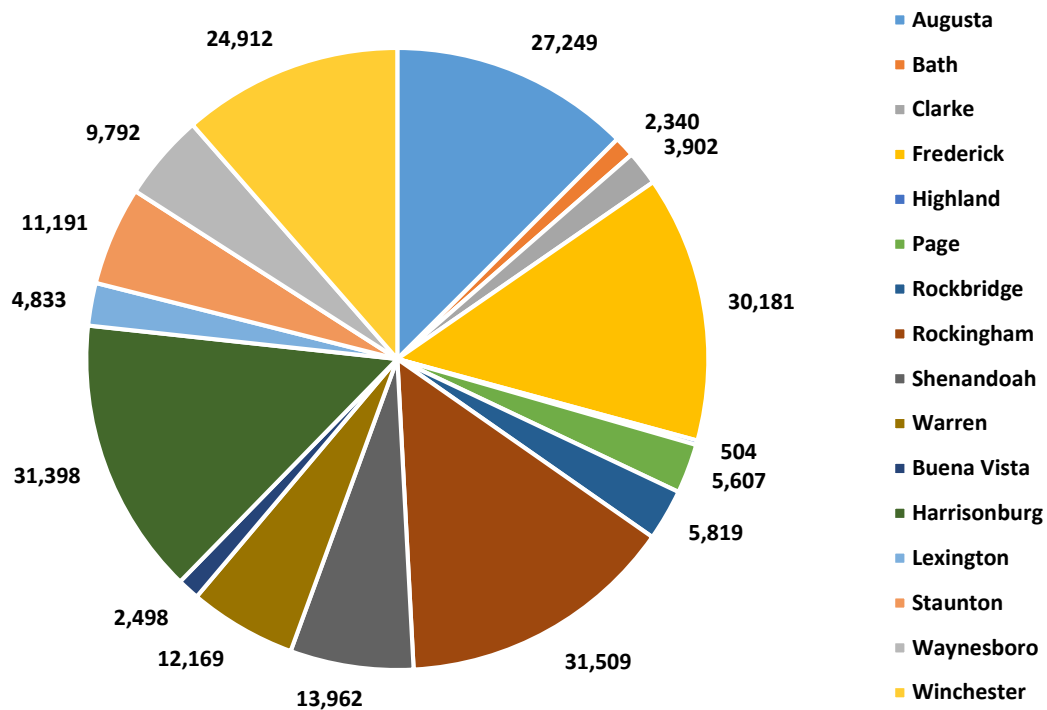


Figure 3: SVWDA Total Employment by Locality in 2016:Q2⁴

Lastly, Figures 4A and 4B respectively depict the most recent one-year and five-year total employment growth rates in SVWDA and each of its sixteen localities. As shown in Figure 4A, between the second quarter of 2015 and the second quarter of 2016 the short-term one-year increase in total employment in SVWDA was 1.9 percent and the top three fastest growing localities were Clarke County (4.0 percent), Highland County (3.5 percent), and Augusta County (3.2 percent). While as shown in Figure 4B, between the second quarter of 2011 and the second quarter of 2016 the long-term five-year increase in total employment in SVWDA was 5.8 percent and the top three fastest growing localities over that period were Frederick County (23.0 percent), the City of Buena Vista (15.6 percent), and Rockingham County (13.1 percent).

⁴ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

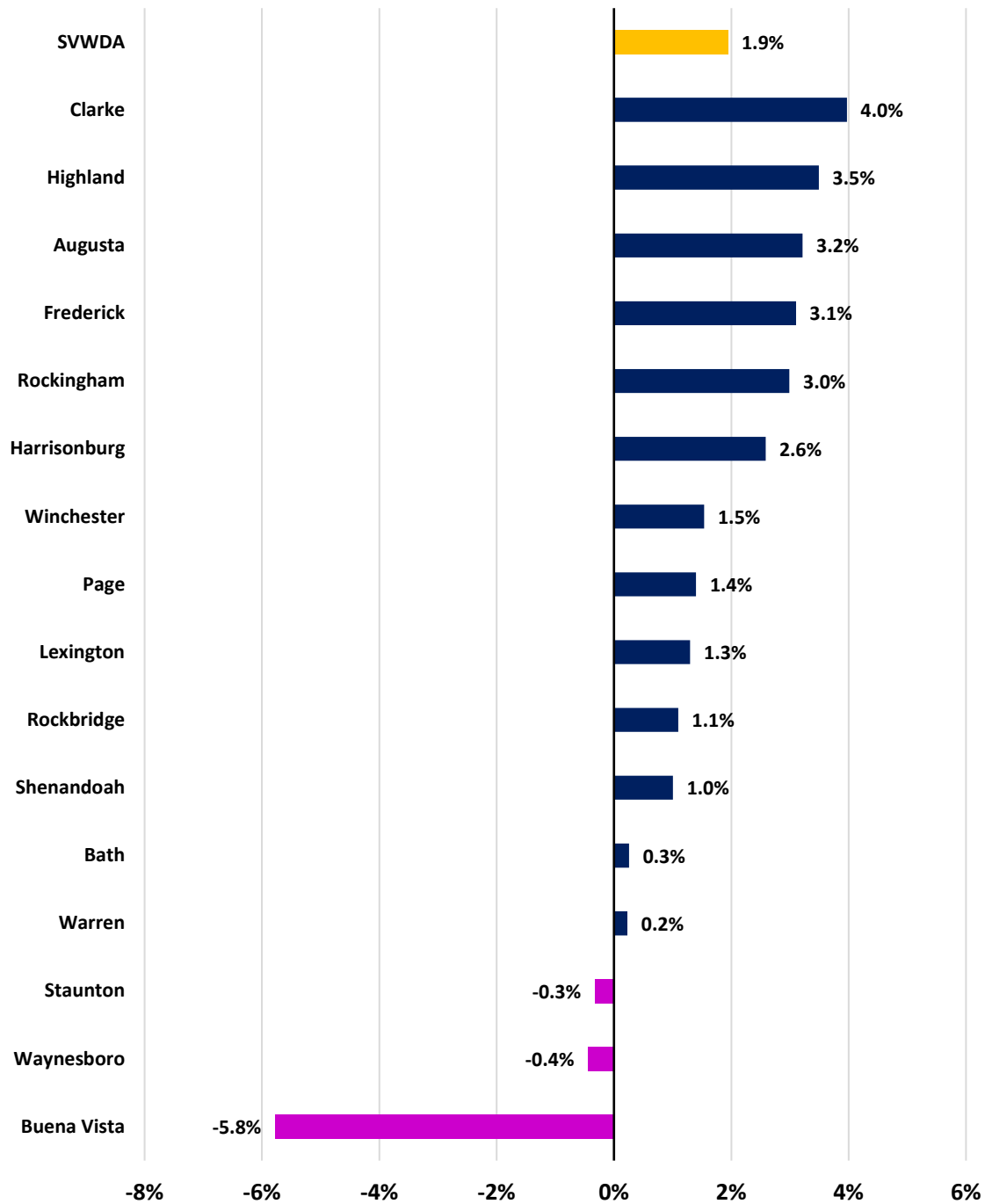


Figure 4A: One-Year Growth in Total Employment – 2015:Q2 to 2016:Q2⁵

⁵ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

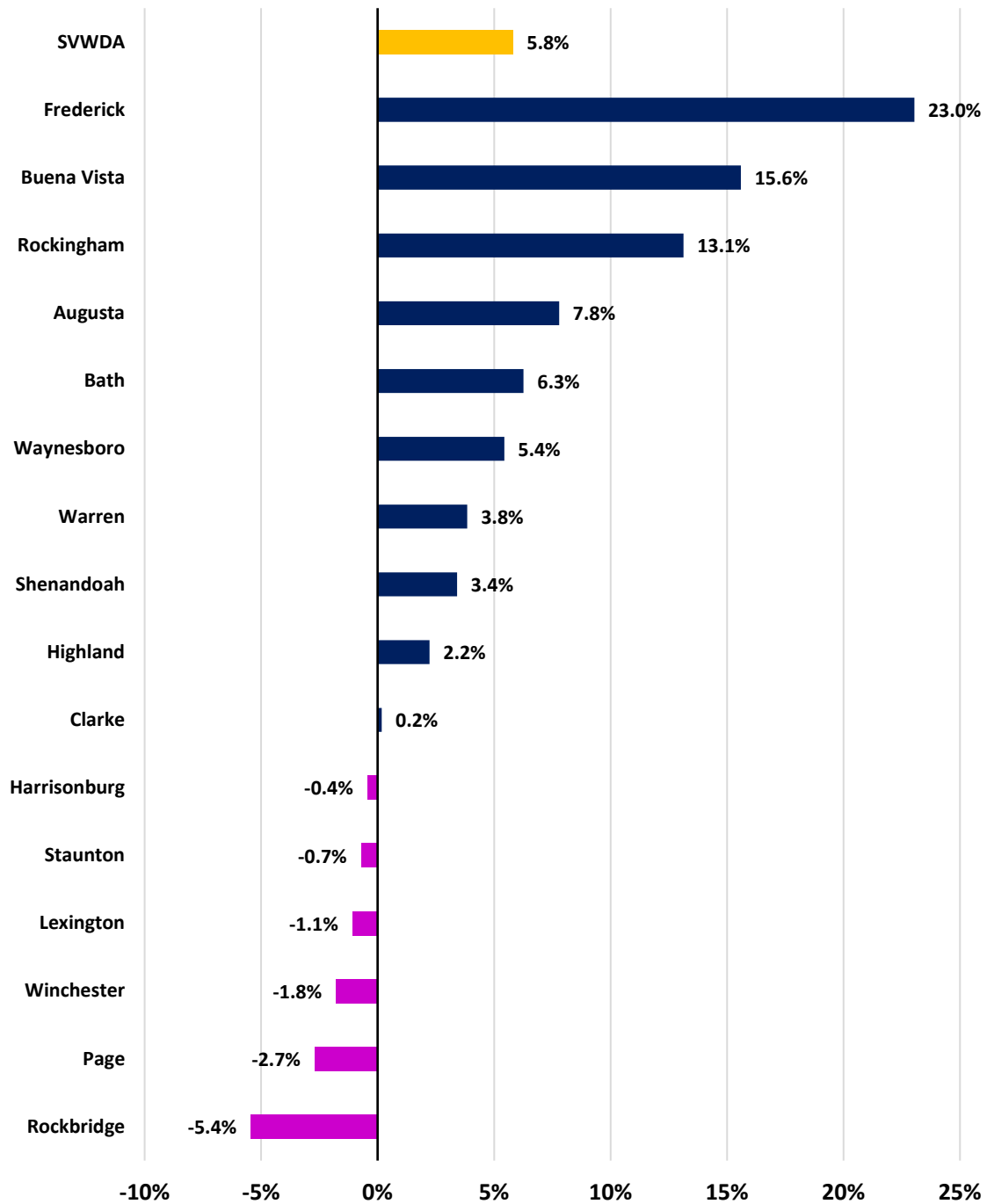


Figure 4B: Five-Year Growth in Total Employment – 2011:Q2 to 2016:Q2⁶

⁶ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

Total Employment by Industry Size

In this portion of the section, we look at total employment in terms of small versus large businesses, where small businesses are defined as having less than 50 employees and large businesses are defined as having 50 or more employees. Figure 5 depicts the distribution of total employment in SVWDA in the second quarter of 2016 by small versus large businesses and compares those proportions to data for the state of Virginia as a whole. As these data show, small businesses accounted for a larger proportion of SVWDA's total employment that quarter (42 percent) than was typical at the statewide level (39 percent).

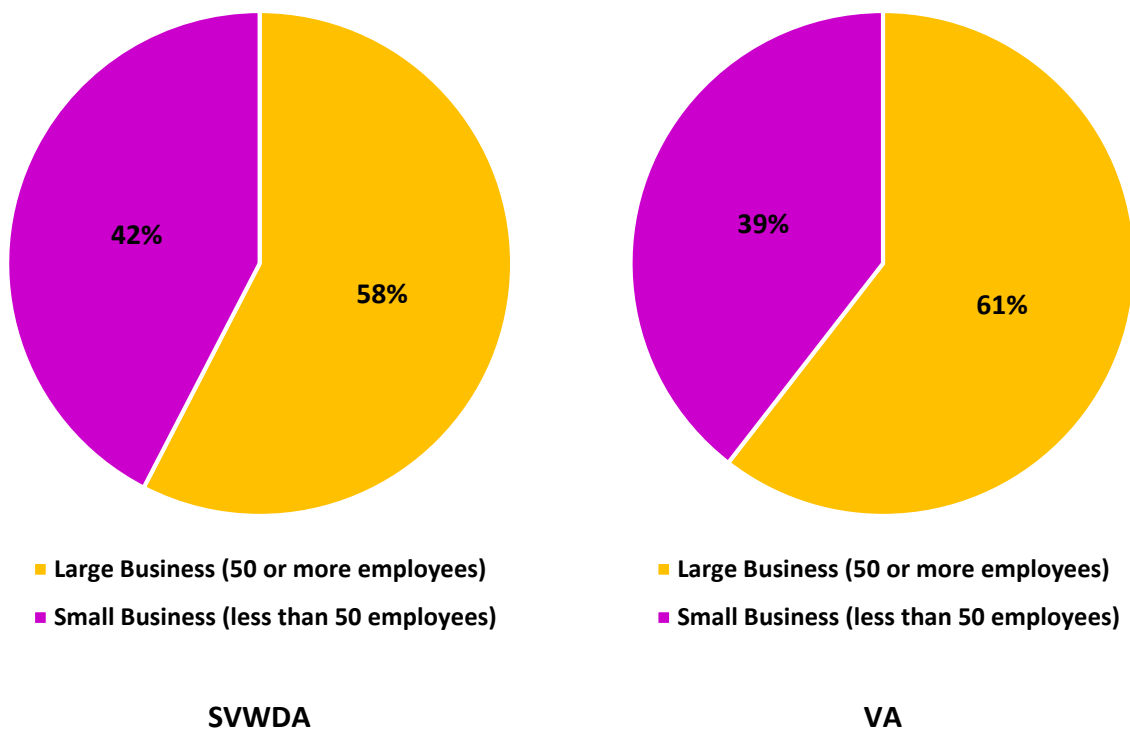


Figure 5: Total Employment by Industry Size in 2016:Q2⁷

Figure 6 provides additional data on the relative contributions of small and large businesses to the one-year and five-year growth in total employment in SVWDA and benchmarks those data against the state of Virginia as a whole. What these data show is that, just as total employment was more evenly split between small and large businesses in SVWDA than at the statewide

⁷ Data Source: Virginia Employment Commission, "Establishments by Size Class."

level, these difference classes of business size also contributed more evenly to total employment growth in SVWDA than at the statewide level.

In SVWDA, small businesses were responsible for generating 49 percent of total employment growth between the second quarter of 2015 to second quarter of 2016, and 52 percent of total employment growth between the second quarter of 2011 to second quarter of 2016. In contrast, at the statewide level employment growth was much more dependent on small businesses, even though they comprised a smaller proportion of the overall employment picture. In Virginia as a whole, small businesses were responsible for generating 59 percent of total employment growth between the second quarter of 2015 to second quarter of 2016, and 53 percent of total employment growth between the second quarter of 2011 to second quarter of 2016.

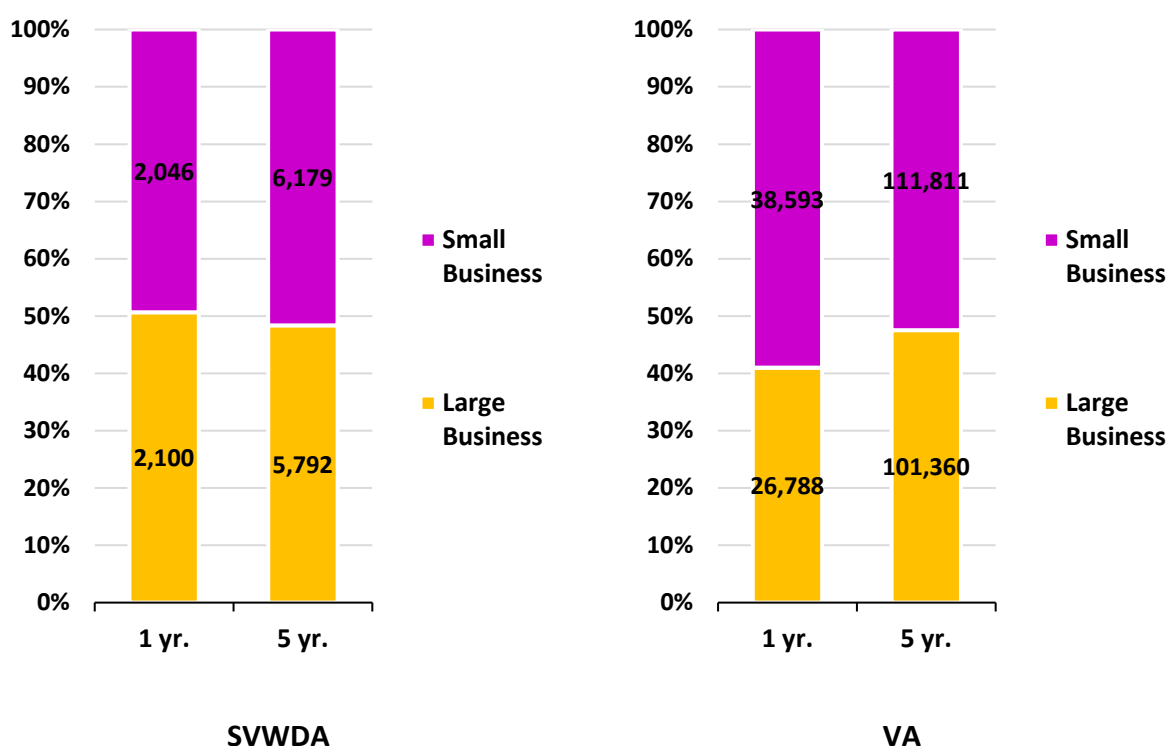


Figure 6: One-Year and Five-Year Change in Total Employment by Industry Size⁸

⁸ Data Source: Virginia Employment Commission, "Establishments by Size Class."

Total Employment by Ownership Category

In this portion of the section, we provide a break-down of total employment in SVWDA in the second quarter of 2016 by ownership category. As the data depicted in Figure 7 show, the private sector accounted for 181,728 jobs (or 83 percent) of the region's total employment of 217,866 that quarter, while the government sector accounted for 36,138 jobs (or 17 percent). As depicted in Figure 8, average wages across all sectors were \$746 per week in the first quarter of 2016, \$737 per week in the private sector, and \$792 per week in the government sector.

Lastly, Figures 9A and 9B respectively depict the one-year and five-year change in employment in each of these ownership categories in SVWDA. As shown in Figure 9A, total employment in SVWDA increased by 4,147 jobs between the second quarter of 2015 and the second quarter of 2016, with the private sector experiencing a net gain of 4,301 jobs and the government sector experiencing a net loss of 155 jobs. While as shown in Figure 9B, total employment in SVWDA increased by 11,972 jobs between the second quarter of 2011 and the second quarter of 2016, with the private sector experiencing a net gain of 11,705 jobs and the government sector experiencing a net gain of 267 jobs.

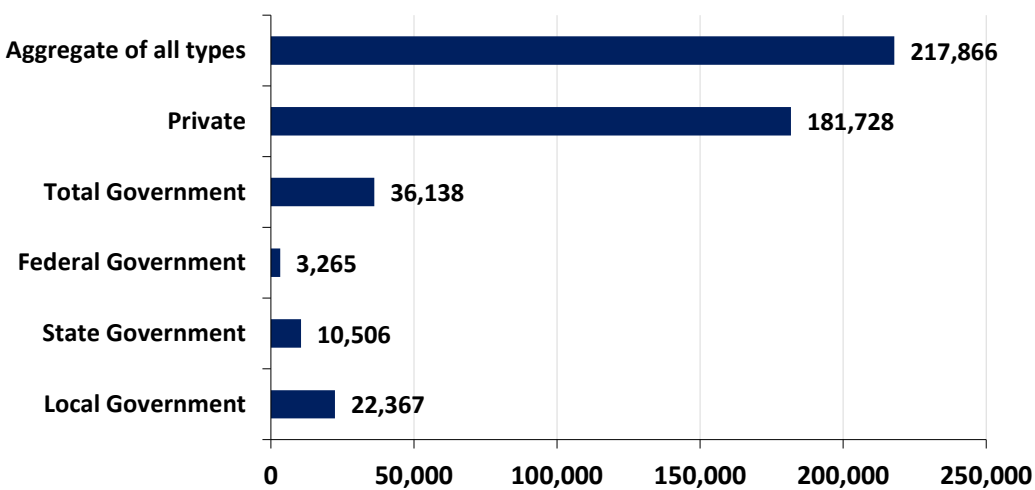


Figure 7: SVWDA Total Employment by Ownership Category, 2016:Q2⁹

⁹ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

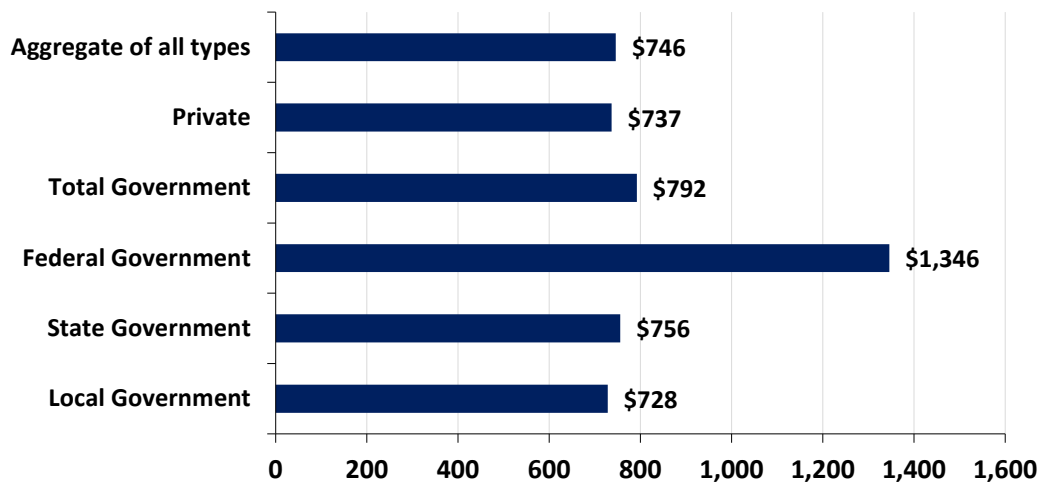


Figure 8: SVWDA Average Weekly Wages by Ownership Category, 2016:Q2¹⁰

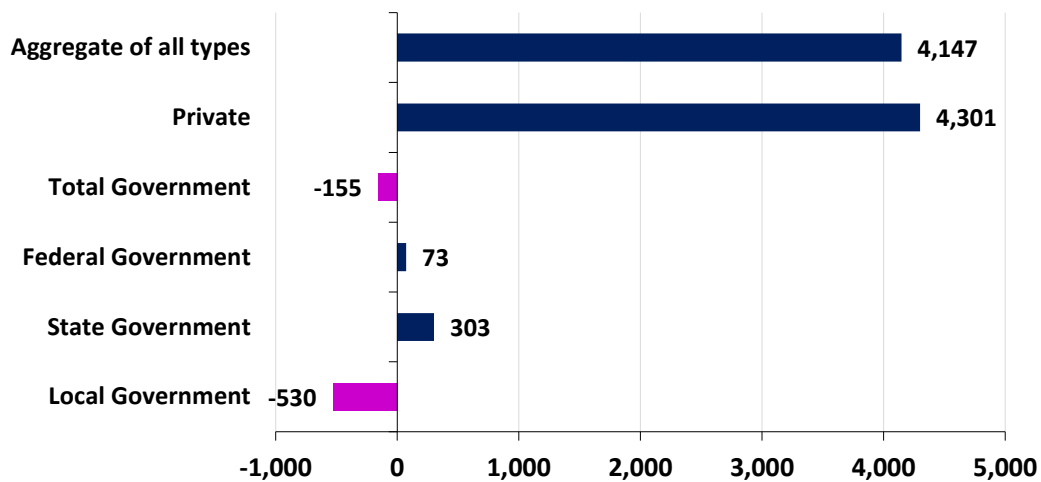


Figure 9A: SVWDA One-Year Change in Total Employment by Ownership Category, 2015:Q2 to 2016:Q2¹¹

¹⁰ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

¹¹ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

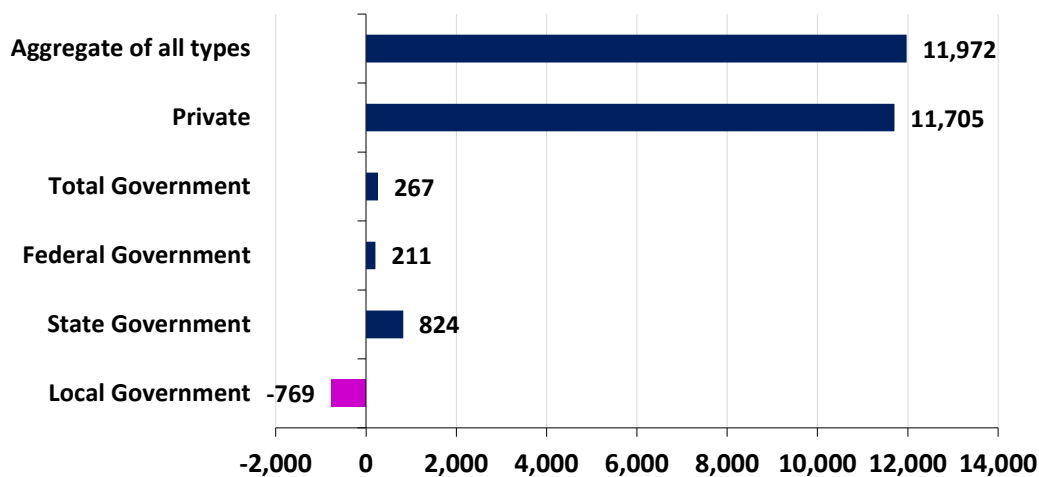


Figure 9B: SVWDA Five-Year Change in Total Employment by Ownership Category, 2011:Q2 to 2016:Q2¹²

Private Employment by Major Industry Sector

To provide a better understanding of the factors underlining some of the changes in total employment described earlier, in this portion of the section we provide a drill down for private employment by major industry sector. Figure 10 depicts private employment by major industry sector in SVWDA in the second quarter of 2016. As these data indicate, *Manufacturing* was the largest employment sector in SVWDA that quarter, accounting for 31,718 jobs or 18 percent of total private sector employment. *Health Care and Social Assistance* ranked second with 27,532 jobs (16 percent of total private sector employment), *Retail Trade* third with 26,741 jobs (15 percent), *Accommodation and Food Services* fourth with 23,134 jobs (13 percent), and *Transportation and Warehousing* fifth with 11,049 jobs (6 percent). Recall from Figure 7 that total private employment in SVWDA in the second quarter of 2016 was 181,728 jobs.

¹² Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

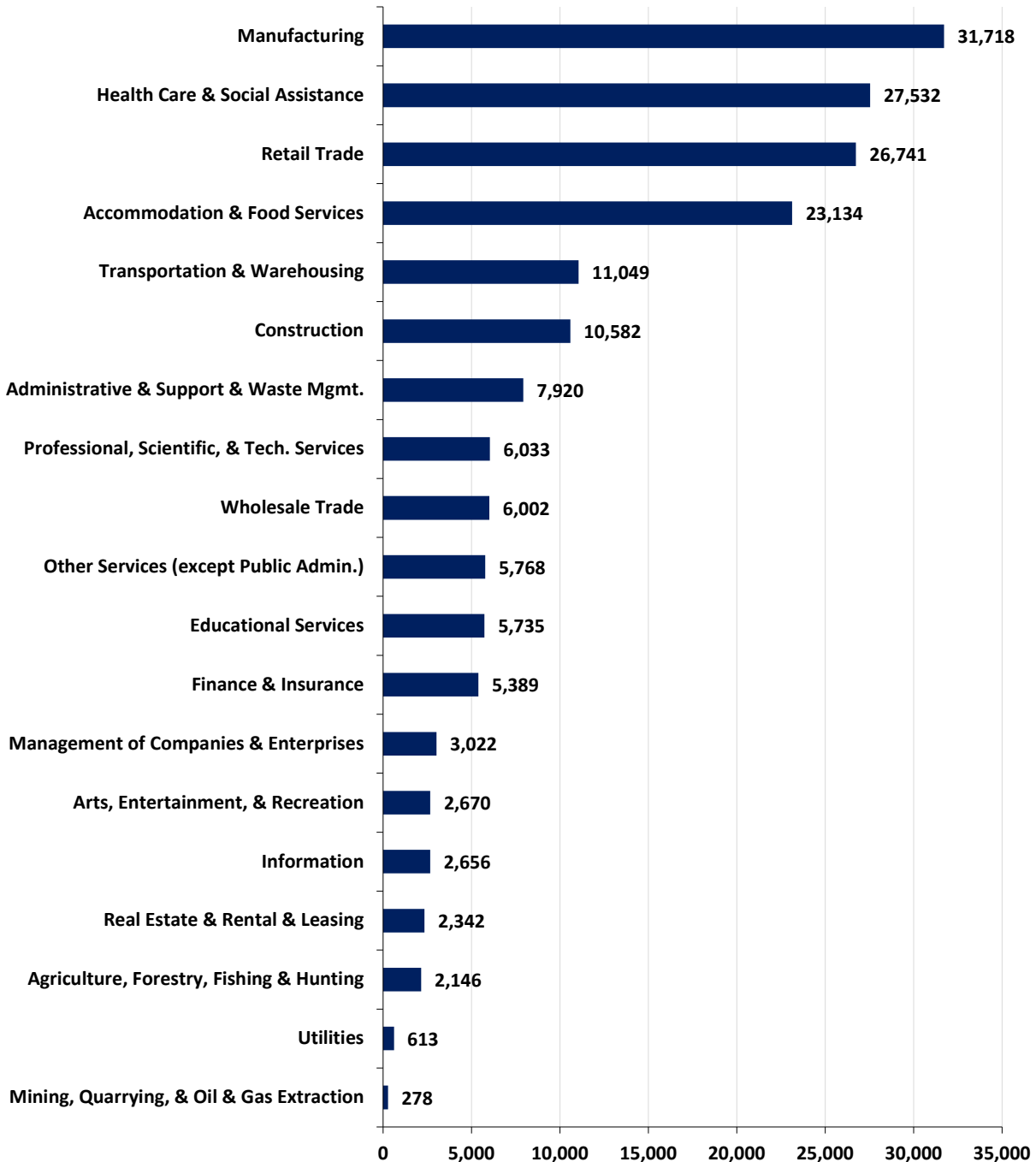


Figure 10: SVWDA Private Employment by Major Industry Category, 2016:Q2¹³

¹³ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

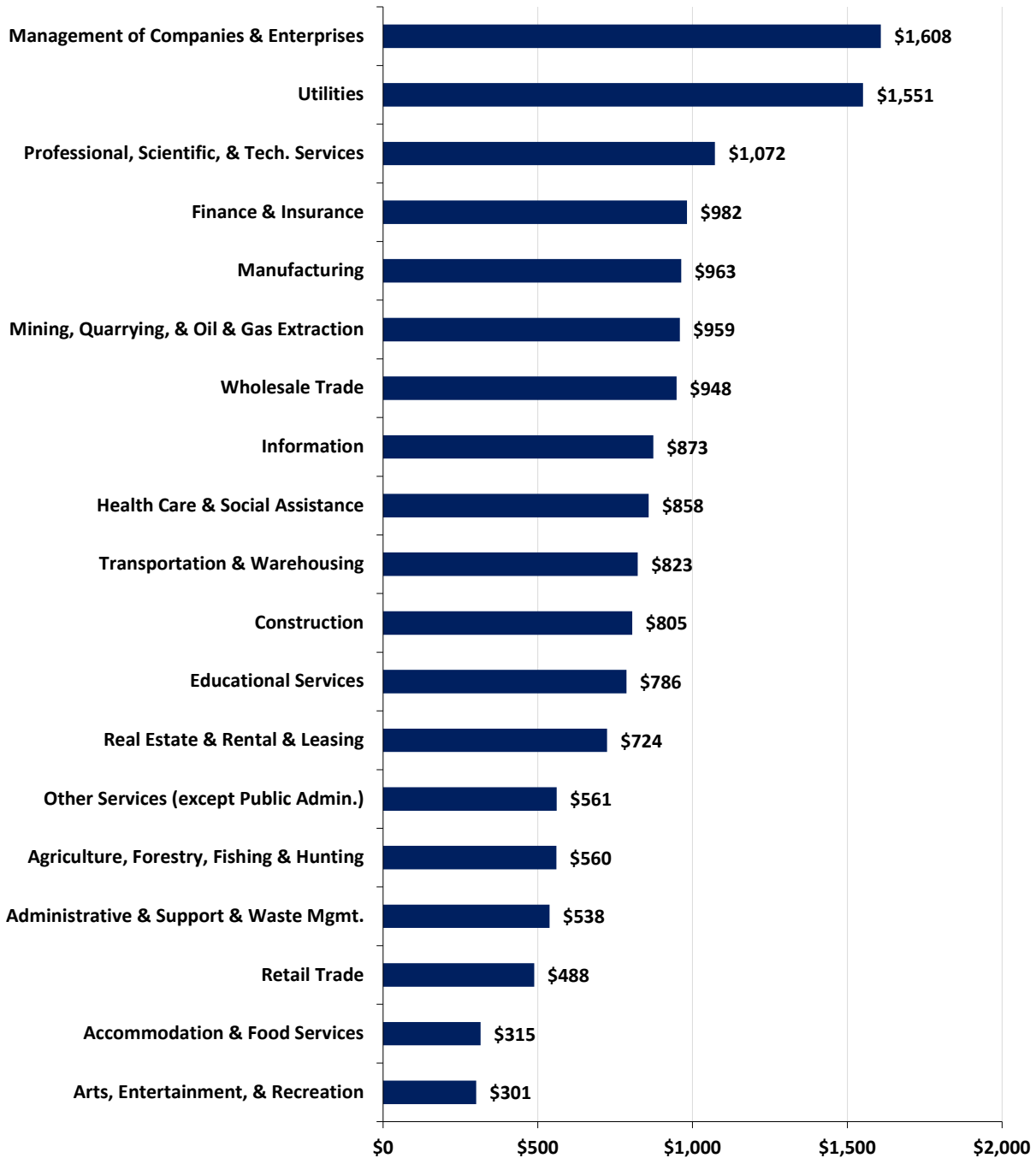


Figure 11: SVWDA Private Average Weekly Wages by Major Industry Category, 2016:Q2¹⁴

¹⁴ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

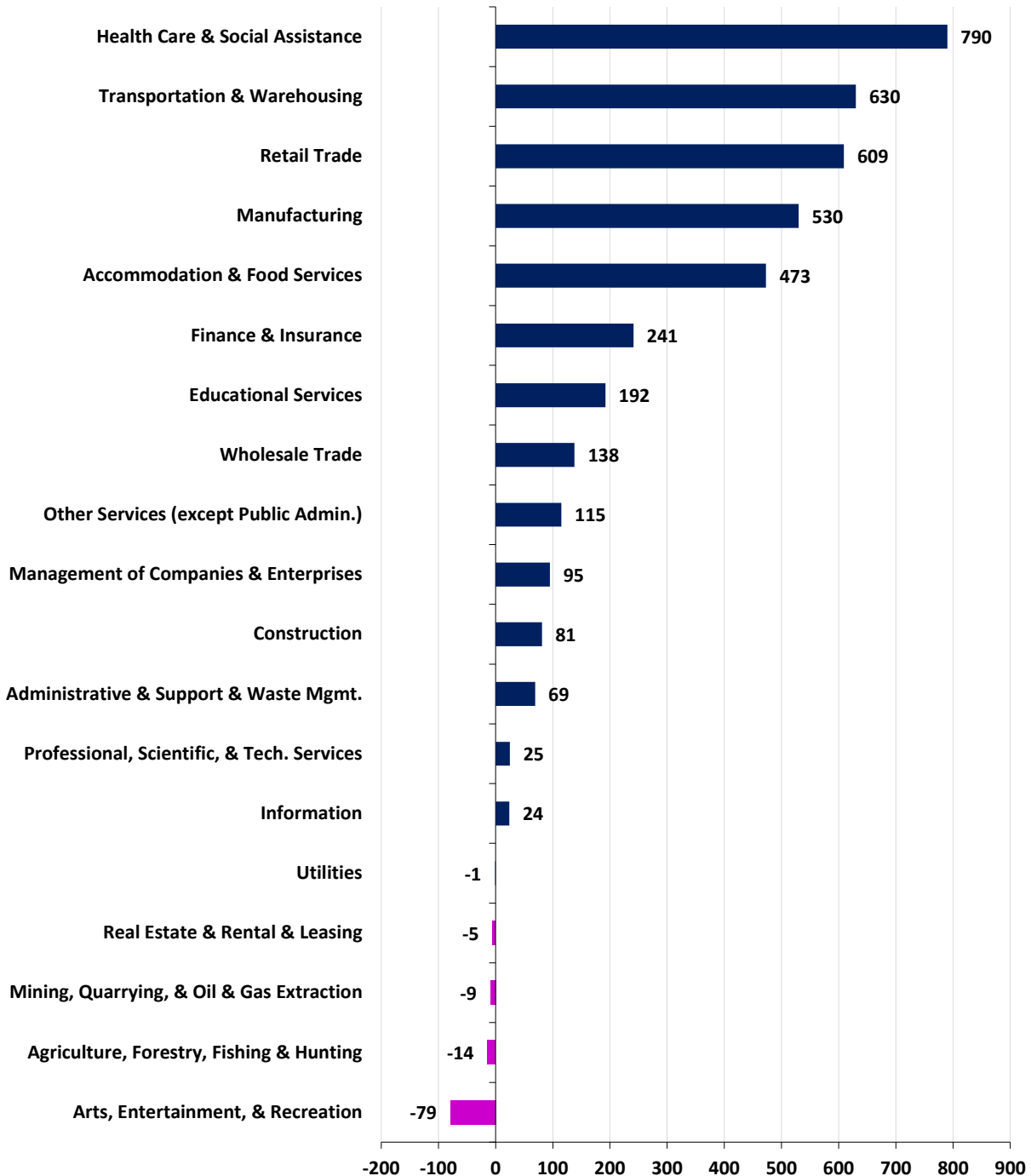


Figure 12A: SVWDA One-Year Change in Private Employment by Major Industry Category, 2015:Q2 to 2016:Q2¹⁵

¹⁵ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

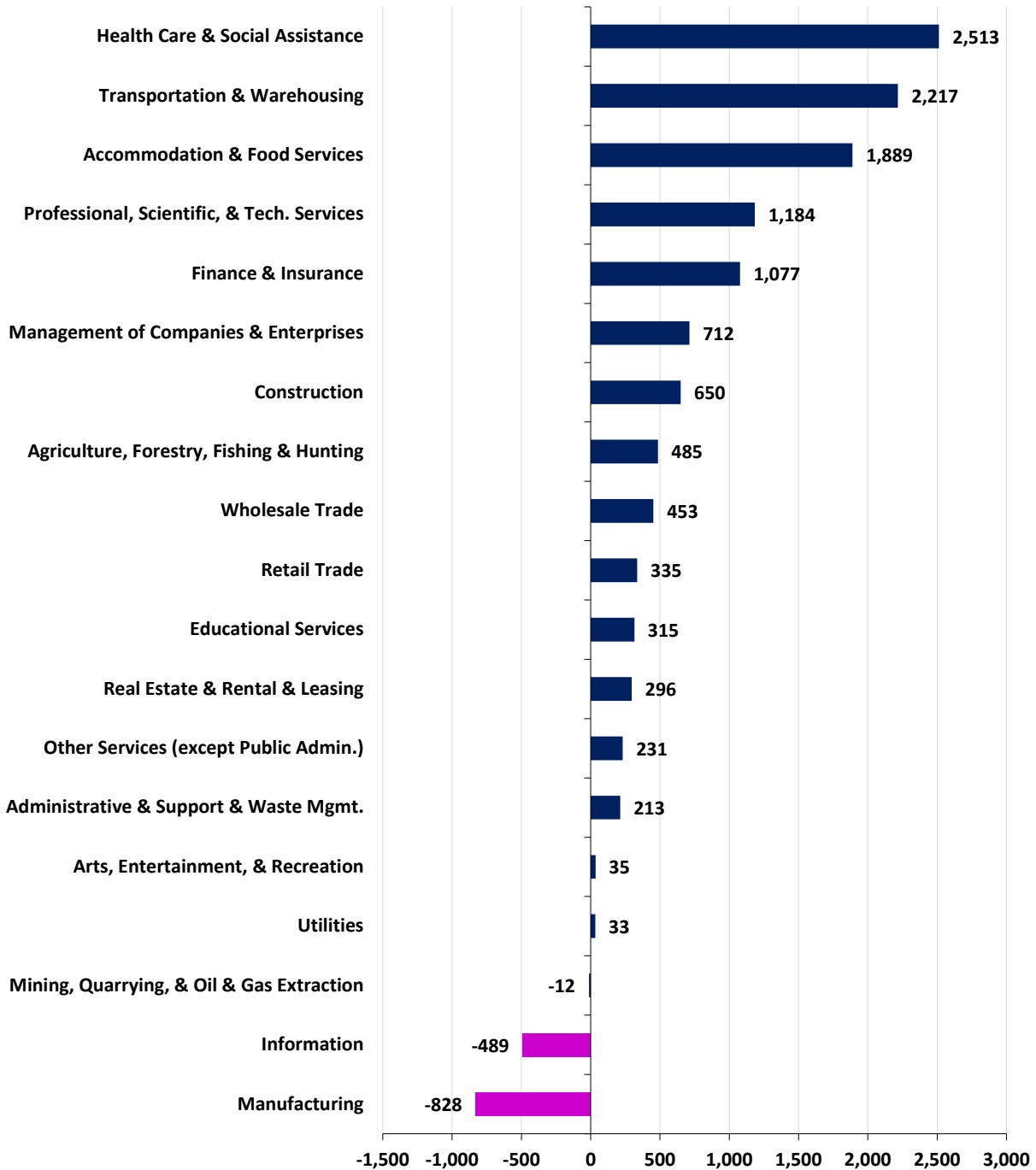


Figure 12B: SVWDA Five-Year Change in Private Employment by Major Industry Category, 2011:Q2 to 2016:Q2¹⁶

¹⁶ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

Figure 11 provides similar information for private sector average weekly wages by major industry category. As these data show, *Management of Companies and Enterprises* was the highest paying employment sector in SVWDA in the second quarter of 2016, with average weekly wages of \$1,608. *Utilities* ranked second with average weekly wages of \$1,551, *Professional, Scientific, and Technical Services* third at \$1,072 per week, *Finance and Insurance* fourth at \$982 per week, and *Manufacturing* fifth at \$963 per week. To put these numbers in perspective, recall from Figure 8 that the average weekly wage across all private industry sectors in the Shenandoah Valley Workforce Development Area was \$737 in the second quarter of 2016.

Figure 12A depicts the private employment gain by major industry sector in SVWDA between the second quarter of 2015 and the second quarter of 2016 in SVWDA. Overall over this one-year period, SVWDA gained a total of 4,301 private sector jobs. As shown in Figure 12A, the largest employment gains occurred in *Health Care and Social Assistance* (up 790 jobs), *Transportation and Warehousing* (up 630 jobs), and *Retail Trade* (up 609 jobs). At the other end of the spectrum, the largest one-year employment losses occurred in *Arts, Entertainment, and Recreation* (down 79 jobs), *Agriculture* (down 14 jobs), and *Mining* (down 9 jobs).

Similarly, Figure 12B depicts the employment gain by major industry category in SVWDA between the second quarter of 2011 and the second quarter of 2016 in SVWDA. During this five-year period, SVWDA gained a total of 11,705 private sector jobs, with the largest increases occurring in *Health Care and Social Assistance* (up 2,513 jobs), *Transportation and Warehousing* (up 2,217 jobs), and *Accommodation and Food Services* (up 1,889 jobs). At the other end of the spectrum, the largest five-year employment losses occurred in *Manufacturing* (down 828 jobs), *Information* (down 489 jobs), and *Mining* (down 12 jobs).

Unemployment

In this portion of the section we review recent unemployment trends in SVWDA. Figure 13 depicts the monthly unemployment rate in SVWDA from November of 2011 through November of 2016 and benchmarks those numbers against the state of Virginia as a whole. As these data show, unemployment rates slowly, but steadily, declined throughout the period in both jurisdictions. In addition, unemployment rates in the SVWDA have very closely tracked the statewide unemployment rate, particularly since the beginning of 2013. As of November 2016, unemployment stood at 3.9 percent in SVWDA and 4.0 percent statewide in Virginia.

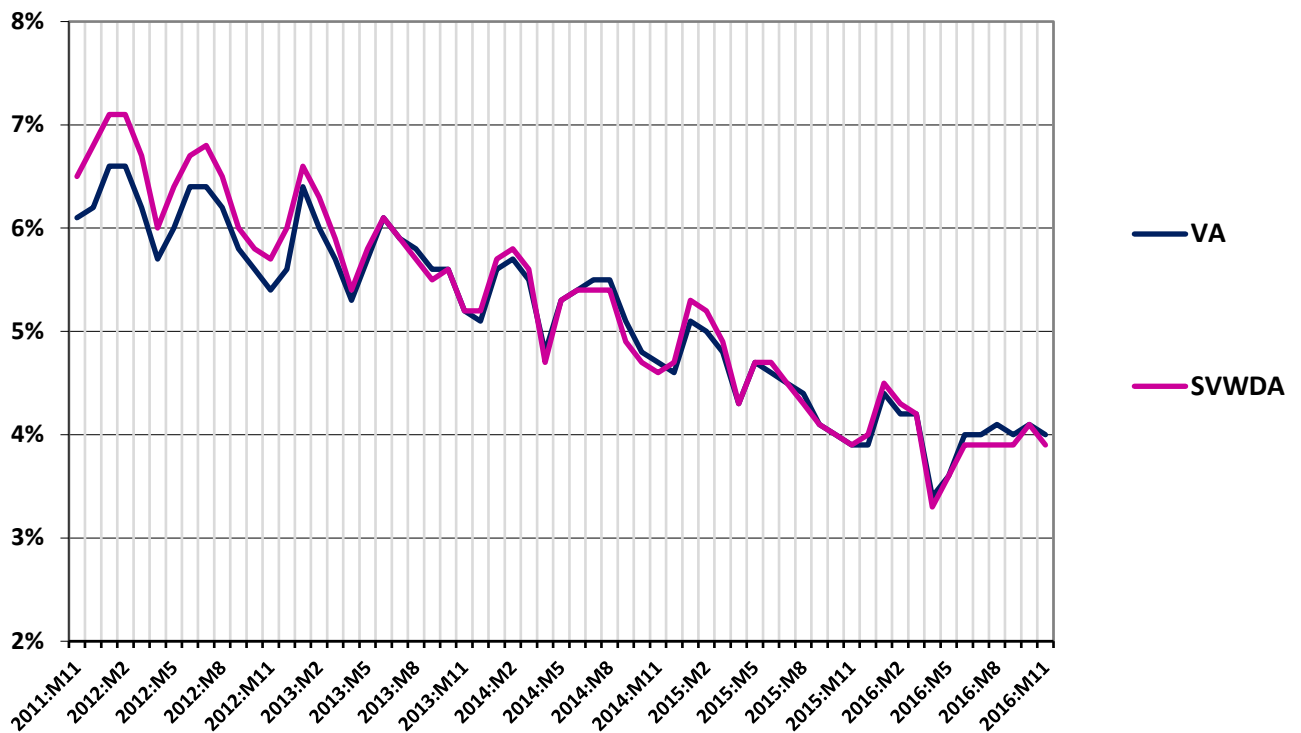


Figure 13: Unemployment Rate, November 2011 to November 2016¹⁷

Drilling down to a local level, Figure 14 provides a breakdown of the November 2016 unemployment rates for each of the 16 localities that comprise SVWDA. As these data demonstrate, the City of Lexington exhibited the largest unemployment rate that month (6.3 percent), followed by the City of Buena Vista (4.9 percent), and Rockbridge County (4.5 percent). At the other end of the spectrum, the lowest unemployment rates that month were in Frederick County (3.3 percent), Rockingham County (3.4 percent), and Highland County (3.4 percent).

¹⁷ Data Source: Virginia Employment Commission, "Local Area Unemployment Statistics."

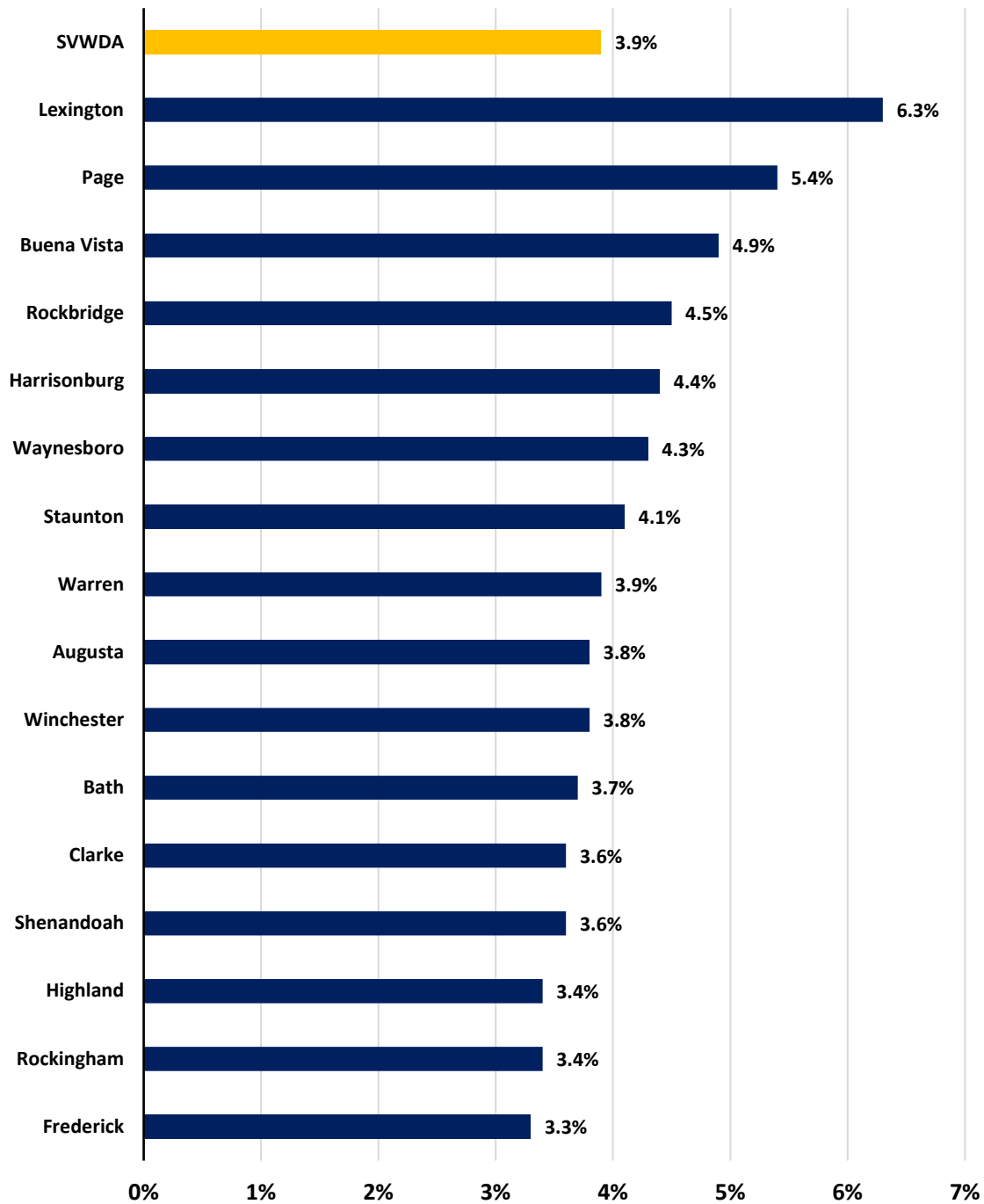


Figure 14: SVWDA Unemployment Rate by Locality – November 2016 ¹⁸

¹⁸ Data Source: Virginia Employment Commission, "Local Unemployment Statistics."

Lastly, Figures 15A through 15C provide key characteristics of the unemployed in SVWDA in November of 2016. As these data show, those individuals were predominantly white (86 percent), 45 years of age or older (56 percent), and possessed only a high school education or less (62 percent).

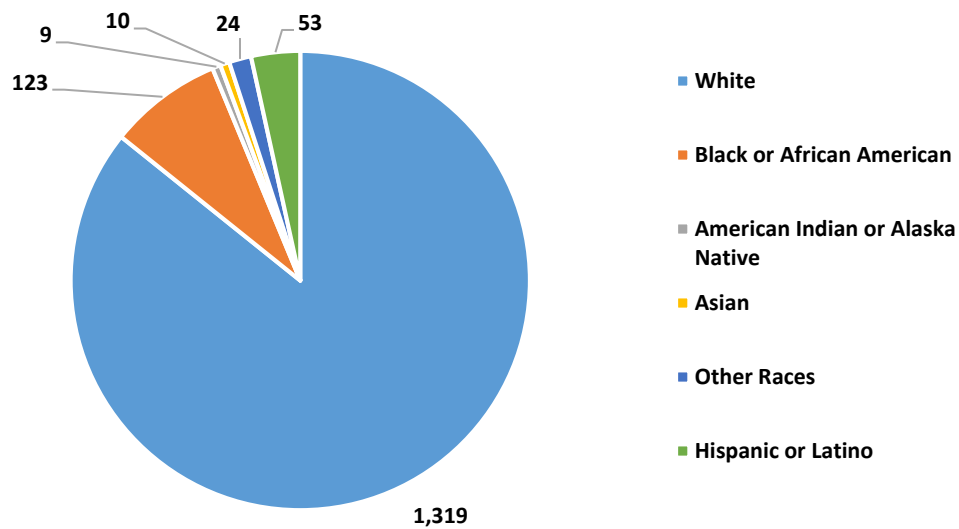


Figure 15A: Characteristics of the Unemployed in SVWDA in November 2016 – Race¹⁹

¹⁹ Data Source: Virginia Employment Commission, “Local Unemployment Statistics.”

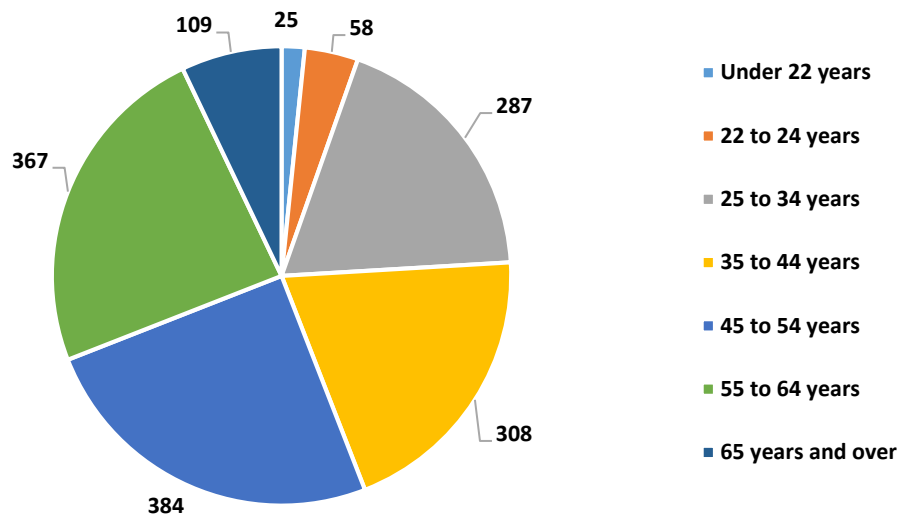


Figure 15B: Characteristics of the Unemployed in SVWDA in November 2016 – Age²⁰

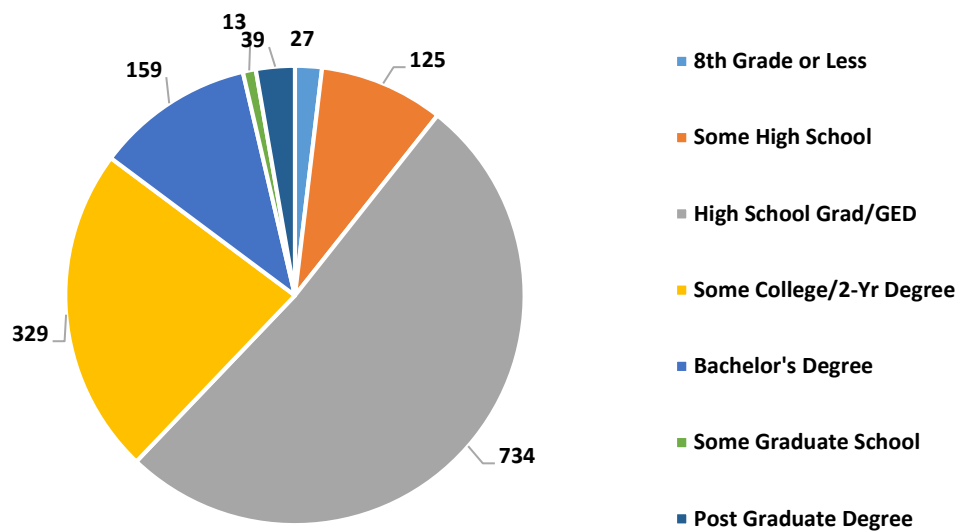


Figure 15B: Characteristics of the Unemployed in SVWDA in November 2016 – Educational Attainment²¹

²⁰ Data Source: Virginia Employment Commission, "Local Unemployment Statistics."

²¹ Data Source: Virginia Employment Commission, "Local Unemployment Statistics."

Demographic Characteristics

Population Characteristics in 2015

Tables 1A and 1B provide an age breakdown of the population in SVWDA and the sixteen localities that it encompasses in 2015. As these data demonstrate, overall the age distribution in the SVWDA tended to mirror that of the state of Virginia as a whole that year. At the local level, however, the population of Bath County (56 percent 45 and older), Clarke County (51 percent 45 and older), Highland County (69 percent 45 and older), and Rockbridge County (54 percent 45 and older) tended to be older than that of SVWDA (43 percent 45 and older) or the state of Virginia as a whole (40 percent 45 and older). While driven by university student enrollments, the population of the City of Harrisonburg (77 percent 44 and younger) and the City of Lexington (78 percent 44 and younger) tended to be younger than that of SVWDA (57 percent 44 and younger) or the state of Virginia as a whole (59 percent 44 and younger).

Tables 2A and 2B provide a similar breakdown of the 2015 population by race and ethnicity. As these data indicate, in 2015 the population of the Shenandoah Valley was less diverse than the statewide norm, with an 85 percent majority white population as compared to 63 percent at the statewide level. At the local level, the most diverse localities within SVWDA in 2015 were the City of Harrisonburg (69 percent white) and the City of Winchester (68 percent white). These were also the localities with SVWDA's proportionally largest Hispanic populations – 18 percent in the City of Harrisonburg and 16 percent in the City of Winchester.

Table 1A: 2015 SVWDA Population by Age – Absolute²²

Locality	0 to 19	20 to 44	45 to 64	65+	Total
Augusta County	16,598	21,327	22,577	13,551	74,053
Bath County	975	1,076	1,498	1,034	4,583
Clarke County	3,489	3,560	4,565	2,685	14,299
Frederick County	21,197	25,218	23,105	11,820	81,340
Highland County	348	353	780	763	2,244
Page County	5,412	6,768	7,054	4,609	23,843
Rockbridge County	4,432	5,759	6,989	5,264	22,444
Rockingham County	20,042	22,444	21,729	13,570	77,785
Shenandoah County	9,857	12,018	12,437	8,412	42,724
Warren County	9,820	11,727	11,510	5,424	38,481
Buena Vista	1,824	2,299	1,472	1,071	6,666
Harrisonburg	15,209	24,242	7,924	4,013	51,388
Lexington	2,157	3,311	781	822	7,071
Staunton	5,412	7,656	6,276	4,849	24,193
Waynesboro	5,297	6,801	5,266	3,786	21,150
Winchester	7,107	9,130	7,041	3,890	27,168
SVWDA	129,176	163,689	141,004	85,563	519,432
Virginia	2,098,628	2,840,713	2,215,628	1,101,661	8,256,630

²² *Data Source:* U.S. Census Bureau, “American Community Survey.” It is important to point out that, unlike the decennial census, the annual American Community Survey is indeed a survey. In 2015, only about 1.6 percent of Virginia households were included in the American Community Survey. As a result, the smaller a locality, the more likely this survey is to undercount small subpopulations.

Table 1B: 2015 SVWDA Population by Age – Percentage²³

Locality	0 to 19	20 to 44	45 to 64	65+	Total
Augusta County	22%	29%	30%	18%	100%
Bath County	21%	23%	33%	23%	100%
Clarke County	24%	25%	32%	19%	100%
Frederick County	26%	31%	28%	15%	100%
Highland County	16%	16%	35%	34%	100%
Page County	23%	28%	30%	19%	100%
Rockbridge County	20%	26%	31%	23%	100%
Rockingham County	26%	29%	28%	17%	100%
Shenandoah County	23%	28%	29%	20%	100%
Warren County	26%	30%	30%	14%	100%
Buena Vista	27%	34%	22%	16%	100%
Harrisonburg	30%	47%	15%	8%	100%
Lexington	31%	47%	11%	12%	100%
Staunton	22%	32%	26%	20%	100%
Waynesboro	25%	32%	25%	18%	100%
Winchester	26%	34%	26%	14%	100%
SVWDA	25%	32%	27%	16%	100%
Virginia	25%	34%	27%	13%	100%

²³ *Data Source:* U.S. Census Bureau, “American Community Survey.” It is important to point out that, unlike the decennial census, the annual American Community Survey is indeed a survey. In 2015, only about 1.6 percent of Virginia households were included in the American Community Survey. As a result, the smaller a locality, the more likely this survey is to undercount small subpopulations.

Table 2A: 2015 SVWDA Population by Race and Ethnicity – Absolute²⁴

Locality	White	Black	Hispanic	Asian	Other	Total
Augusta County	67,951	2,939	1,749	430	984	74,053
Bath County	4,179	157	159	0	88	4,583
Clarke County	12,496	784	581	124	314	14,299
Frederick County	69,273	3,587	5,877	1,143	1,460	81,340
Highland County	2,233	0	0	0	11	2,244
Page County	22,569	381	426	123	344	23,843
Rockbridge County	20,927	637	337	157	386	22,444
Rockingham County	70,230	1,395	4,586	550	1,024	77,785
Shenandoah County	38,050	904	2,886	219	665	42,724
Warren County	33,831	1,530	1,509	401	1,210	38,481
Buena Vista	5,927	70	91	473	105	6,666
Harrisonburg	35,479	3,358	9,110	2,105	1,336	51,388
Lexington	5,331	761	273	486	220	7,071
Staunton	19,749	2,890	635	249	670	24,193
Waynesboro	16,526	2,496	1,421	204	503	21,150
Winchester	18,444	2,824	4,430	652	818	27,168
SVWDA	443,195	24,713	34,070	7,316	10,138	519,432
Virginia	5,237,848	1,560,316	709,156	489,610	478,873	8,256,630

²⁴ *Data Source:* U.S. Census Bureau, “American Community Survey.” It is important to point out that, unlike the decennial census, the annual American Community Survey is indeed a survey. In 2015, only about 1.6 percent of Virginia households were included in the American Community Survey. As a result, the smaller a locality, the more likely this survey is to undercount small subpopulations.

Table 2B: 2015 SVWDA Population by Race and Ethnicity – Percentage²⁵

Locality	White	Black	Hispanic	Asian	Other	Total
Augusta County	92%	4%	2%	1%	1%	100%
Bath County	91%	3%	3%	0%	2%	100%
Clarke County	87%	5%	4%	1%	2%	100%
Frederick County	85%	4%	7%	1%	2%	100%
Highland County	100%	0%	0%	0%	0%	100%
Page County	95%	2%	2%	1%	1%	100%
Rockbridge County	93%	3%	2%	1%	2%	100%
Rockingham County	90%	2%	6%	1%	1%	100%
Shenandoah County	89%	2%	7%	1%	2%	100%
Warren County	88%	4%	4%	1%	3%	100%
Buena Vista	89%	1%	1%	7%	2%	100%
Harrisonburg	69%	7%	18%	4%	3%	100%
Lexington	75%	11%	4%	7%	3%	100%
Staunton	82%	12%	3%	1%	3%	100%
Waynesboro	78%	12%	7%	1%	2%	100%
Winchester	68%	10%	16%	2%	3%	100%
SVWDA	85%	5%	7%	1%	2%	100%
Virginia	63%	19%	9%	6%	3%	100%

²⁵ *Data Source:* U.S. Census Bureau, “American Community Survey.” It is important to point out that, unlike the decennial census, the annual American Community Survey is indeed a survey. In 2015, only about 1.6 percent of Virginia households were included in the American Community Survey. As a result, the smaller a locality, the more likely this survey is to undercount small subpopulations.

Population Growth between 2010 and 2015

Figure 16 depicts the overall growth in population between 2010 and 2015 in SVWDA and the sixteen localities that it encompasses, and benchmarks those data against population growth in the state of Virginia as a whole. Overall over this period, total population growth in SVWDA (2 percent) was relatively close to that for the state of Virginia as a whole (3 percent). At the local level, the largest population increases occurred in the City of Harrisonburg (5 percent), the City of Winchester (4 percent), and Frederick County (4 percent). While at the other end of the spectrum, both Highland County and Bath County experienced a 3 percent decline in population over the period.

Tables 3A and 3B break these overall growth rates down into the age cohorts displayed earlier in Figures 1A and 2B. With regard to absolute change, as these data show SVWDA's total population increased by 10,698 over this period, with the largest absolute gains occurring in Frederick County (up 3,035), the City of Harrisonburg (up 2,474), and Rockingham County (up 1,471). While at the other end of the spectrum, both Bath County (down 148) and Highland County (down 77) experienced population declines over the period.

The most striking feature of these data, however, is that both in SVWDA and the state of Virginia as a whole, population increases between 2010 and 2015 were driven by increases in the 65 and older population. At a local level in SVWDA, the largest increases in this age cohort occurred in Frederick County (up 1,866), Augusta County (up 1,712) and Rockingham County (up 1,606). Moreover, this age shift was further exacerbated in SVWDA by an absolute decline in the area's 19 and under population. More specifically, this age cohort declined by 988 in Augusta County, 445 in Frederick County, 342 in Shenandoah County, 323 in Warren County, 296 in Rockingham County, 278 in Rockbridge County, 101 in the City of Waynesboro, 36 in Highland County, and 25 in Clarke County.

Similarly, Tables 4A and 4B break the region's overall population growth down into the race and ethnicity categories that were shown in Tables 2A and 2B. In this case, the most interesting feature of these data is that most of SVWDA's 10,698 population growth between 2010 and 2015 was driven by two race/ethnicity categories specifically – the area's Hispanic population increased by 4,145 (with the largest portion of that increase occurring in the City of Harrisonburg), and the area's Asian population increased by 2,720 (with the largest portion of that increase occurring in Frederick County).

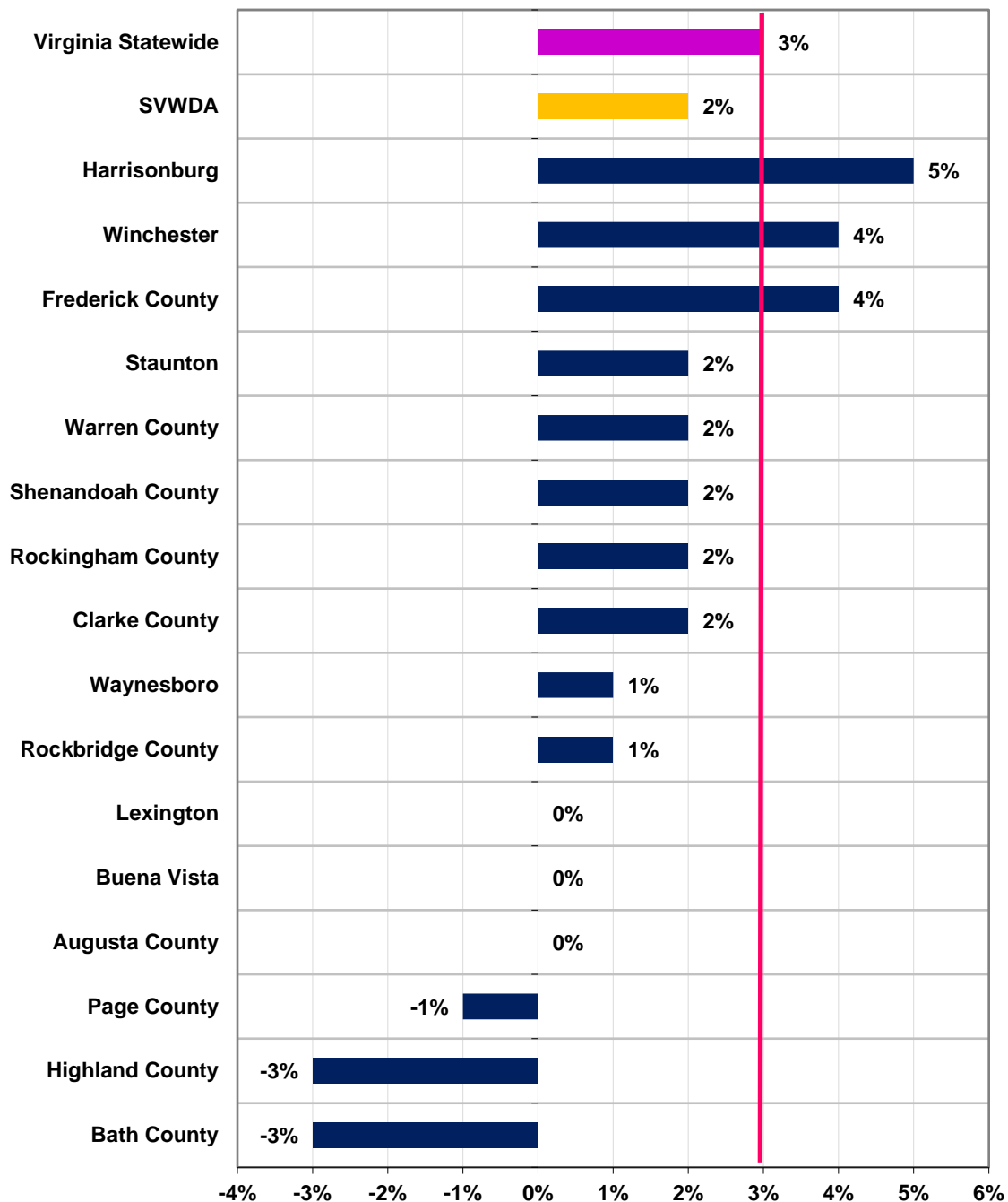


Figure 16: 2010 to 2015 Population Growth²⁶

²⁶ *Data Source:* U.S. Census Bureau, “2010 Census” and “American Community Survey.” It is important to point out that, unlike the decennial census, the annual American Community Survey is indeed a survey. In 2015, only about 1.6 percent of Virginia households were included in the American Community Survey. As a result, the smaller a locality, the more likely this survey is to undercount small subpopulations.

Table 3A: 2010 to 2015 Population Growth by Age – Absolute Change²⁷

Locality	0 to 19	20 to 44	45 to 64	65+	Total
Augusta County	-988	-145	-276	1,712	303
Bath County	65	-175	-20	-18	-148
Clarke County	-25	45	-153	398	265
Frederick County	-445	392	1,222	1,866	3,035
Highland County	-36	-121	-104	184	-77
Page County	-435	-586	264	484	-273
Rockbridge County	-278	-184	-45	644	137
Rockingham County	-296	-73	234	1,606	1,471
Shenandoah County	-342	112	317	644	731
Warren County	-323	121	464	644	906
Buena Vista	75	149	-211	3	16
Harrisonburg	1,169	281	1,044	-20	2,474
Lexington	266	357	-339	-255	29
Staunton	67	366	-145	159	447
Waynesboro	-101	147	-121	219	144
Winchester	232	-171	690	214	965
Shenandoah Valley	-1,395	515	2,821	8,484	10,425
Virginia	14,943	69,275	46,664	124,724	255,606

²⁷ *Data Source:* U.S. Census Bureau, “2000 Census” and “American Community Survey.” It is important to point out that, unlike the decennial census, the annual American Community Survey is indeed a survey. In 2015, only about 1.6 percent of Virginia households were included in the American Community Survey. As a result, the smaller a locality, the more likely this survey is to undercount small subpopulations.

Table 3B: 2010 to 2015 Population Growth by Age – Percentage Change²⁸

Locality	0 to 19	20 to 44	45 to 64	65+	Total
Augusta County	-6%	-1%	-1%	14%	0%
Bath County	7%	-14%	-1%	-2%	-3%
Clarke County	-1%	1%	-3%	17%	2%
Frederick County	-2%	2%	6%	19%	4%
Highland County	-9%	-26%	-12%	32%	-3%
Page County	-7%	-8%	4%	12%	-1%
Rockbridge County	-6%	-3%	-1%	14%	1%
Rockingham County	-1%	0%	1%	13%	2%
Shenandoah County	-3%	1%	3%	8%	2%
Warren County	-3%	1%	4%	13%	2%
Buena Vista	4%	7%	-13%	0%	0%
Harrisonburg	8%	1%	15%	0%	5%
Lexington	14%	12%	-30%	-24%	0%
Staunton	1%	5%	-2%	3%	2%
Waynesboro	-2%	2%	-2%	6%	1%
Winchester	3%	-2%	11%	6%	4%
Shenandoah Valley	-1%	0%	2%	11%	2%
Virginia	1%	2%	2%	13%	3%

²⁸ *Data Source:* U.S. Census Bureau, “2010 Census” and “American Community Survey.” It is important to point out that, unlike the decennial census, the annual American Community Survey is indeed a survey. In 2015, only about 1.6 percent of Virginia households were included in the American Community Survey. As a result, the smaller a locality, the more likely this survey is to undercount small subpopulations.

Table 4A: 2010 to 2015 Population Growth by Race/Ethnicity – Absolute Change²⁹

Locality	White	Black	Hispanic	Asian	Other	Total
Augusta County	-60	58	224	65	16	303
Bath County	-184	-56	58	-7	41	-148
Clarke County	109	42	91	3	20	265
Frederick County	1,683	520	709	961	-838	3,035
Highland County	-51	-6	-18	-4	2	-77
Page County	-389	-62	47	4	127	-273
Rockbridge County	12	52	41	54	-22	137
Rockingham County	590	179	510	96	96	1,471
Shenandoah County	164	205	309	9	44	731
Warren County	486	-179	191	51	357	906
Buena Vista	-55	-275	-12	444	-86	16
Harrisonburg	88	447	1,445	400	94	2,474
Lexington	-476	93	2	478	-68	29
Staunton	165	31	122	67	62	447
Waynesboro	-178	320	84	50	-132	144
Winchester	359	41	389	53	123	965
Shenandoah Valley	2,263	1,410	4,192	2,724	-164	10,425
Virginia	51,398	36,612	72,331	53,312	36,953	255,606

²⁹ *Data Source:* U.S. Census Bureau, “2010 Census” and “American Community Survey.” It is important to point out that, unlike the decennial census, the annual American Community Survey is indeed a survey. In 2015, only about 1.6 percent of Virginia households were included in the American Community Survey. As a result, the smaller a locality, the more likely this survey is to undercount small subpopulations.

Table 4B: 2010 to 2015 Percentage Growth in Population by Race/Ethnicity – Percentage Change³⁰

Locality	White	Black	Hispanic	Asian	Other	Total
Augusta County	0%	2%	15%	18%	2%	0%
Bath County	-4%	-26%	57%	-100%	87%	-3%
Clarke County	1%	6%	19%	2%	7%	2%
Frederick County	2%	17%	14%	528%	-36%	4%
Highland County	-2%	-100%	-100%	-100%	22%	-3%
Page County	-2%	-14%	12%	3%	59%	-1%
Rockbridge County	0%	9%	14%	52%	-5%	1%
Rockingham County	1%	15%	13%	21%	10%	2%
Shenandoah County	0%	29%	12%	4%	7%	2%
Warren County	1%	-10%	14%	15%	42%	2%
Buena Vista	-1%	-80%	-12%	1,531%	-45%	0%
Harrisonburg	0%	15%	19%	23%	8%	5%
Lexington	-8%	14%	1%	5,975%	-24%	0%
Staunton	1%	1%	24%	37%	10%	2%
Waynesboro	-1%	15%	6%	32%	-21%	1%
Winchester	2%	1%	10%	9%	18%	4%
Shenandoah Valley	0%	6%	14%	61%	-2%	2%
Virginia	1%	2%	11%	12%	17%	3%

³⁰ *Data Source:* U.S. Census Bureau, “2010 Census” and “American Community Survey.” It is important to point out that, unlike the decennial census, the annual American Community Survey is indeed a survey. In 2015, only about 1.6 percent of Virginia households were included in the American Community Survey. As a result, the smaller a locality, the more likely this survey is to undercount small subpopulations.

Other Demographic Characteristics

Table 5 provides data for SVWDA and its sixteen localities on six other pertinent demographic characteristics:

- High School Education Attainment: Across the localities of SVWDA, the proportion of individuals 25 years of age and older with a high school degree or above varies from a low of 77 percent in Page County to a high of 88 percent in the Counties of Bath and Clarke. While overall SVWDA has a slightly lower proportion of individuals 25 years of age and older with a high school degree or above than the state of Virginia as a whole (84 percent vs. 88 percent).
- Bachelor's Degree Attainment: Across the localities of SVWDA, the proportion of individuals 25 years of age and older with a bachelor's degree or above varies from a low of 13 percent in Page County to a high of 44 percent in the City of Lexington. While overall SVWDA has a significantly lower proportion of individuals 25 years of age and older with a bachelor's degree or above than the state of Virginia as a whole (25 percent vs. 36 percent).
- Median Household Income: Across the localities of SVWDA, median household income varies from a low of \$29,097 in the City of Buena Vista to a high of \$71,295 in Clarke County. While overall SVWDA has a lower median household income than the state of Virginia as a whole (\$52,635 vs. \$65,015).
- Poverty: Across the localities of SVWDA, the proportion of families below the poverty level varies from a high of 27 percent in the City of Buena Vista to a low of 5 percent in Frederick County. While overall SVWDA has the almost the same proportion of families below the poverty level as the state of Virginia as a whole (9 percent vs. 8 percent).
- Female Households with Children Under 18: Across the localities of SVWDA, the proportion of female households with children under 18 varies from a high of 10 percent in the City of Waynesboro to a low of 3 percent in Highland County. While overall SVWDA has a lower proportion of female households with children under 18 than the state of Virginia as a whole (7 percent vs. 12 percent).
- English Not Spoken at Home: Across the localities of SVWDA, the proportion of individuals five years of age and older for whom English is not spoken at home varies from a high of 24 percent in the City of Harrisonburg to a low of 1 percent in Highland County. While overall SVWDA has a lower proportion of individuals five years of age and older for whom English is not spoken at home than the state of Virginia as a whole (8 percent vs. 15 percent).

Table 5: Other Demographic Characteristics, 2011-2015³¹

Locality	High school graduates, % of persons age 25+	Bachelor's degree or higher, % of persons age 25+	Median household income	% of Families below poverty level	Female households with children under 18	Language other than English spoken at home, % age 5+
Augusta County	86%	22%	\$54,558	7%	6%	3%
Bath County	88%	22%	\$43,646	7%	4%	2%
Clarke County	88%	31%	\$71,295	7%	5%	5%
Frederick County	87%	29%	\$69,098	5%	7%	9%
Highland County	84%	22%	\$43,914	9%	3%	1%
Page County	77%	13%	\$43,895	12%	9%	3%
Rockbridge County	86%	26%	\$48,901	8%	6%	3%
Rockingham County	81%	24%	\$53,744	8%	6%	8%
Shenandoah County	85%	19%	\$49,406	8%	7%	8%
Warren County	86%	21%	\$61,454	7%	7%	5%
Buena Vista	82%	16%	\$29,097	27%	9%	4%
Harrisonburg	84%	36%	\$38,750	13%	7%	24%
Lexington	80%	44%	\$34,017	13%	5%	7%
Staunton	87%	31%	\$40,842	11%	8%	4%
Waynesboro	85%	18%	\$45,643	13%	10%	7%
Winchester	84%	28%	\$45,363	11%	9%	18%
SVWDA	84%	25%	\$52,635	9%	7%	8%
Virginia	88%	36%	\$65,015	8%	12%	15%
United States	87%	30%	\$53,889	11%	8%	21%

³¹ *Data Source:* U.S. Census Bureau, “American Community Survey.” It is important to point out that, unlike the decennial census, the annual American Community Survey is indeed a survey. In 2015, only about 1.6 percent of Virginia households were included in the American Community Survey. As a result, the smaller a locality, the more likely this survey is to undercount small subpopulations.

In Short

With regard to overall employment trends, our analysis has shown that SVWDA has enjoyed steadily rising employment over the last five years and experienced an overall increase of 11,972 jobs, or 5.8 percent in total employment, between the second quarter of 2011 and the second quarter of 2016. At a local level, the largest proportional increases in employment over this period occurred in Frederick County (up 23.0 percent), the City of Buena Vista (up 15.6 percent), and Rockingham County (up 13.1 percent). In addition, unlike at the statewide level where employment growth was disproportionately driven by small business over this period, in SVWDA employment gains were evenly distributed between small and large businesses.

Almost all of the employment increase in SVWDA between the second quarter of 2011 and the second quarter of 2016 was driven by the private sector, which accounted for 11,705 of the 11,972 increase in jobs over the period. At an industry level, the largest increases in private sector employment over this period occurred in the *Health Care and Social Assistance* (up 2,513 jobs), *Transportation and Warehousing* (up 2,217 jobs), and *Accommodation and Food Services* (up 1,889 jobs) sectors. While at the other end of the spectrum, the largest employment losses occurred in the *Manufacturing* (down 828 jobs), *Information* (down 489 jobs), and *Mining* (down 12 jobs) sectors.

With regard to the structure of the regional economy, our analysis has also shown that SVWDA is heavily dependent on the *Manufacturing* sector. At 31,718 jobs in the second quarter of 2016, *Manufacturing* is SVWDA's largest employment sector and its 5th highest paying at \$963 per week. While at 27,532 jobs *Healthcare and Social Assistance* was SVWDA's second largest employment sector that quarter and 9th highest paying at \$858 per week, and at 26,741 jobs *Retail Trade* was SVWDA's third largest employment sector an 17th highest paying at \$488 per week.

From a demographic perspective, our analysis has shown that overall population growth in SVWDA between 2000 and 2015 was comparable to the statewide norm. In addition, just as at the statewide level, that population growth was driven by increases the region's 65 and older population. However, in SVWDA that population shift was further exacerbated by absolute losses in the regions 19 and under population. Finally, population growth in SVWDA between 2000 and 2015 was disproportionately driven by the region's Hispanic and Asian populations.

Key Sectors

In this section, we provide additional detail on four major industry categories that have been designated by SVWDA staff as key employment sectors. Those four sectors are: *Construction*, *Health Care*, *Manufacturing*, and *Transportation and Warehousing*.

Construction

Figure 17 details the change in *Construction* sector private employment in SVWDA for the five-year period from the second quarter of 2011 through the second quarter of 2016. As these data show, employment generally increased over the period, peaking at 10,675 jobs in the third quarter of 2014. Over the period as a whole, employment increased from 9,932 jobs in the second quarter of 2011 to 10,582 jobs in the second quarter of 2016, for a total gain 650 jobs, or a 6.5 percent increase in total employment. By way of comparison, overall private employment increased by 6.9 percent in SVWDA over this period.

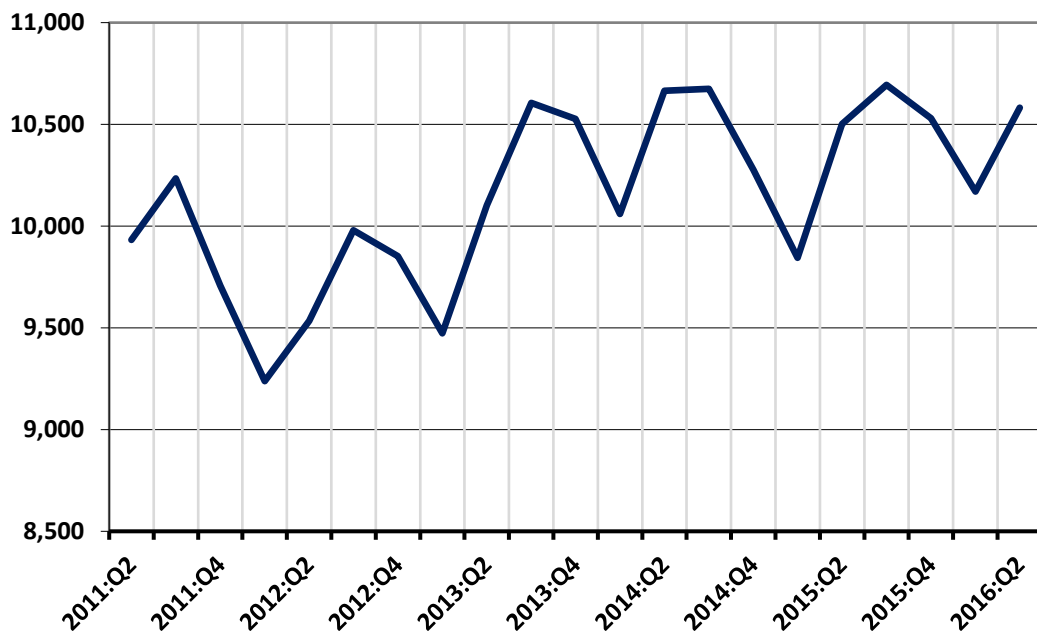


Figure 17: SVWDA Construction Sector Private Employment – 2011:Q2 to 2016:Q2³²

³² Data Source: Virginia Employment Commission, “Quarterly Census of Employment and Wages.”

Figure 18 provides a larger context for these data by benchmarking the year-over-year change in *Construction* sector private employment in SVWDA over this period against the year-over-year change in total private employment in the region. Recall that any observation above the zero line in this graph represents a positive increase in employment from the previous year, while any observation below the zero line represents a decline in employment relative to the previous year. As these data clearly indicate, SVWDA's *Construction* sector was subject to much wider employment swings over the period than the private sector as a whole.

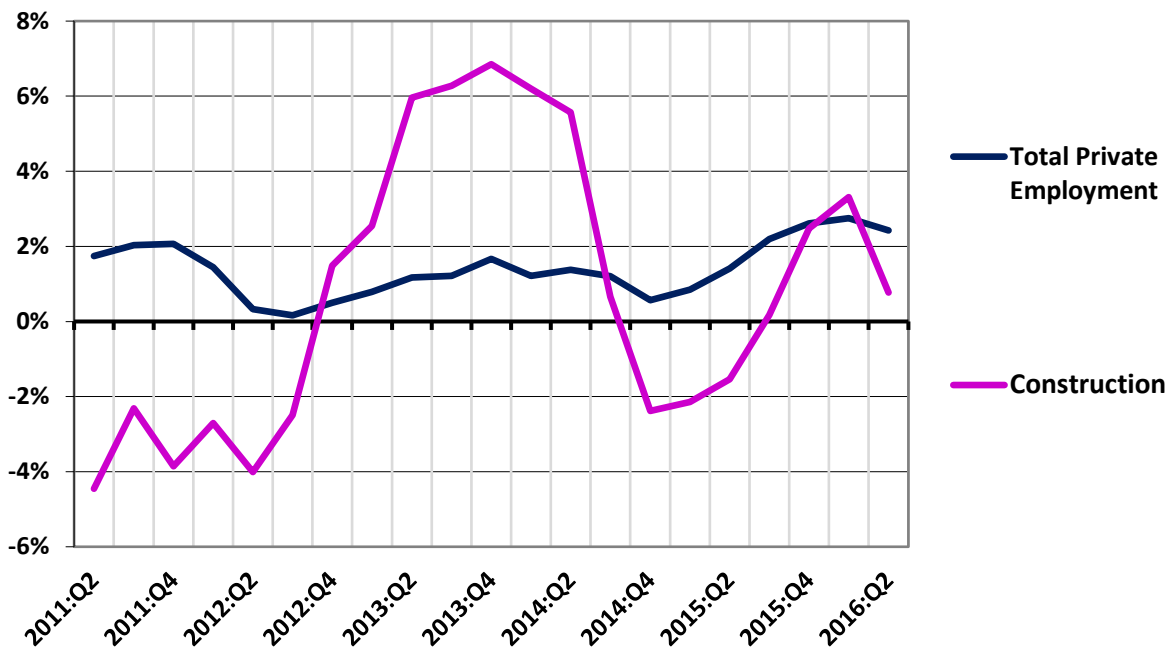


Figure 18: Year-Over-Year Change in Private Employment – 2011:Q2 to 2016:Q2³³

Table 6 provides additional information on the structure of SVWDA's *Construction* sector, by detailing private employment and wages in the second quarter of 2016 at a subsector level. As these data show, there were three subsectors in SVWDA's *Construction* sector that quarter. The largest of which was *Specialty Trade Contractors* (7,068 jobs), while the highest paying was *Heavy and Civil Construction* (\$877 per week).

³³ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

Table 6: Private Employment in SVWDA's *Construction* Sector – 2016:Q2³⁴

Sector and Subsector	Establishments	Employment	Average Weekly Wage
Construction	1,438	10,582	\$805
Construction of Buildings	483	2,752	\$831
Heavy and Civil Engineering Construction	73	763	\$877
Specialty Trade Contractors	882	7,068	\$786

Health Care

Figure 19 provides comparable data on the change in private employment in SVWDA's *Health Care* sector over the five-year period from the second quarter of 2011 through the second quarter of 2016. As these data demonstrate, employment increased initially during period, peaking at 22,430 jobs in the fourth quarter of 2014, before falling to a low of 21,764 jobs in the first quarter of 2015, and then rising to 22,451 jobs in the second quarter of 2016. Over the period as a whole, private employment in SVWDA's *Health Care* sector increased by 1,164 jobs, or by 5.5 percent, as compared to 6.9 percent across all private sector employers.

³⁴ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

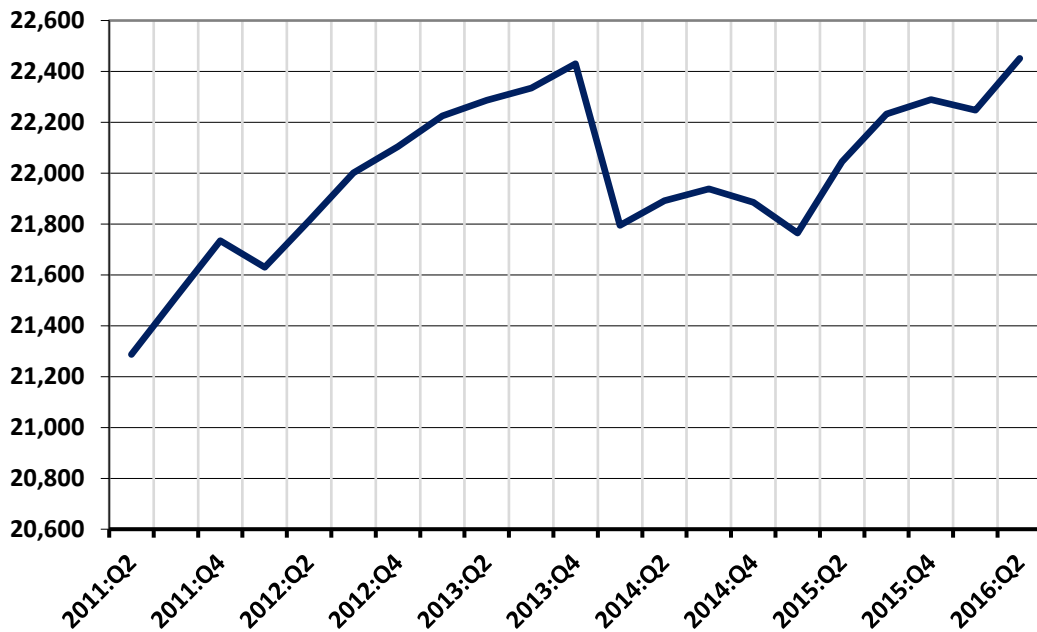


Figure 19: SVWDA Health Care Sector Private Employment – 2011:Q2 to 2016:Q2³⁵

Figure 20 again puts these data in a larger context by benchmarking the year-over-year change in *Health Care* sector private employment in SVWDA against the year-over-year change in total private employment in the region over the same period. As these data show, SVWDA's *Health Care* sector initially out-performed the region's overall private sector. However, as private employment in *Health Care* began to decline in 2014, the sector slipped below the region's overall private sector and has uniformly under-performed the regional norm since. Although it is important to point out that in recent quarters private employment growth in this sector has once again moved into positive territory.

³⁵ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

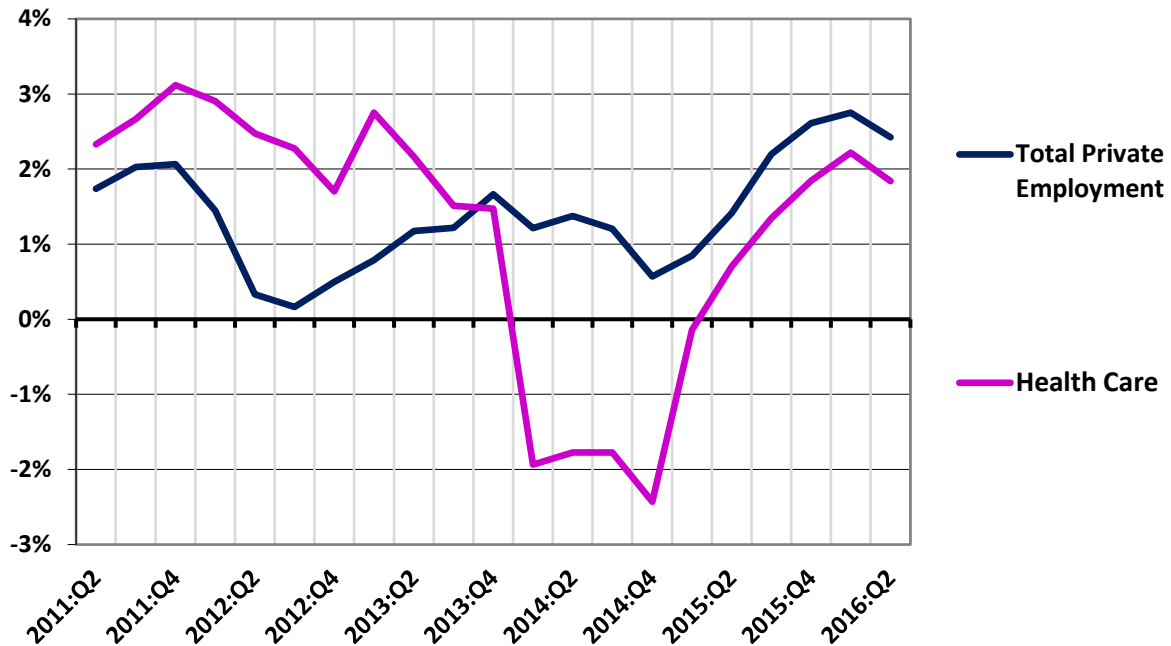


Figure 20: Year-Over-Year Change in Private Employment – 2011:Q2 to 2016:Q2³⁶

Table 7 provides additional detail on the structure of SVWDA’s *Health Care* sector in the second quarter of 2016. As these data indicate, there were three subsectors in SVWDA’s *Health Care* sector that quarter. The largest and highest paying of which was *Hospitals* (8,246 jobs and \$1,150 per week).

³⁶ Data Source: Virginia Employment Commission, “Quarterly Census of Employment and Wages.”

Table 7: Private Employment in SVWDA's Health Care Sector – 2016:Q2³⁷

Sector and Subsector	Establishments	Employment	Average Weekly Wage
Health Care	919	22,451	\$972
Ambulatory Health Care Services	770	8,108	\$1,115
Hospitals	10	8,246	\$1,150
Nursing and Residential Care Facilities	139	6,097	\$543

Manufacturing

Figure 21 provides data on the five-year change in private employment in SVWDA's *Manufacturing* sector between the second quarter of 2011 through the second quarter of 2016. As these data show, regional private employment in this sector declined steadily from a peak of 32,735 jobs in the third quarter of 2011 to a low of 30,806 jobs in the first quarter of 2011. It has since rebounded slowly, and reached 31,718 jobs in the second quarter of 2016. Overall, private employment in SVWDA's *Manufacturing* sector decreased by 828 jobs, or by minus 2.5 percent, over the period, in contrast to a 6.9 percent increase across all private sector employers.

³⁷ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

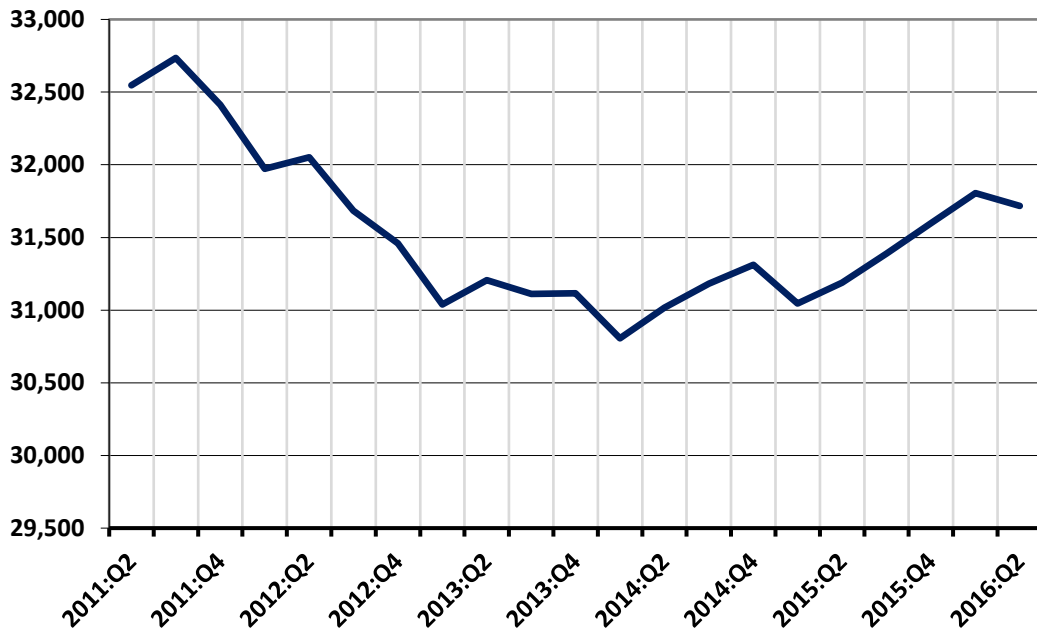


Figure 21: SVWDA *Manufacturing* Sector Private Employment – 2011:Q2 to 2016:Q2³⁸

Figure 22 benchmarks the year-over-year change in private employment in SVWDA’s *Manufacturing* sector against the year-over-year change in total private employment in the region over the same period. As these data indicate, SVWDA’s *Manufacturing* sector underperformed the region’s overall private sector throughout the period, although that gap in performance closed substantially starting in late 2013 as employment growth in this sector once again moved into positive territory.

³⁸ Data Source: Virginia Employment Commission, “Quarterly Census of Employment and Wages.”

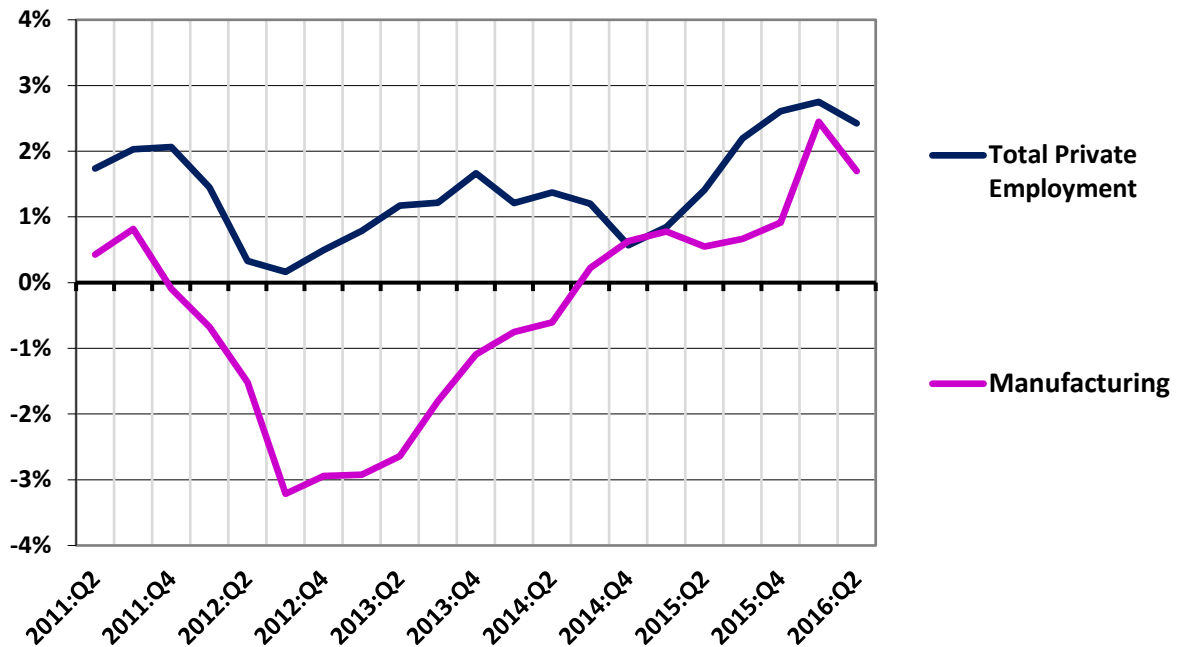


Figure 22: Year-Over-Year Change in Private Employment – 2011:Q2 to 2016:Q2³⁹

Table 8 provides further detail on the structure of SVWDA’s *Manufacturing* sector in the second quarter of 2016. As these data show, there were 16 subsectors in SVWDA’s *Manufacturing* sector that quarter. Of which *Food Manufacturing* (10,161 jobs) was the largest, and *Chemical Manufacturing* (\$1,642 per week) was the highest paying.

³⁹ Data Source: Virginia Employment Commission, “Quarterly Census of Employment and Wages.”

Table 8: Private Employment in SVWDA's Manufacturing Sector – 2016:Q2⁴⁰

Sector and Subsector	Establishments	Employment	Average Weekly Wage
Manufacturing	540	31,718	\$963
Beverage and Tobacco Product Manufacturing	20	738	\$1,164
Chemical Manufacturing	19	1,926	\$1,642
Computer and Electronic Product Manufacturing	20	576	\$849
Electrical Equipment, Appliance, and Components	7	16	\$572
Fabricated Metal Product Manufacturing	74	2,515	\$965
Food Manufacturing	72	10,161	\$860
Furniture and Related Product Manufacturing	41	672	\$630
Machinery Manufacturing	32	1,574	\$1,099
Miscellaneous Manufacturing	42	846	\$999
Nonmetallic Mineral Product Manufacturing	38	1,074	\$999
Paper Manufacturing	9	876	\$983

⁴⁰ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

Table 8: Private Employment in SVWDA's Manufacturing Sector – 2016:Q2⁴⁰

Sector and Subsector	Establishments	Employment	Average Weekly Wage
Manufacturing	540	31,718	\$963
Petroleum and Coal Products Manufacturing	4	110	\$988
Plastics and Rubber Products Manufacturing	32	3,905	\$1,104
Primary Metal Manufacturing	10	542	\$828
Printing and Related Support Activities	45	2,819	\$804
Wood Product Manufacturing	51	1,469	\$723

Transportation and Warehousing

Lastly, Figure 23 details the change in private employment in SVWDA's *Transportation and Warehousing* sector over the five-year period from the second quarter of 2011 through the second quarter of 2016. As these data demonstrate, employment in this sector increased steadily over the period, rising from 8,832 jobs in the second quarter of 2011 to 11,049 jobs in the second quarter of 2016. Overall, SVWDA's *Transportation and Warehousing* sector experienced an increase of 2,217 jobs over the period, or a 25.1 percent increase in employment – nearly four times the 6.9 percent employment increase the region experienced across all private sector employers.

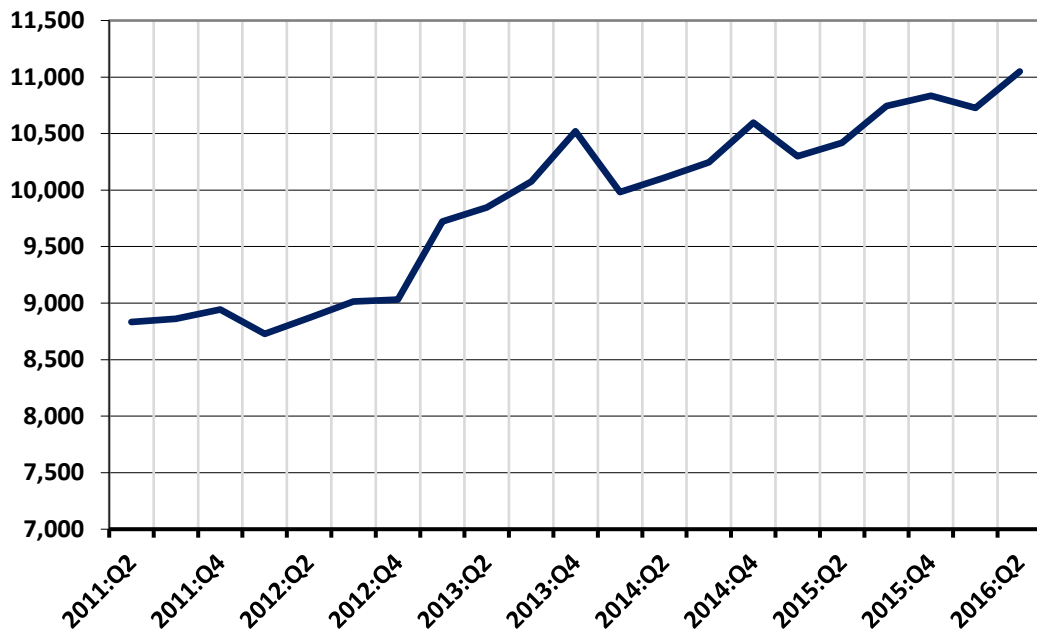


Figure 23: SVWDA Transportation and Warehousing Sector Private Employment – 2011:Q2 to 2016:Q2⁴¹

Figure 24 once again puts these data in a larger context by benchmarking the year-over-year change in *Transportation and Warehousing* sector private employment in SVWDA between the second quarter of 2011 and the second quarter of 2016 against comparable data for total private employment. As these data show, this sector substantially out-performed the region's overall private sector over much of the period.

⁴¹ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

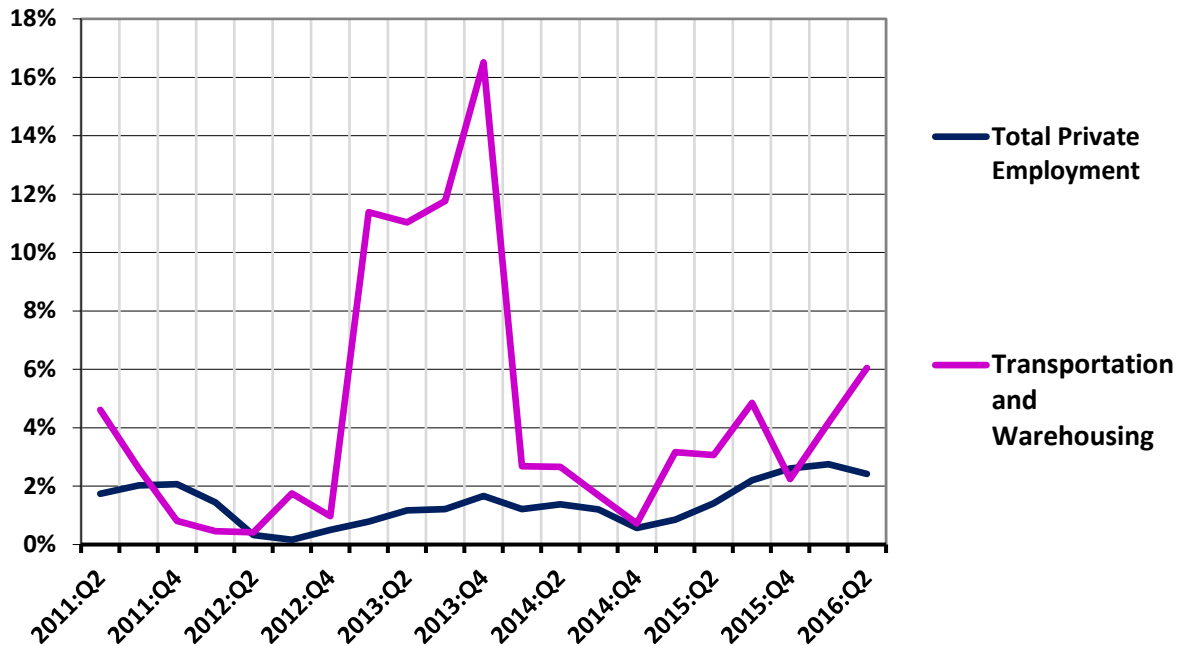


Figure 24: Year-Over-Year Change in Private Employment – 2011:Q2 to 2016:Q2⁴²

Table 9 provides a drilldown of SVWDA’s *Transportation and Warehousing* sector by subsector. As these data indicate, there were six subsectors in SVWDA’s *Transportation and Warehousing* sector in the second quarter of 2016. The largest of which was *Warehousing and Storage* (4,963 jobs) and the highest paying of which was *Pipeline Transportation* (\$1,736 per week).

⁴² Data Source: Virginia Employment Commission, “Quarterly Census of Employment and Wages.”

Table 9: Private Employment in SVWDA's Transportation and Warehousing Sector – 2016:Q2⁴³

Sector and Subsector	Establishments	Employment	Average Weekly Wage
Health Care	441	11,049	\$823
Couriers and Messengers	34	845	\$853
Pipeline Transportation	3	36	\$1,736
Support Activities for Transportation	50	415	\$574
Transit and Ground Passenger Transportation	16	187	\$459
Truck Transportation	279	4,057	\$881
Warehousing and Storage	49	4,963	\$766

In Short

SVWDA staff have identified four key employment sectors within the region. Those four sectors are: *Construction, Health Care, Manufacturing, and Transportation and Warehousing*. Our analysis of employment performance in these sectors has shown that:

- SVWDA's *Construction* sector experienced a 6.5 percent increase in private employment over the last five years as compared to a 6.9 percent increase across all private sector industries. However, year-over-year employment growth varied widely over the period and since the fourth quarter of 2014 has under-performed the region's overall growth in private sector employment.

⁴³ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

- SVWDA's *Health Care* sector experienced a 5.5 percent increase in private employment over the last five years as compared to a 6.9 percent increase across all private sector industries. However, year-over-year employment growth in this industry has under-performed the region's overall growth in private sector employment since the fourth quarter of 2013. Although it is important to point out that in recent quarters private employment growth in this sector has once again moved into positive territory.
- SVWDA's *Manufacturing* sector experienced a 2.5 percent decline in private employment over the last five years in contrast to a 6.9 percent increase across all private sector industries. In addition, year-over-year employment growth in this industry has under-performed the region's overall growth in private sector employment throughout the period, although that gap in performance closed substantially starting in late 2013 as employment growth in this sector once again moved into positive territory.
- SVWDA's *Transportation and Warehousing* sector experienced a 25.1 percent increase in private employment over the last five years as compared to a 6.9 percent increase across all private sector industries. In addition, this sector substantially out-performed the region's overall private sector over much of the period.

Industry Performance

In this section, we provide an assessment of the economic performance of each of SVWDA's major industry sectors, as well as the industry sub-sectors associated with the region's four key employment sectors. That assessment is based on the following performance metrics:

- *1 yr. Employment Growth* refers to the percentage growth in industry employment in the region between the second quarter of 2015 and the second quarter of 2016.⁴⁴
- *Relative to Total Employment Growth in Region* benchmarks the industry's employment growth against the region's total employment growth over the same period (a number above one indicates the industry grew faster than total employment in the region, a number below one indicates that it grew slower than total employment in the region, and n/a indicates that data are not available or one of the "growth" rates was negative).⁴⁵
- *Relative to Industry Employment Growth in State* benchmarks the industry's regional employment growth against employment growth in that industry at the state-wide level over the same period (a number above one indicates that the industry grew faster in the

⁴⁴ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

⁴⁵ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

region than at the state-wide level, a number below one indicates that it grew slower in the region than at the state-wide level, and n/a indicates that data are not available or one of the “growth” rates was negative).⁴⁶

- *5 yr. Employment Growth* refers to the percentage growth in industry employment in the region between the second quarter of 2011 and the second quarter of 2016.⁴⁷
- *Relative to Total Employment Growth in Region* benchmarks the industry’s employment growth against the region’s total employment growth over the same period (a number above one indicates the industry grew faster than total employment in the region, a number below one indicates that it grew slower than total employment in the region, and n/a indicates that data are not available or one of the “growth” rates was negative).⁴⁸
- *Relative to Industry Employment Growth in State* benchmarks the industry’s regional employment growth against employment growth in that industry at the state-wide level over the same period (a number above one indicates that the industry grew faster in the region than at the state-wide level, a number below one indicates that it grew slower in the region than at the state-wide level, and n/a indicates that data are not available or one of the “growth” rates was negative).⁴⁹
- *1 yr. Wage Growth* refers to the percentage growth in industry wage in the region between the first quarter of 2015 and the first quarter of 2016.⁵⁰
- *Relative to Average Wage Growth in Region* benchmarks the industry’s wage growth against the region’s average wage growth over the same period (a number above one indicates that industry wage grew faster than the average wage in the region, a number below one indicates that it grew slower than the average wage in the region, and n/a indicates that data are not available or one of the “growth” rates was negative).⁵¹
- *Relative to Industry Wage Growth in State* benchmarks the industry’s regional wage growth against state-wide wage growth in that industry over the same period (a number above one indicates that industry wage grew faster in the region than at the state-wide level, a number below one indicates that it grew slower in the region than at the state-wide level, and N/A indicates that data are not available or one of the “growth” rates was negative).⁵²
- *5 yr. Wage Growth* refers to the percentage growth in industry wage in the region between the first quarter of 2011 and the first quarter of 2016.

⁴⁶ Data Source: Virginia Employment Commission, “Quarterly Census of Employment and Wages.”

⁴⁷ Data Source: Virginia Employment Commission, “Quarterly Census of Employment and Wages.”

⁴⁸ Data Source: Virginia Employment Commission, “Quarterly Census of Employment and Wages.”

⁴⁹ Data Source: Virginia Employment Commission, “Quarterly Census of Employment and Wages.”

⁵⁰ Data Source: Virginia Employment Commission, “Quarterly Census of Employment and Wages.”

⁵¹ Data Source: Virginia Employment Commission, “Quarterly Census of Employment and Wages.”

⁵² Data Source: Virginia Employment Commission, “Quarterly Census of Employment and Wages.”

- *Relative to Average Wage Growth in Region* benchmarks the industry's wage growth against the region's average wage growth over the same period (a number above one indicates that industry wage grew faster than the average wage in the region, a number below one indicates that it grew slower than the average wage in the region, and n/a indicates that data are not available or one of the "growth" rates was negative).⁵³
- *Relative to Industry Wage Growth in State* benchmarks the industry's regional wage growth against state-wide wage growth in that industry over the same period (a number above one indicates that industry wage grew faster in the region than at the state-wide level, a number below one indicates that it grew slower in the region than at the state-wide level, and n/a indicates that data are not available or one of the "growth" rates was negative).⁵⁴
- *Location Quotient – Employment* measures the relative size of an industry's employment footprint within a region. Specifically, it is calculated as industry employment in the region as a proportion of total regional employment, divided by industry employment in the state as a proportion of total state employment.⁵⁵
- *Location Quotient – Establishments* measures the relative size of an industry's establishment footprint within a region. Specifically, it is calculated as the number of industry establishments in the region as a proportion of the total number of establishments in the region, divided by the number of industry establishments in the state as a proportion of total number of establishments in the state.⁵⁶
- *Industry Output as a Percentage of Regional Output* measures industry output as a percentage of regional output.⁵⁷
- *Proportion of Industry Output Exported* measures the percentage of an industry's output that is exported out of the region.⁵⁸
- *Industry Exports as a Percentage of Regional Exports* measures the industry's exports as a proportion of total regional exports.⁵⁹
- *Type 1 Multiplier Ratio (Multiplier)* measures the economic ripple, or Keynesian multiplier, effects that an industry has on the regional economy.⁶⁰

⁵³ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

⁵⁴ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

⁵⁵ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

⁵⁶ Data Source: Virginia Employment Commission, "Quarterly Census of Employment and Wages."

⁵⁷ Data Source: IMPLAN.

⁵⁸ Data Source: IMPLAN.

⁵⁹ Data Source: IMPLAN.

⁶⁰ Data Source: IMPLAN.

Major Industry Sectors

In this portion of the section, we assess the performance of major industry sectors in SVWDA. Table 10A provides detail on the employment performance of major industry sectors in SVWDA. As these data show, the largest regional short-term (one-year) employment growth occurred in *Transportation and Warehousing* (6.0 percent), *Finance and Insurance* (4.7 percent), and *Educational Services* (3.5 percent). In addition, *Transportation and Warehousing* exhibited regional one-year employment growth that was greater than the regional average across all industries, and *Finance and Insurance* and *Educational Services*, along with *Retail Trade* and *Wholesale Trade*, also exhibited regional one-year employment growth that was greater than the state-wide average for their industries.

With regard to long-term (five-year) employment growth, the largest increases occurred in *Management of Companies and Enterprises* (30.8 percent), *Agriculture* (29.2 percent), and *Transportation and Warehousing* (25.1 percent). In addition, at a regional level these three industries, along with *Finance and Insurance*, exhibited regional five-year employment growth that was greater than the regional average across all industries, and *Agriculture; Professional, Scientific, and Technical Services; Real Estate; Educational Services; and Finance and Insurance* also exhibited regional five-year employment growth that was greater than the state-wide average for their industries.

Table 10A: Employment Performance of Major Industry Sectors in SVWDA

Industry	1 yr. Emp. Growth	Relative to Total Emp. Growth in Region	Relative to Industry Emp. Growth in State	5 yr. Emp. Growth	Relative to Total Emp. Growth in Region	Relative to Industry Emp. Growth in State
Accommodation and Food Services	2.1%	0.86	0.57	8.9%	1.29	0.66
Administrative and Support and Waste Management	0.9%	0.36	0.53	2.8%	0.40	0.21
Agriculture, Forestry, Fishing and Hunting	-0.6%	n/a	n/a	29.2%	4.24	2.67

Table 10A: Employment Performance of Major Industry Sectors in SVWDA

Industry	1 yr. Emp. Growth	Relative to Total Emp. Growth in Region	Relative to Industry Emp. Growth in State	5 yr. Emp. Growth	Relative to Total Emp. Growth in Region	Relative to Industry Emp. Growth in State
Arts, Entertainment, and Recreation	-2.9%	n/a	n/a	1.3%	0.19	0.10
Construction	0.8%	0.32	0.53	6.5%	0.95	1.29
Educational Services	3.5%	1.43	2.20	5.8%	0.84	3.01
Finance and Insurance	4.7%	1.93	2.53	25.0%	3.63	2.58
Health Care and Social Assistance	3.0%	1.22	0.89	10.0%	1.46	0.82
Information	0.9%	0.38	n/a	-15.5%	n/a	n/a
Management of Companies and Enterprises	3.2%	1.34	n/a	30.8%	4.48	
Manufacturing	1.7%	0.70	n/a	-2.5%	n/a	n/a
Mining, Quarrying, and Oil and Gas Extraction	-3.1%	n/a	n/a	-4.1%	n/a	n/a
Other Services (except Public Administration)	2.0%	0.84	0.74	4.2%	0.61	0.60
Professional, Scientific, and Technical Services	0.4%	0.17	0.14	24.4%	3.55	4.94
Real Estate and Rental and Leasing	-0.2%	n/a	n/a	14.5%	2.10	3.86
Retail Trade	2.3%	0.96	2.99	1.3%	0.18	0.31
Transportation and Warehousing	6.0%	2.49	1.08	25.1%	3.65	1.56
Utilities	-0.2%	n/a	n/a	5.7%	0.83	n/a

Table 10A: Employment Performance of Major Industry Sectors in SVWDA

Industry	1 yr. Emp. Growth	Relative to Total Emp. Growth in Region	Relative to Industry Emp. Growth in State	5 yr. Emp. Growth	Relative to Total Emp. Growth in Region	Relative to Industry Emp. Growth in State
Wholesale Trade	2.4%	0.97	7.40	8.2%	1.19	n/a

Table 10B provides similar information on the wage performance of major industry sectors in SVWDA. As these data show, the largest regional short-term (one-year) wage growth occurred in *Real Estate* (7.9 percent), *Arts, Entertainment, and Recreation* (4.9 percent), and *Mining* (4.7 percent). In addition, all three of these industries exhibited regional one-year wage growth that was greater than the regional average across all industries, and *Real Estate*, along with *Transportation and Warehousing*; *Wholesale Trade*; and *Professional, Scientific, and Technical Services* also exhibited regional one-year wage growth that was greater than the state-wide average for their industries.

With regard to long-term (five-year) wage growth, the largest increases occurred in *Management of Companies and Enterprises* (52.4 percent), *Utilities* (24.6 percent), and *Mining* (20.8 percent). In addition, all three of these industries exhibited regional five-year wage growth that was greater than the regional average across all industries, and *Management of Companies and Enterprises*; *Utilities*; *Educational Services*; *Professional, Scientific, and Technical Services*; *Wholesale Trade*; and *Retail Trade* also exhibited regional five-year wage growth that was greater than the state-wide average for their industries.

Table 10B: Wage Performance of Major Industry Sectors in SVWDA

Industry	1 yr. Wage Growth	Relative to Avg. Wage Growth in Region	Relative to Industry Wage Growth in State	5 yr. Wage Growth	Relative to Avg. Wage Growth in Region	Relative to Industry Wage Growth in State
Accommodation and Food Services	2.6%	1.2	1.1	13.3%	1.1	1.2
Administrative and Support and Waste Management	4.5%	2.0	1.4	10.2%	0.9	1.3
Agriculture, Forestry, Fishing and Hunting	1.3%	0.6	0.5	13.8%	1.2	1.0
Arts, Entertainment, and Recreation	4.9%	2.2	1.4	11.9%	1.0	0.6
Construction	0.2%	0.1	0.2	14.7%	1.2	1.4
Educational Services	1.3%	0.6	0.8	8.7%	0.7	3.2
Finance and Insurance	-2.0%	n/a	n/a	16.4%	1.4	0.8
Health Care and Social Assistance	2.6%	1.2	0.7	4.4%	0.4	0.6
Information	-9.3%	n/a	n/a	-1.5%	n/a	n/a
Management of Companies and Enterprises	2.6%	1.1	n/a	52.4%	4.4	7.1
Manufacturing	3.5%	1.6	n/a	14.6%	1.2	2.2
Mining, Quarrying, and Oil and Gas Extraction	4.7%	2.1	n/a	20.8%	1.7	n/a
Other Services (except Public Administration)	-1.9%	n/a	n/a	12.7%	1.1	1.1

Table 10B: Wage Performance of Major Industry Sectors in SVWDA

Industry	1 yr. Wage Growth	Relative to Avg. Wage Growth in Region	Relative to Industry Wage Growth in State	5 yr. Wage Growth	Relative to Avg. Wage Growth in Region	Relative to Industry Wage Growth in State
Professional, Scientific, and Technical Services	2.6%	1.2	2.6	11.3%	0.9	2.6
Real Estate and Rental and Leasing	7.9%	3.6	3.2	17.7%	1.5	1.1
Retail Trade	1.5%	0.7	0.5	8.4%	0.7	0.8
Transportation and Warehousing	3.3%	1.5	14.8	2.7%	0.2	0.3
Utilities	2.6%	1.2	n/a	24.6%	2.0	4.7
Wholesale Trade	3.9%	1.8	3.9	16.6%	1.4	2.2

Table 10C provides data on other performance measures for the major industry sectors in SVWDA. As these data show, in regard to:

- Location Quotient for Employment: the major industry sectors with the largest relative employment footprint in SVWDA in the second quarter of 2016 were *Agriculture* (2.8), *Manufacturing* (2.3), and *Transportation and Warehousing* (1.7).
- Location Quotient for Establishments: the major industry sectors with the largest relative establishment footprint in SVWDA in the second quarter of 2016 were *Agriculture* (2.8), *Manufacturing* (1.6), and *Transportation and Warehousing* and *Utilities* (1.5).
- Industry Output as a Percentage of Regional Output: the major industry sectors that accounted for the largest percentage of regional output in SVWDA in the second quarter of 2016 were *Manufacturing* (31.7 percent), *Construction* (7.0 percent), and *Health Care and Social Assistance* (6.7 percent).
- Proportion of Industry Output Exported: the major industry sectors that exported the largest percentage of their output in SVWDA in the second quarter of 2016 were *Manufacturing* (88.7 percent), *Transportation and Warehousing* (37.7 percent), and *Agriculture* (33.8 percent).

- Industry Exports as a Percentage of Regional Exports: the major industry sectors that accounted for the largest percentage of regional exports in SVWDA in the second quarter of 2016 were *Manufacturing* (79.2 percent), *Transportation and Warehousing* (4.4 percent), and *Agriculture* (3.3 percent).
- Type 1 Multiplier Ratio (Multiplier): the major industry sectors with the largest relative economic impact on SVWDA in the second quarter of 2016 were *Finance and Insurance* (1.5), *Arts, Entertainment, and Recreation* (1.5), and *Agriculture and Construction* (1.4).

Table 10C: Other Performance of Major Industry Sectors in SVWDA

Industry	LQ Emp.	LQ Est.	% of Regional Output	Industry Output Exported	% of Regional Exports	Type 1 Mult.
Accommodation and Food Services	1.1	1.2	3.2%	23.6%	2.0%	1.3
Administrative and Support and Waste Management	0.6	0.8	1.5%	9.1%	0.4%	1.2
Agriculture, Forestry, Fishing and Hunting	2.8	2.4	3.6%	33.8%	3.3%	1.4
Arts, Entertainment, and Recreation	0.8	1.0	0.8%	18.8%	0.4%	1.5
Construction	1.0	1.3	7.0%	3.4%	0.6%	1.4
Educational Services	1.5	0.8	1.1%	27.5%	0.8%	1.3
Finance and Insurance	0.7	1.1	3.6%	13.8%	1.3%	1.5
Health Care and Social Assistance	1.1	1.3	6.7%	8.6%	1.5%	1.2
Information	0.7	0.8	2.8%	18.6%	1.4%	1.3
Management of Companies and Enterprises	0.7	0.6	1.2%	4.6%	0.2%	1.3
Manufacturing	2.3	1.6	31.7%	88.7%	75.2%	1.3
Mining, Quarrying, and Oil and Gas Extraction	0.8	1.0	0.3%	27.9%	0.2%	1.3

Table 10C: Other Performance of Major Industry Sectors in SVWDA

Industry	LQ Emp.	LQ Est.	% of Regional Output	Industry Output Exported	% of Regional Exports	Type 1 Mult.
Other Services (except Public Administration)	0.7	0.9	1.9%	5.0%	0.3%	1.2
Professional, Scientific, and Technical Services	0.3	0.5	3.8%	8.6%	0.9%	1.3
Real Estate and Rental and Leasing	0.8	0.9	3.7%	4.4%	0.4%	1.3
Retail Trade	1.1	1.3	5.1%	11.8%	1.6%	1.3
Transportation and Warehousing	1.7	1.5	4.3%	37.7%	4.4%	1.3
Utilities	1.0	1.5	1.6%	16.2%	0.7%	1.3
Wholesale Trade	0.9	0.8	3.6%	0.2%	0.0%	1.3

Key Sectors

In this portion of the section, we assess the performance of subsectors within the four key employment sectors that have been identified by SVWDA personnel. Table 11A provides detail on the employment performance of these subsectors in SVWDA. As these data show, the largest regional short-term (one-year) employment growth in:

- *Construction*: occurred in the subsector *Specialty Trade Contractors* (3.3 percent) which also exhibited regional one-year employment growth that was greater than the regional average across all industries, and greater than the state-wide average for this subsector.
- *Health Care*: occurred in the subsector *Nursing and Residential Care Facilities* (6.0 percent) which also exhibited regional one-year employment growth that was greater than the regional average across all industries, and greater than the state-wide average for this subsector.
- *Manufacturing*: occurred in the subsectors *Petroleum and Coal Products Manufacturing* (17.0 percent), *Nonmetallic Mineral Product Manufacturing* (14.9 percent), and *Electrical Equipment, Appliance, and Component Manufacturing* (14.3 percent). All three of these subsectors also exhibited regional one-year employment growth that was

greater than the regional average across all industries, and (with the exception of *Petroleum and Coal Products Manufacturing* for which data were not available) greater than the state-wide average for these subsectors.

- *Transportation and Warehousing*: occurred in the subsectors *Support Activities for Transportation and Warehousing and Storage* (11.0 percent). In addition, both of these subsectors also exhibited regional one-year employment growth that was greater than the regional average across all industries.

With regard to long-term (five-year) employment growth, the largest increases in:

- *Construction*: occurred in the subsector *Heavy and Civil Engineering Construction* (8.7 percent) which also exhibited regional five-year employment growth that was greater than the regional average across all industries.
- *Health Care*: occurred in the subsector *Ambulatory Health Care Services* (12.7 percent) which also exhibited regional five-year employment growth that was greater than the regional average across all industries.
- *Manufacturing*: occurred in the subsectors *Paper Manufacturing* (25.7 percent), and *Nonmetallic Mineral Product Manufacturing* (20.7 percent). In addition, both of these subsectors exhibited regional five-year employment growth that was greater than the regional average across all industries, and greater than the state-wide average for these subsectors.
- *Transportation and Warehousing*: occurred in the subsectors *Warehousing and Storage* (44.6 percent) and *Couriers and Messengers* (24.1 percent). In addition, both of these subsectors also exhibited regional five-year employment growth that was greater than the regional average across all industries, and *Couriers and Messengers* exhibited regional five-year employment growth that was greater than the state-wide average for this subsector.

Table 11A: Employment Performance of Key Industry Subsectors in SVWDA

Industry and Subsector	1 yr. Emp. Growth	Relative to Total Emp. Growth in Region	Relative to Industry Emp. Growth in State	5 yr. Emp. Growth	Relative to Total Emp. Growth in Region	Relative to Industry Emp. Growth in State
Construction						
Construction of Buildings	2.7%	1.1	0.9	5.0%	0.7	0.7
Heavy and Civil Engineering Construction	-22.0%	n/a	n/a	8.7%	1.3	n/a
Specialty Trade Contractors	3.3%	1.4	1.7	6.9%	1.0	1.1
Health Care						
Ambulatory Health Care Services	0.5%	0.2	0.1	12.7%	1.9	0.8
Hospitals	0.3%	0.1	0.1	-4.9%	n/a	n/a
Nursing and Residential Care Facilities	6.0%	2.5	2.8	12.4%	1.8	1.4
Manufacturing						
Food Manufacturing	0.5%	0.2	0.2	0.7%	0.1	0.4
Beverage and Tobacco Product Manufacturing	10.3%	4.3	1.0	2.9%	0.4	0.1
Wood Product Manufacturing	6.4%	2.6	28.7	-12.6%	n/a	n/a
Paper Manufacturing	5.2%	2.1	4.6	25.7%	3.7	6.1
Printing and Related Support Activities	-2.0%	n/a	n/a	-9.4%	n/a	n/a

Table 11A: Employment Performance of Key Industry Subsectors in SVWDA

Industry and Subsector	1 yr. Emp. Growth	Relative to Total Emp. Growth in Region	Relative to Industry Emp. Growth in State	5 yr. Emp. Growth	Relative to Total Emp. Growth in Region	Relative to Industry Emp. Growth in State
Petroleum and Coal Products Manufacturing	17.0%	7.0	n/a	3.8%	0.5	0.9
Chemical Manufacturing	1.0%	0.4	35.4	-8.8%	n/a	n/a
Plastics and Rubber Products Manufacturing	-4.2%	n/a	n/a	1.7%	0.3	0.4
Nonmetallic Mineral Product Manufacturing	14.9%	6.1	15.8	20.7%	3.0	4.9
Primary Metal Manufacturing	0.7%	0.3	0.2	-21.4%	n/a	n/a
Fabricated Metal Product Manufacturing	3.2%	1.3	n/a	0.1%	0.0	n/a
Machinery Manufacturing	2.9%	1.2	n/a	-5.0%	n/a	n/a
Computer and Electronic Product Manufacturing	-0.3%	n/a	n/a	4.9%	0.7	n/a
Electrical Equipment, Appliance, and Component Manufacturing	14.3%	5.9	20.9	-88.7%	n/a	n/a
Furniture and Related Product Manufacturing	9.6%	4.0	3.3	-11.8%	n/a	n/a
Miscellaneous Manufacturing	0.7%	0.3	0.1	6.8%	1.0	0.4

Table 11A: Employment Performance of Key Industry Subsectors in SVWDA

Industry and Subsector	1 yr. Emp. Growth	Relative to Total Emp. Growth in Region	Relative to Industry Emp. Growth in State	5 yr. Emp. Growth	Relative to Total Emp. Growth in Region	Relative to Industry Emp. Growth in State
Transportation and Warehousing						
Truck Transportation	0.0%	0.0	n/a	12.6%	1.8	2.0
Transit and Ground Passenger Transportation	-1.1%	n/a	n/a	12.0%	1.7	0.7
Pipeline Transportation	2.9%	1.2	n/a	5.9%	0.9	0.3
Support Activities for Transportation	11.0%	4.5	n/a	-8.6%	n/a	n/a
Couriers and Messengers	7.5%	3.1	1.5	24.1%	3.5	1.6
Warehousing and Storage	11.0%	4.5	0.5	44.6%	6.5	0.9

Table 11B provides similar information on the wage performance of the subsectors within SVWDA's identified key employment sectors. As these data show, the largest regional short-term (one-year) wage growth in:

- *Construction*: occurred in the subsector *Construction of Buildings* (3.5 percent) which also exhibited regional one-year wage growth that was greater than the regional average across all industries, and greater than the state-wide average for this subsector.
- *Health Care*: occurred in the subsector *Hospitals* (5.4 percent) which also exhibited regional one-year wage growth that was greater than the regional average across all industries.
- *Manufacturing*: occurred in the subsectors *Nonmetallic Mineral Product Manufacturing* (13.7 percent), and *Paper Manufacturing* (11.2 percent). In addition, both of these subsectors also exhibited regional one-year wage growth that was greater than the

regional average across all industries, and greater than the state-wide average for these subsectors.

- *Transportation and Warehousing*: occurred in the subsectors *Transit and Ground Passenger Transportation* (8.3 percent) and *Warehousing and Storage* (6.4 percent). In addition, both of these subsectors also exhibited regional one-year wage growth that was greater than the regional average across all industries, and *Transit and Ground Passenger Transportation* also exhibited regional one-year wage growth greater than the state-wide average for this subsector.

With regard to long-term (five-year) wage growth, the largest increases in:

- *Construction*: occurred in the subsector *Heavy and Civil Engineering Construction* (17.7 percent) which also exhibited regional five-year wage growth that was greater than the regional average across all industries and the state-wide average for this subsector.
- *Health Care*: occurred in the subsector *Nursing and Residential Care Facilities* (13.4 percent) which also exhibited regional five-year wage growth that was greater than the regional average across all industries and the state-wide average for this subsector.
- *Manufacturing*: occurred in the subsectors *Nonmetallic Mineral Product Manufacturing* (23.6 percent), *Food Manufacturing* (23.0 percent), and *Paper Manufacturing* (20.8 percent). In addition, all three of these subsectors exhibited regional five-year wage growth that was greater than the regional average across all industries, and greater than the state-wide average for these subsectors.
- *Transportation and Warehousing*: occurred in the subsectors *Transit and Ground Passenger Transportation* (42.1 percent) and *Pipeline Transportation* (24.6 percent). In addition, both of these subsectors also exhibited regional five-year wage growth that was greater than the regional average across all industries, and greater than the state-wide average for these subsectors.

Table 11B: Wage Performance of Key Industry Subsectors in SVWDA

Industry and Subsector	1 yr. Wage Growth	Relative to Avg. Wage Growth in Region	Relative to Industry Wage Growth in State	5 yr. Wage Growth	Relative to Avg. Wage Growth in Region	Relative to Industry Wage Growth in State
Construction						
Construction of Buildings	3.5%	1.6	2.2	12.8%	1.1	1.2
Heavy and Civil Engineering Construction	-11.1%	n/a	n/a	17.7%	1.5	4.0
Specialty Trade Contractors	1.0%	0.5	0.5	14.9%	1.2	1.2
Health Care						
Ambulatory Health Care Services	3.9%	1.8	1.1	1.4%	0.1	0.2
Hospitals	5.4%	2.4	0.8	13.2%	1.1	1.1
Nursing and Residential Care Facilities	0.9%	0.4	0.4	13.4%	1.1	2.5
Manufacturing						
Food Manufacturing	5.8%	2.6	11.5	23.0%	1.9	2.3
Beverage and Tobacco Product Manufacturing	-14.9%	n/a	n/a	-1.2%	n/a	n/a
Wood Product Manufacturing	6.0%	2.7	1.6	15.9%	1.3	1.1
Paper Manufacturing	11.2%	5.0	7.8	20.8%	1.7	2.8
Printing and Related Support Activities	4.3%	1.9	1.9	12.3%	1.0	1.4

Table 11B: Wage Performance of Key Industry Subsectors in SVWDA

Industry and Subsector	1 yr. Wage Growth	Relative to Avg. Wage Growth in Region	Relative to Industry Wage Growth in State	5 yr. Wage Growth	Relative to Avg. Wage Growth in Region	Relative to Industry Wage Growth in State
Petroleum and Coal Products Manufacturing	2.0%	0.9	0.3	-3.1%	n/a	n/a
Chemical Manufacturing	-1.6%	n/a	n/a	9.5%	0.8	0.8
Plastics and Rubber Products Manufacturing	8.1%	3.7	1.1	10.2%	0.8	1.1
Nonmetallic Mineral Product Manufacturing	13.7%	6.2	8.5	23.6%	2.0	1.7
Primary Metal Manufacturing	-1.1%	n/a	n/a	6.0%	0.5	0.5
Fabricated Metal Product Manufacturing	1.6%	0.7	0.4	11.6%	1.0	0.9
Machinery Manufacturing	0.1%	0.0	n/a	10.7%	0.9	6.4
Computer and Electronic Product Manufacturing	4.2%	1.9	n/a	1.6%	0.1	0.1
Electrical Equipment, Appliance, and Component Manufacturing	-10.2%	n/a	n/a	-7.3%	n/a	n/a
Furniture and Related Product Manufacturing	-6.1%	n/a	n/a	4.1%	0.3	0.5
Miscellaneous Manufacturing	3.3%	1.5	n/a	11.2%	0.9	3.5

Table 11B: Wage Performance of Key Industry Subsectors in SVWDA

Industry and Subsector	1 yr. Wage Growth	Relative to Avg. Wage Growth in Region	Relative to Industry Wage Growth in State	5 yr. Wage Growth	Relative to Avg. Wage Growth in Region	Relative to Industry Wage Growth in State
Transportation and Warehousing						
Truck Transportation	2.0%	0.9	0.8	10.5%	0.9	0.9
Transit and Ground Passenger Transportation	8.3%	3.7	1.9	42.1%	3.5	2.8
Pipeline Transportation	1.9%	0.8	n/a	24.6%	2.1	1.6
Support Activities for Transportation	1.1%	0.5	n/a	-55.2%	n/a	n/a
Couriers and Messengers	-1.0%	n/a	n/a	-0.9%	n/a	n/a
Warehousing and Storage	6.4%	2.9	n/a	15.4%	1.3	1.6

Finally, Table 11C provides data on other performance metrics for the subsectors within SVWDA's identified key employment sectors. As these data show, in regard to:

- Location Quotient for Employment: the industry subsectors with the largest relative employment footprint in SVWDA in the second quarter of 2016 were: *Construction of Buildings* (1.2) in *Construction*; *Nursing and Residential Care Facilities and Hospitals* (1.4) in *Health Care*; *Food Manufacturing* (5.8) and *Printing and Related Support Activities* (4.9) in *Manufacturing*; and *Warehousing and Storage* (3.1) and *Truck Transportation* (2.2) in *Transportation and Warehousing*.
- Location Quotient for Establishments: the industry subsectors with the largest relative establishment footprint in SVWDA in the second quarter of 2016 were: *Construction of Buildings* and *Specialty Trade Contractors* (1.3) in *Construction*; *Nursing and Residential*

Care Facilities and Hospitals (1.7) in Health Care; Plastics and Rubber Products Manufacturing (3.0), Primary Metal Manufacturing (2.9), and Petroleum and Coal Products Manufacturing (2.7) in Manufacturing; and Warehousing and Storage (2.1) and Truck Transportation (1.9) in Transportation and Warehousing.

- Industry Output as a Percentage of Regional Output: the industry subsectors that accounted for the largest percentage of regional output in SVWDA in the second quarter of 2016 were: *Construction of Buildings, Heavy and Civil Engineering Construction, and Specialty Trade Contractors (7.0 percent) in Construction; Hospitals (2.9 percent) in Health Care; Food Manufacturing (11.7 percent) in Manufacturing; and Truck Transportation (1.9 percent) in Transportation and Warehousing.*
- Proportion of Industry Output Exported: the industry subsectors that exported the largest percentage of their output in SVWDA in the second quarter of 2016 were: *Construction of Buildings, Heavy and Civil Engineering Construction, and Specialty Trade Contractors (3.4 percent) in Construction; Nursing and Residential Care Facilities (17.4 percent) in Health Care; Primary Metal Manufacturing (98.4 percent), Furniture and Related Product Manufacturing (98.1 percent), and Computer and Electronic Product Manufacturing (98.0 percent) in Manufacturing; and Warehousing and Storage (59.9 percent) in Transportation and Warehousing.*
- Industry Exports as a Percentage of Regional Exports: the industry subsectors that accounted for the largest percentage of regional exports in SVWDA in the second quarter of 2016 were: *Construction of Buildings, Heavy and Civil Engineering Construction, and Specialty Trade Contractors (0.6 percent) in Construction; Hospitals (0.7 percent) in Health Care; Food Manufacturing (26.5 percent) in Manufacturing; and Warehousing and Storage (1.7 percent) in Transportation and Warehousing.*
- Type 1 Multiplier Ratio (Multiplier): the major industry sectors with the largest relative economic impact on SVWDA in the second quarter of 2016 were: *Construction of Buildings, Heavy and Civil Engineering Construction, and Specialty Trade Contractors (1.4) in Construction; Ambulatory Health Care Services and Hospitals (1.2) in Health Care; Food Manufacturing (1.5), and Wood Product Manufacturing and Nonmetallic Mineral Product Manufacturing (1.4) in Manufacturing; and Warehousing and Storage (1.4) in Transportation and Warehousing.*

Table 11C: Other Performance of Key Industry Subsectors in SVWDA

Industry and Subsector	LQ Emp.	LQ Est.	% of Regional Output	Industry Output Exported	% of Regional Exports	Type 1 Mult.
Construction						
Construction of Buildings	1.2	1.3	7.0%	3.4%	0.6%	1.4
Heavy and Civil Engineering Construction	0.4	0.9	7.0%	3.4%	0.6%	1.4
Specialty Trade Contractors	1.0	1.3	7.0%	3.4%	0.6%	1.4
Health Care						
Ambulatory Health Care Services	0.8	1.0	2.5%	5.3%	0.3%	1.2
Hospitals	1.4	0.7	2.9%	9.5%	0.7%	1.2
Nursing and Residential Care Facilities	1.4	1.7	0.9%	17.4%	0.4%	1.1
Manufacturing						
Food Manufacturing	5.8	2.6	11.7%	85.0%	26.5%	1.5
Beverage and Tobacco Product Manufacturing	1.4	1.3	1.8%	89.4%	4.2%	1.2
Wood Product Manufacturing	1.8	2.1	1.0%	79.1%	2.1%	1.4
Paper Manufacturing	1.9	1.4	1.2%	84.9%	2.8%	1.2
Printing and Related Support Activities	4.9	1.4	1.2%	68.3%	2.2%	1.3
Petroleum and Coal Products Manufacturing	3.2	2.7	0.3%	77.1%	0.6%	1.2
Chemical Manufacturing	2.3	1.2	3.5%	95.7%	9.0%	1.2
Plastics and Rubber Products Manufacturing	4.1	3.0	3.0%	96.3%	7.8%	1.2
Nonmetallic Mineral Product Manufacturing	2.1	1.9	0.6%	65.2%	1.1%	1.4
Primary Metal Manufacturing	2.4	2.9	0.7%	98.4%	2.0%	1.2

Table 11C: Other Performance of Key Industry Subsectors in SVWDA

Industry and Subsector	LQ Emp.	LQ Est.	% of Regional Output	Industry Output Exported	% of Regional Exports	Type 1 Mult.
Fabricated Metal Product Manufacturing	2.4	1.8	1.9%	94.4%	4.8%	1.2
Machinery Manufacturing	1.8	1.5	1.5%	95.7%	3.9%	1.2
Computer and Electronic Product Manufacturing	0.9	0.9	0.4%	98.0%	1.0%	1.2
Electrical Equipment, Appliance, and Component Manufacturing	0.0	0.7	0.2%	90.2%	0.4%	1.2
Furniture and Related Product Manufacturing	1.2	1.9	0.3%	98.1%	0.7%	1.3
Miscellaneous Manufacturing	1.9	1.1	0.6%	95.9%	1.4%	1.3
Transportation and Warehousing						
Truck Transportation	2.2	1.9	1.9%	19.7%	1.0%	1.3
Transit and Ground Passenger Transportation	0.4	0.7	0.1%	17.5%	0.0%	1.3
Pipeline Transportation	1.4	1.0	0.0%	22.6%	0.0%	1.3
Support Activities for Transportation	0.4	1.0	n/a	n/a	n/a	n/a
Couriers and Messengers	1.2	1.4	0.3%	10.9%	0.1%	1.3
Warehousing and Storage	3.1	2.1	1.1%	59.9%	1.7%	1.4

In Short

Our analysis of the economic performance of each of SVWDA's major industry sectors has shown that the *Transportation and Warehousing* sector is high growth industry in terms of both employment and wages, and an industry that has a disproportionately large employment and establishment footprint within the region and is one of the region's significant export industries. In addition, the *Management of Companies and Enterprises* sector is a high growth industry within the region in terms of both employment and wages. While the region's *Manufacturing* sector has a disproportionately large employment and establishment footprint within the region and is the region's most significant export industry.

While our analysis of the industry subsectors within SVWDA's identified four key employment sectors has shown that several subsectors within the region's *Manufacturing* sector (i.e., *Petroleum and Coal Products Manufacturing; Nonmetallic Mineral Product Manufacturing; Electrical Equipment, Appliance, and Component Manufacturing; Food Manufacturing, and Paper Manufacturing*) are high growth industries in terms of employment and/or wages. In addition, several have disproportionately large employment and establishment footprints within the region and are very significant export industries.

All subsectors in the region's *Health Care* sector (i.e., *Nursing and Residential Care Facilities, Hospitals, and Ambulatory Health Care Services*) have also been shown to be high growth industries in terms of employment and/or wages. Finally, the majority of subsectors in the region's *Transportation and Warehousing* sector (i.e., *Couriers and Messengers, Pipeline Transportation, Support Activities for Transportation, Transit and Ground Passenger Transportation, and Warehousing and Storage*) have also been shown to be high growth industries in terms of employment and/or wages, have disproportionately large employment and establishment footprints within the region, and in some cases (e.g., *Warehousing and Storage*) are among the region's significant export industries.

Gaps Analysis

In this section, we compare the occupation-driven demand for graduates in SVWDA with the pipeline of graduates from regional postsecondary education institutions to identify areas of potential unmet need. The method used to accomplish this analysis is not new and has been successfully employed in earlier studies conducted in several states.

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Demand for Trained Workers

To project the occupation-driven demand for graduates we start with projections of occupational employment. According to the most recent sub-state occupational employment projections from the Virginia Employment Commission, between 2012 and 2022 SVWDA will experience approximately 7,947 job openings each year.⁶² Breaking this number down according to major occupational group shows that, the largest numbers of annual openings are projected to occur in: 1) *Food Preparation and Serving* occupations (1,099 per year), 2) *Sales and Related* occupations (931 per year), 3) *Office and Administrative Support* occupations (914 per year), 4) *Transportation and Material Moving* occupations (601 per year), and 5) *Education, Training, and Library* occupations (560 per year). The numbers for these major occupation groups and all others are graphically displayed in Figure 25.

⁶¹ Similar methods are used in at least nine states (California, Georgia, Idaho, Illinois, New Jersey, Tennessee, Texas, Utah, and Virginia) to project anticipated education and training demands. For an excellent exposition of this method see, William J. Drummond and Jan L Youtie, "Occupational Employment, Demand for College Graduates, and Migration: A Statewide View," a report to the Board of Regents, University System of Georgia, 1999. For an example of how this method has been used previously in Virginia see, A. Fletcher Mangum, "System-Wide Needs Assessment for Virginia Education," State Council of Higher Education for Virginia, March 28, 2002, p.90.

⁶² *Data Source:* Virginia Employment Commission, "2012 to 2022 Substate Occupational Employment Projections."

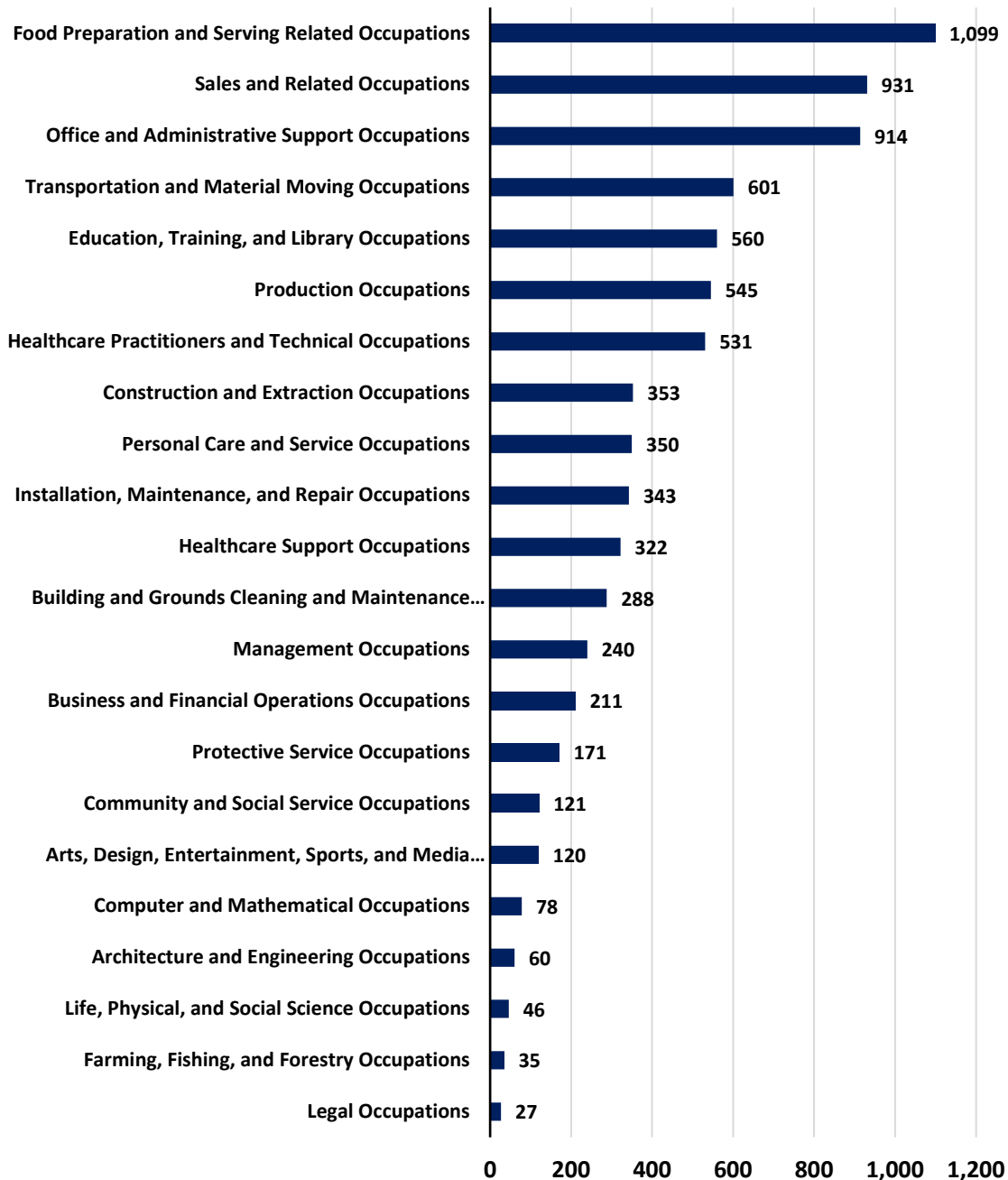


Figure 25: Projected Average Annual Openings in SVWDA by Major Occupation Category – 2012 to 2022⁶³

⁶³ Data Source: Virginia Employment Commission, “2012 to 2022 Substate Occupational Employment Projections.”

In the next step of the process, we use a crosswalk developed by the National Crosswalk Service Center to “map” occupations into the specific education and training program(s) necessary for entry into that occupation.⁶⁴ Through this process, we are able to use the occupational projections for SVWDA to estimate the occupation-driven demand for postsecondary education graduates within SVWDA.⁶⁵

Supply of Graduates

To estimate the likely supply of graduates within those education and training programs identified in the demand analysis, we use 2014-15 completions data from the National Center for Education Statistics’ IPEDS Data Center for all colleges and universities within SVWDA’s service area.⁶⁶

⁶⁴ The National Crosswalk Service Center (NCSC) is funded by the U.S. Department of Labor, Employment and Training Administration. The specific NCSC crosswalk used in this analysis is the *2010 Standard Occupational Classification Crosswalk to 2010 Classification of Instructional Programs*. This crosswalk identifies the prerequisite instructional programs (classified according to the National Center for Educational Statistics’ *2010 Classification of Instructional Program*, or *CIP*, code) necessary for employment in 1,364 specific occupations (classified according to the Bureau of Labor Statistics’ *2010 Standard Occupational Classification*, or *SOC*, code). Often, these are many-to-many relationships where a given instructional program can serve as an avenue into one of many jobs, or one of several instructional programs can serve as a prerequisite for a given job.

⁶⁵ More formally, the demand for education and training programs is calculated as:

$$DCIP_i = \sum Dcip_{ji}$$

Where,

$$Dcip_{ji} = (SOC_j)(GCIP_i / \sum GCip_{ij})$$

and,

$DCIP_i$ = the annual demand for instructional program i

$\sum Dcip_{ji}$ = the annual demand for instructional program i across all occupation(s) j

SOC_j = the projected annual openings for occupation j

$GCIP_i$ = SVWDA graduates from instructional program i

$\sum GCip_{ij}$ = SVWDA graduates from all instructional program(s) i related to occupation j

⁶⁶ More specifically, these data capture degree and certificate completions in 2014-15 from Blue Ridge Community College, Bridgewater College, Eastern Mennonite University, James Madison University, Lord Fairfax Community College, Mary Baldwin College, Shenandoah University, Southern Virginia University, Virginia Military Institute, Washington and Lee University, and the Wilson Workforce and Rehabilitation Center.

Caveats

In interpreting the results of this analysis, it is important to keep the following caveats in mind:

- Some multi-campus postsecondary education institutions report enrollment and completion data to the IPEDS Data Center through their main campus only. As a practical matter, this means that all enrollments and completions from all of the institution's campuses are reported "as if" they were at the main campus. As a result, completers from the satellite campuses of postsecondary institutions that do not have their main campus in the SVWDA service area may not be included in the assessment of the pipeline of regional graduates.
- Postsecondary institutions do not report completions from non-credit or specialized workforce training classes to the IPEDS Data Center. As a result, completers from these classes may not be included in the assessment of the pipeline of regional graduates.
- For these reasons, the training "gaps" identified in Tables 12 through 17 are correctly viewed as potential shortfalls in the regional pipeline of trained workers. They identify areas where there may be an insufficient supply or programs and program graduates within the region, and where further conversations with businesses and education/training providers may be necessary.

Percentage of Regional Need Met

Table 12 details the results obtained from a comparison of the occupation-driven demand for graduates in SVWDA with the pipeline of completers from regional postsecondary education institutions, for those occupations exhibiting the largest absolute gaps between demand and supply. These estimates take into account the fact that the relationship between occupations and their associated training programs can often be a many-to-many relationship. As these data show, the largest gaps were shown to be for: Nursing Assistants; Teacher Assistants; Industrial Machinery Mechanics; Licensed Practical and Licensed Vocational Nurses; Medical Assistants; Electricians; Child Care Workers; First-Line Supervisors of Construction Trades and Extraction; Dental Assistants; and Real Estate Sales Agents.

In this Table:

- Occupation – is the title of the selected occupation
- Avg. Annual Open. – is the estimated number of average annual openings in this occupation in SVWDA between 2012 and 2022.
- Degree Req. – is the most commonly associated degree level for individuals employed in the selected occupation.
- Cert. – is the number of individuals who completed a certificate program in SVWDA in the 2014-15 academic year that is necessary for entry into the selected occupation.
- Assoc. – is the number of individuals who completed a two-year Associate's program in SVWDA in the 2014-15 academic year that is necessary for entry into the selected occupation.
- BA – is the number of individuals who completed a four-year Bachelor's program in SVWDA in the 2014-15 academic year that is necessary for entry into the selected occupation.
- MA – is the number of individuals who completed a Master's program in SVWDA in the 2014-15 academic year that is necessary for entry into the selected occupation.
- Doc – is the number of individuals who completed a doctoral (Ph.D.) or first professional program (*e.g.*, J.D.) in SVWDA in the 2014-15 academic year that is necessary for entry into the selected occupation.
- Total – is the total pipeline of individuals who completed postsecondary programs that are necessary for entry into the selected occupation in SVWDA in the 2014-15 academic year.
- Gap – is the difference between the number of annual openings, and the pipeline of qualified regional graduates, associated with the selected occupation.
- % of Need Met – is the percentage of the annual demand for qualified workers in the selected occupation that is met by graduates from associated regional postsecondary education programs.

Table 12: Top Areas of Unmet Regional Need⁷³

Occupation	Avg. Annual Open.	Degree Req.	Cert.	Assoc	BA	MA	Doc	Total	Gap	% of Need Met
Nursing Assistants	126	HS	10					10	116	8%
Teacher Assistants	60	Some College						0	60	0%
Industrial Machinery Mechanics	45	Cert						0	45	0%
Licensed Practical and Licensed Vocational Nurses	76	Cert	34					34	42	45%
Medical Assistants	32	Cert						0	32	0%
Electricians	32	Cert	3					3	29	10%
Childcare Workers	49	HS	16	5				21	28	43%
First-Line Supervisors of Construction Trades and Extraction	35	HS	8					8	27	22%
Dental Assistants	24	Cert						0	24	0%

⁶⁷ These estimates take into account the fact that the relationship between occupations and their associated training programs can often be a many-to-many relationship. As a result, to avoid double counting it is sometimes necessary to “allocate” graduates across the multiple occupations associated with a given training program. The method we use to do this is to apportion graduates based on the relative number of annual openings associated with each occupation.

Table 12: Top Areas of Unmet Regional Need⁷³

Occupation	Avg. Annual Open.	Degree Req.	Cert.	Assoc	BA	MA	Doc	Total	Gap	% of Need Met
Real Estate Sales Agents	21	HS	1					1	20	5%
Middle School Teachers, Except Special and Career/Technical	48	BA	2		17	9	2	29	19	60%
Machinists	19	Cert						0	19	0%
Medical Secretaries	19	Some College						0	19	0%
Computer User Support Specialists	18	BA						0	18	0%
Insurance Sales Agents	17	BA						0	17	0%
Library Technicians	15	BA						0	15	0%
Preschool Teachers, Except Special Education	15	Some College						0	15	0%
Dental Hygienists	14	Assoc						0	14	0%
Hairdressers, Hairstylists, and Cosmetologists	30	Cert	16					16	14	53%
First-Line Supervisors of Personal Service Workers	13	BA						0	13	0%

Table 12: Top Areas of Unmet Regional Need⁷³

Occupation	Avg. Annual Open.	Degree Req.	Cert.	Assoc	BA	MA	Doc	Total	Gap	% of Need Met
Electronic Home Entertainment Equipment Installers and Repairers	13	Cert						0	13	0%
Veterinarians	13	Doc						0	13	0%
Rehabilitation Counselors	13	MA						0	13	0%
Radiologic Technologists	12	Assoc						0	12	0%
Physical Therapist Assistants	11	Assoc						0	11	0%
Massage Therapists	11	Cert						0	11	0%
Librarians	11	MA						0	11	0%
Industrial Engineers	10	BA						0	10	0%
Social and Human Service Assistants	10	BA						0	10	0%
Medical and Clinical Laboratory Technologists	9	BA						0	9	0%

In Short

Our assessment of potential gaps between the occupation-driven demand for graduates in SVWDA, and the pipeline of graduates from regional postsecondary education institutions, shows that the largest shortfalls of trained workers are likely to occur in the following occupations: Nursing Assistants; Teacher Assistants; Industrial Machinery Mechanics; Licensed Practical and Licensed Vocational Nurses; Medical Assistants; Electricians; Child Care Workers; First-Line Supervisors of Construction Trades and Extraction; Dental Assistants; and Real Estate Sales Agents.

Conclusion

This report has provided an assessment of the state of the workforce in the Shenandoah Valley Workforce Development Area (SVWDA). That assessment has shown that SVWDA has enjoyed steadily rising employment over the last five years and almost all of that growth was driven by the private sector. More specifically, the largest increases in private sector employment over this period occurred in the *Health Care and Social Assistance* (up 2,513 jobs), *Transportation and Warehousing* (up 2,217 jobs), and *Accommodation and Food Services* (up 1,889 jobs) sectors.

With regard to the structure of the regional economy, our analysis has shown that SVWDA is heavily dependent on the *Manufacturing* sector. At 31,718 jobs in the second quarter of 2016, *Manufacturing* was SVWDA's largest employment sector that quarter and its 5th highest paying at \$963 per week. The region's second largest employment sector was *Healthcare and Social Assistance* (27,532 jobs and 9th highest paying at \$858 per week), and *Retail Trade* was the region's third largest employment sector (26,741 jobs and 17th highest paying at \$488 per week).

From a demographic perspective, our analysis has shown that overall population growth in SVWDA between 2000 and 2015 was comparable to the statewide norm. And, just as at the statewide level, that population growth was driven by increases the region's 65 and older population. Moreover, in SVWDA that population shift was further exacerbated by absolute losses in the regions 19 and under population. In addition, population growth in SVWDA between 2000 and 2015 was disproportionately driven by the region's Hispanic and Asian populations.

As part of our assessment, we also evaluated the economic performance of each of SVWDA's major industry sectors. That evaluation showed that SVWDA's *Transportation and Warehousing* sector is high growth industry in terms of both employment and wages, and an industry that has a disproportionately large employment and establishment footprint within the region and is one of the region's significant export industries. In addition, the *Management of Companies and Enterprises* sector is also high growth industry within the region in terms of both employment and wages. While SVWDA's *Manufacturing* sector has a disproportionately large employment and establishment footprint within the region and is the region's most significant export industry.

In addition to evaluating the performance of SVWDA's major industry sectors, we also evaluated the economic performance of subsectors within four key industry sectors – *Construction, Health Care, Manufacturing, and Transportation and Warehousing* – that have been identified by SVWDA personnel as key regional employment sectors. That evaluation showed that several subsectors within the region's *Manufacturing* sector (i.e., *Petroleum and Coal Products Manufacturing; Nonmetallic Mineral Product Manufacturing; Electrical Equipment, Appliance, and Component Manufacturing; Food Manufacturing, and Paper Manufacturing*) are high growth industries in terms of employment and/or wages. In addition, several of these subsectors also have disproportionately large employment and establishment footprints within the region and are very significant export industries.

Our evaluation also showed that all subsectors in the region's *Health Care* sector (i.e., *Nursing and Residential Care Facilities, Hospitals, and Ambulatory Health Care Services*) qualify as high growth industries in terms of employment and/or wages. While the majority of subsectors in the region's *Transportation and Warehousing* sector (i.e., *Couriers and Messengers, Pipeline Transportation, Support Activities for Transportation, Transit and Ground Passenger Transportation, and Warehousing and Storage*) also qualify as high growth industries in terms of employment and/or wages, have disproportionately large employment and establishment footprints within the region, and in some cases (e.g., *Warehousing and Storage*) are among the region's most significant export industries.

Finally, our assessment of potential gaps between the occupation-driven demand for graduates in SVWDA, and the pipeline of graduates from regional postsecondary education institutions, has shown that the largest shortfalls of trained workers are likely to occur in the following occupations: Nursing Assistants; Teacher Assistants; Industrial Machinery Mechanics; Licensed



Practical and Licensed Vocational Nurses; Medical Assistants; Electricians; Child Care Workers; First-Line Supervisors of Construction Trades and Extraction; Dental Assistants; and Real Estate Sales Agents.

In sum, SVWDA is a region that has experienced steady employment growth, remains heavily dependent upon its *Manufacturing* sector, but is also experiencing significant employment and wage growth in other key areas such as *Transportation and Warehousing* and *Health Care*.